

Master TRANSPORTATION PLAN

PENNINGTON COUNTY



APRIL 2024

Pennington County, South Dakota

MASTER TRANSPORTATION PLAN

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The preparation of this report has been financed in part through grant(s) from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 and Metropolitan Planning Program, Section 104(f) of Title 23, U.S. Code. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

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Definition of Acronyms

AADT – Average Annual Daily Traffic

AFB – Air Force Base

ADA – Americans with Disabilities Act

ATV – All Terrain Vehicle

BIG – Bridge Improvement Grant

CIP – Capital Improvement Plan

EAFB – Ellsworth Air Force Base

FAA – Federal Aviation Administration

FAST Act – Fixing America’s Surface Transportation Act

FC – Functional Classification

FHWA – Federal Highway Administration

GIS – Geographic Information System

MTP – Master Transportation Plan

MUTCD – Manual on Uniform Traffic Control Devices

PC – Pennington County

PCI – Pavement Condition Index

PIM – Public Input Meeting

RAISE – Rebuilding American Infrastructure with Sustainability and Equity

RAP – Rapid City Regional Airport

RCAMPO – Rapid City Area Metropolitan Planning Organization

RSA – Road Safety Audit

RTS – Rapid Transit System

SAT- Study Advisory Team

SD – South Dakota

SDDOT – South Dakota Department of Transportation

STIP – Statewide Transportation Improvement Program

TMC – Turning Movement Counts

TIP – Transportation Improvement Program

UTV – Utility Terrain Vehicle

CHAPTER 1 – INTRODUCTION

BACKGROUND

Pennington County is the second-most populated and second-largest county in South Dakota. It contains various geographies, from rugged forests and gullies, to rolling hills and flat farmlands. Pennington County (PC) is a large county containing 2,783 square miles (about twice the area of Rhode Island) of land, serving 14 incorporated communities, as well as significant tourism. The County Highway Department is responsible for approximately 874 miles of roads and 126 bridges and culverts.

Pennington County, like many US counties with rural and growing urbanized areas, has seen an increase in vehicular traffic and other modes of travel. Increased travel by walkers, bicyclists, and All Terrain Vehicle (ATV)/Utility Terrain Vehicles (UTV) are putting more pressure to have wider shoulders on roads and improved sidewalks, paths, and trails. This Master Transportation Plan (MTP) considers what types of facilities make the most sense for the County, how costs and implementation can be addressed, and finally, identifies both short- and long-range County project priorities.

PURPOSE

The purpose of the 2024 MTP is to correlate growth to future transportation system needs. KIJ completed work on the previous Master Transportation Plan in 2012. Since that time, and especially in the past eight years to 2020, County staff has noted that there have been significant changes within the County regarding demographics. Recent growth and development of residential and other infrastructure has resulted in increasing demands on the County's transportation system and its maintenance.

County Highway Department staff noted that there has been an increase in residents from out of state/outside the region in the last three years since the global pandemic. Also, the addition of the B-21 Raider at Ellsworth Air Force base (EAFB) is anticipated to bring a significant influx of public and private workforce and new residents to EAFB and the County.

Based on these and other factors, the County has requested an updated MTP that addresses current transportation issues and develops a long-range plan that effectively provides guidance for the County's future transportation demands and maintenance responsibilities.

Providing an MTP that is responsive to new development and changing conditions within the County is at the heart of why this MTP is needed. This MTP can certainly place Pennington County in the best position to provide direction for County projects, policies, and development proposals that support a strong transportation system.

TRANSPORTATION VISION

Vision:

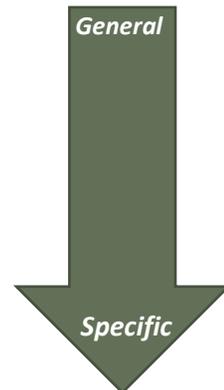
- Aspirational statement outlining a desired future.

Goals:

- Broad statements that describe a desired end state
- Represent key priorities.
- Visionary in nature

Strategies

- Specific actions → support the achievement of goals.



The transportation vision will anchor future development of the Pennington County transportation system. **The transportation vision is as follows:**

Pennington County will develop a transportation system that incorporates high network connectivity, supports commerce, and provides efficient, safe, and dependable mobility for people and goods. The transportation system will be a driving force for the County's growth and prosperity, supporting livable and vibrant communities that serve existing residents while creating an attractive environment for investment, tourism, and new residents.

OBJECTIVES

What transportation needs exist in Pennington County?

Key to generating a practical and useful MTP for Pennington County is a comprehensive understanding of the current and future transportation issues and needs. KLJ began the MTP process by asking Pennington County Highway and Planning department leadership the following questions during the SAT (Study Advisory Team) 1 kickoff meeting.

- What are the most important steps the County can take to improve their transportation system?
- Is travel to/from certain locations difficult because of road conditions or capacity?
- What routes could be added to make travel easier?
- What routes could be improved?
- Does bicycle/pedestrian travel feel convenient and safe?
- What are the issues and needs surrounding ATV/UTV use on County roads?
- Do current transit services meet community needs?

From a discussion of the above questions, KLJ worked with the SAT to develop the following list of *Study Objectives*:

- Identify key urban and rural growth areas
- Coordinate Pennington County and RCAMPO road jurisdiction and functional classification discrepancies
- Use of Streetlight Data for origin/destination analysis
- Establish roadway surface and pavement management strategy
 - Establish policy/methodology for initiating gravel-to-pavement projects
 - Identify road maintenance areas of concern

- Analysis of existing and projected future Traffic Volumes
- Identify and address freight strategies where applicable as they pertain to roadway LOS, safety, volumes, and maintenance.
- Address multi-modal transportation concerns/considerations
 - UTV/ATV use and road maintenance analysis; develop policy
 - Pedestrian and Bicycle facilities inventory and needs analysis
 - Air Transportation considerations/analysis
 - Transit considerations/analysis
- Traffic Operations
 - Analyze intersections, intersection delays, and LOS
- Crash and Safety Analysis
- Traffic Impact Studies (TIS)
 - Develop Traffic Impact Study (TIS) requirements
 - Determine the level of growth that will warrant a TIS and analysis methods to allow consistent TIS development and review.

GOALS AND STRATEGIES

The following goals and strategies were defined by the SAT. These closely mirror some of the stated goals and strategies identified by the SDDOT’s 2022 annual report.

Safety	System Preservation	Mobility, Reliability, & Accessibility	Economic Vitality	Environmental Sustainability	Innovative Transportation Technologies
Incorporate safety and security throughout all modes, for all user	Preserve and maintain existing transportation system infrastructure	Optimize mobility and connectivity for minimal travel times and delays	Support industry and commerce through efficient movement of people and goods	Prioritize environmental stewardship in development and maintenance of the system	Introduce ITT technologies to reduce congestion, improve traffic management, and increase safety

PLANNING PROCESS AND APPROACH

The Pennington County MTP project was organized into five tasks.

Task 1, Baseline Conditions Analysis, began with comprehensive data collection and review of baseline conditions to identify current needs throughout the Pennington County transportation system.

Task 2, Standards Development, provides a policy framework for the transportation plan and provides the County with a set of tools to address future development and roadway improvements.

Task 3, Future Needs analysis, determined the anticipated influence of growth on the system, identifying projects needed to keep people moving into the future.

Task 4, Roadway Management System, details the development of roadway management designed to use existing pavement databases maintained by the County to aid in the management, construction, and maintenance of the transportation system.

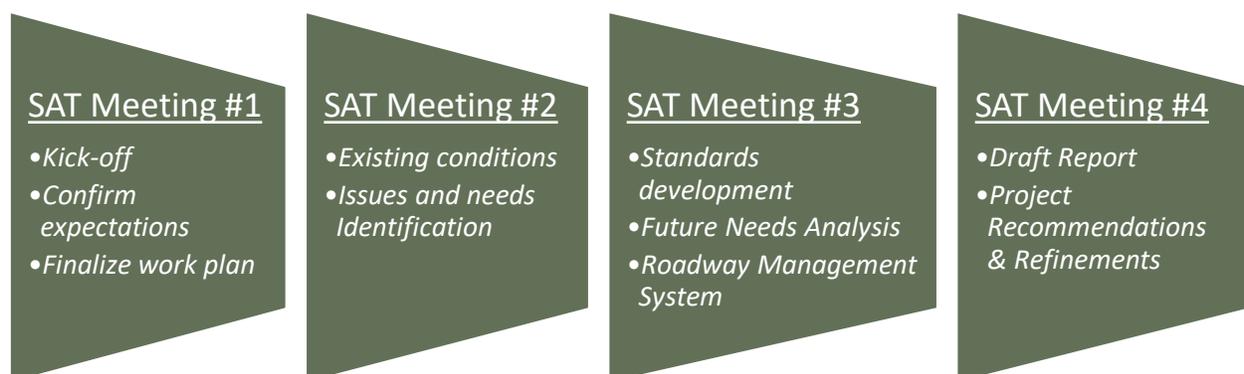
Task 5 provides the completion of this report, including a list of prioritized projects, programming costs, and policy guidelines.

Project coordination began in April of 2023 with a face-to-face project kickoff/SAT 1 meeting to confirm project goals and objectives and identify critical concerns for the project. Three more SAT meetings were held throughout the project, along with a series of meetings regarding the Roadway Management System development, which gave attendees an early look at the plan's components.

The first Public Input Meeting (PIM 1) was held in June of 2023 and provided all attendees with a forum to express their concerns about the transportation network. The second Public Input Meeting (PIM 2) was held in March 2024 and presented the project findings, projects, and draft MTP. Online material was provided to support the public involvement processes. The final MTP incorporated all input received.

Study Advisory Team

The MTP incorporated a series of four (4) Study Advisory Team (SAT) meetings that consisted of the following:



The SAT for the Pennington County MTP consisted of the following key representatives from county, state and federal agencies or departments:

- Brittney Molitor, Pennington County Planning Department
- Jason Theunissen, Pennington County Planning Department
- Eric Radke, Pennington County Highway Department
- Joe Miller, Pennington County Highway Department
- Sean Smith, Pennington County Highway Department
- Kip Harrington, Rapid City Area Metropolitan Planning Organization
- Sarah Gilkerson, South Dakota Department of Transportation
- Greg Heitmann, Federal Highway Administration

TRANSPORTATION SYSTEM OVERVIEW

A modern and efficient transportation system, with safety at the forefront, is essential to the overall quality of life and economic vitality of any populated geographic region. Pennington County's transportation system should be planned to enhance mobility of users across all modes of travel, including vehicles, pedestrians, bicycles, and public transit, as well as provide for an integrated transportation system that serves all members of the community.

The Pennington County Highway Department is currently responsible for 874 miles of unpaved and paved roads and 126 bridges. In addition to routine repair and maintenance, this responsibility includes snow removal operations and major reconstruction projects. County Highway Department staff coordinates with outside agencies within the County including Rapid City Public Works, the South Dakota Department of Transportation, and the cities of Box Elder Public Works, Hill City, Keystone, Wall, and New Underwood, among others. In some cases, the County contracts with County municipalities for services.

The County Highway Department reviews construction plans for subdivision road improvements and drainage in accordance with County Ordinance 14 and any other local, state, and federal law. Other responsibilities include the design, inspection and contract administration relating to new development projects, highways and bridges, traffic control and drainage facilities.

Common Services of the Highway Department include:

- Roadway (Re)Construction and Maintenance
 - Snow Removal
- Roadway Design
- Placement of Driveways
 - Approach Permits
- Storm Water Management
 - Drainage
- Signage

Study Area

The Pennington County study area is approximately 2,784 square miles, spanning west from the state of Wyoming's border and the Black Hills National Forest in the west, and running east approximately 100 miles through the Buffalo Gap National Grasslands to the border with Jackson County, SD.

The County study area is most easily differentiated by three main geographic areas: Central; Eastern Plains; and Black Hills.

Central Pennington

Located in the north-west central region of the county, *Central Pennington* consists of the Rapid City / Box Elder metropolitan area, as defined by the boundary of the Rapid City Area MPO boundary and including Ellsworth AFB. These urbanized areas play significant roles in recent growth and development occurring in Pennington County. This growth will require collaborative planning between the cities, County, and the Rapid City Area Metropolitan Planning Organization (RCAMPO) to provide transportation needs for all county residents, current and future.

Eastern Plains

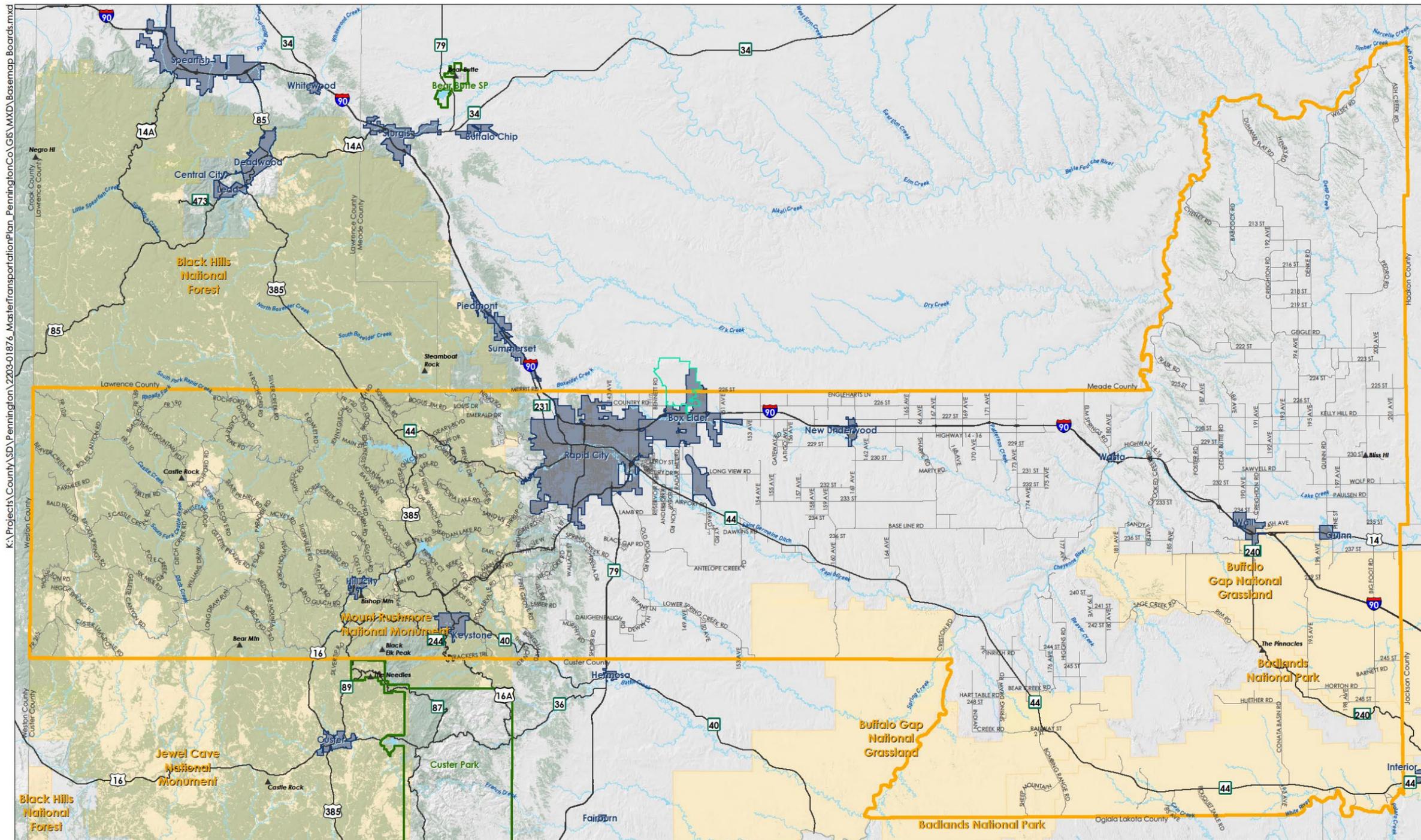
The Eastern Plains area comprises the eastern half of the county east of the MPO boundary and extending to the County line. The major County transportation facility in this area is Hwy 1416. Highway 44 is also a key east-west Pennington County roadway. The area contains four incorporated cities (New Underwood, Quinn, Wall, and Wasta) and a number of unincorporated communities. This Focus Area is also home to the tourism areas of Badlands National Park and Buffalo Gap National Grasslands. Due to the open land and unincorporated portions of the *Eastern Plains* there are opportunities to expand residential and some commercial surrounding existing communities, which will have implications for the County's future transportation needs.

Black Hills

The *Black Hills* area is defined as the portion of Pennington County that is west of the RCAMPO boundary, much of which lies within the Black Hills National Forest. Major Pennington County transportation facilities include Highways 16 and 44, which run primarily east west and connect the area into the Rapid City urban area. Highway 385 runs through the Black Hills areas in a north-south orientation. The area contains two incorporated cities (Keystone and Hill City) and several unincorporated communities.

Figure 1 on the next page graphically depicts the Pennington County Study Area

Figure 1. Pennington County Study Area Map



Pennington County Study Area

- Ellsworth AFB
- SD Parks and Recreation Areas
- US & State Highways
- Pennington County Boundary
- Bodies of Water
- County Roads & City Streets
- Incorporated Cities
- Federal Lands
- Rivers & Streams
- County Boundaries
- Notable Peaks

Source(s): SD GIS Data, SDGS, USGS



June 2023

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Roads

The transportation system in Pennington County supports conditions that allow for agricultural and heavy truck usage on highways and county roads, heavy tourism usage, and exposure to inclement weather conditions. The heavy usage places a burden on Pennington County roadway conditions. As a result, roadway maintenance is of major concern. Funding for road improvements and maintenance through a wheel tax were recently adopted in the last election in early 2023.

The transportation system within the borders of Pennington County is multijurisdictional and based on a functional classification system which includes US and State Highways, County Roads, Township Roads, Road Districts, City Streets, and other administrative roads such as US Forest Service maintained roads. Within all these jurisdictions, roads fall into a functional classification system that includes Principal Arterials, Minor Arterials, Major and Minor Collectors, and local roads and streets. Principal arterials contain the highest capacity traffic through Pennington County and include Interstate 90 (I-90), US Highway 16, US Highway 385, South Dakota Route (SD) 79, and SD 44. Maintenance and funding for non-county jurisdiction roads is provided through federal or state funding sources. Pennington County jurisdictional roads are maintained by the Pennington County Highway Department and receive funding from various local, MPO, state, and Federal sources.

In addition to County-maintained roads, there are 143 road districts in Pennington County. Road districts are established by landowners where local taxes can be used within their district's jurisdiction to maintain District Roadways. The county has also used Tax Increment Financing Districts for economic development projects to provide a financing tool for public infrastructure and public amenities.

Tourism and Visitor Traffic

In Pennington County, April to October is tourism season whereby there is a marked increase in transportation demands at the Rapid City Regional Airport (RCRA) and on county roadways providing access to key attractions such as Mount Rushmore, and the nearby summertime motorcycle rally in Sturgis, SD. Additionally, the county experiences significant visitor traffic outside the tourism season, such as hunting, fishing, hiking, snowmobiling, and other outdoor activities.

Scenic Byways

In Pennington County, the only State Scenic Byway is the 68-mile Peter Norbeck Scenic Byway located in the Black Hills, just south of Keystone and Hill City. The State Scenic Byways Program recognizes those roadways which exhibit the State's unique character and beauty. Individuals, organizations, and local governments can identify roadways with distinctive qualities and nominate them for State Scenic Byway designation. Routes which display scenic, cultural, geologic, wildlife habitat, or other aesthetic features are eligible for consideration.

Multi-Modal Transportation

ATV/UTV, Non-Motorized (Pedestrian and Bicycle)

Pennington County does not own or maintain any sidewalks, trails, or bike routes, but there are existing and proposed bike routes and trails in Rapid City. The US Forest Service owns and maintains trails throughout the Black Hills National Forest (e.g., Centennial Trail) and The South Dakota Game, Fish and Parks manages the Mickelson Trail. In rural and unincorporated Pennington County, bicyclists have a

propensity to use roadways or road shoulders (some of which do not have adequate shoulder width) for recreation and commuting.

Transit

Pennington County does not provide for or participate in any provision of public transit services. All existing public transportation within Pennington County is provided by public services agencies such as Rapid Transit System (RTS) and/or other on-demand services provided by incorporated municipalities. Rapid City is serviced by three public transit services: Rapid Transit System's Rapid Ride, Dial-A-Ride, and City View Trolley that provide more than 400,000 annual passenger trips.

Airports and Heliports

Pennington County has two public use airports, one Air Force base and multiple private heliports that are used for health care or sightseeing operations.

The community of Rapid City serves as a regional commercial and business hub for tourism hot spots and surrounding agricultural uses. Significant contributors to increases in airport use and passenger enplanements include thriving health care, finance, and agriculture industries, along with travel related to EAFB, and growth in tourism.

Rapid City Regional Airport (RAP) sits on 1,720 acres of land nine miles east of the Rapid City Central Business District. The airport used to be co-located at the Rapid City Army Air Base that is now known as Ellsworth Air Force Base. Since 1950 the airport has been owned and operated by the City of Rapid City and has expanded to accommodate the aviation needs of the community and Black Hills region including a terminal building in 1989 with an expansion and renovation in 2013.

Wall Municipal Airport (6V4) is a general aviation airport immediately west of the City of Wall. The airport has two runways. The airport is completing a major reconstruction of its primary runway through summer 2023.

Ellsworth Air Force Base (RCA) is located north of the City of Box Elder and is operated by the U.S. Air Force for the purpose of national defense. It is not open to the public but the air traffic controllers at the Ellsworth provide Approach and Departure control for the area included RAP, RCA, and other airports in the vicinity during the day.

There are three Private Heliports in Pennington County used for sightseeing activity: Rushmore Heliport (SD42); Keystone Heliport (SD18); and Badlands Heliport (SD69). Additionally, there is one medical heliport located at Monument Health Rapid City Hospital.

CHAPTER 2 – PUBLIC ENGAGEMENT

INTRODUCTION

The public involvement for phase one (1) consisted of identifying needs and desires of the community for the development of the Pennington County MTP.

STAKEHOLDERS

Stakeholders included in KLJ's public engagement outreach efforts included the following:

- Ellsworth Air Base
- Rapid Transit
- EMS Services
- Cities of Rapid City, Wall, Hill City
- Other surrounding communities

METHODS AND ACTIVITIES

Efforts were made to provide ample opportunities for the public and stakeholders to provide input with, three (3) public meetings in communities throughout Pennington County, a project website to serve as an information hub for the public, and targeted advertising with newspaper and social media.



PUBLIC INPUT MEETINGS (PIMS)

On June 13, 14, and 15, 2023, three consecutive round one PIMs were held, followed by three consecutive round two PIMs held on March 12, 13, and 14, 2024. Both rounds were held at each of the three unique locations:

- Rapid City on June 13 and March 12
- Wall on June 14 and March 13
- Hill City on June 15 and March 14

Advertising for each public meeting consisted of public notices in area newspapers (Rapid City Journal, Wall Courant, and Hill City Prevalier News), targeted social media, and press releases.

Two targeted social media advertising campaigns on Facebook/Instagram and were distributed on social media for PIM #1 and PIM #2. An open house meeting format was offered prior to and after the formal presentation at each of the three PIM #1 and PIM #2 meeting locations. Board displays of the County were available for viewing and discussion. Staff were available to discuss specific concerns attendees had, both prior to and after the formal presentation.

The PIM #1 presentation covered baseline conditions, including traffic, crash data, road surface conditions, functional classification, transit service, vision, goals, and objectives. Attendees were directed to provide comments verbally, through a printed comments sheet, via email, and the website.

After each of the three PIM #1 formal presentations were completed, members of the public joined staff for informal open house meeting format discussion.

At each of the three PIM #1 and PIM #2 meeting project presentations, the project was reviewed followed by members of the public joining staff for informal open house meeting format discussion where public feedback was documented and incorporated into the MTP.

Overall, feedback addressed the fact that Pennington County highways are primarily rural sections, meaning that no curb, gutter, or sidewalk is typically provided along County highways. Individuals seeking to travel on foot or bicycle on rural county roads typically walk along the edge of the roadway or if available, within the road shoulder width. This condition was reflected in the survey responses, as a number of individuals requested additional sidewalks or pedestrian/bicycle facilities along County highways.

Responses included a request for a walkable connection between Wall and Quinn and sidewalks along Deadwood Avenue. Pedestrian improvement projects were rated second-highest in importance by survey respondents, slotting just below existing road improvements. A majority of survey respondents gave “travel by bicycling or walking” in Pennington County a poor rating.

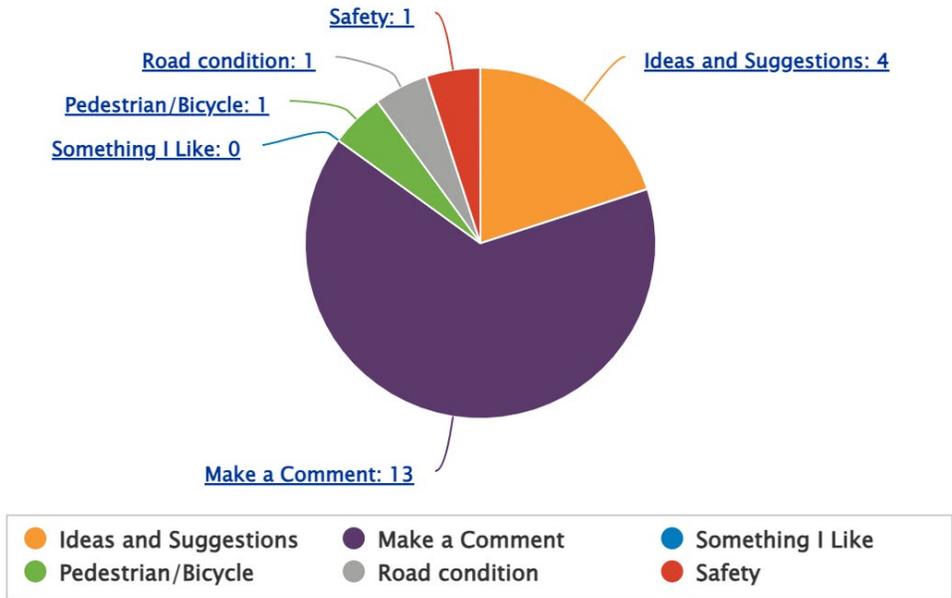
Meeting attendance, discussion items, and comments collected from each meeting are detailed in Appendix A.

The screenshot shows a Facebook post from KLJ Engineering, a sponsored post. The text of the post reads: "Join us for a public meeting for Pennington County's Master Transportation Plan. This multi-modal plan needs your input as we prepare for the future transportation needs of the county. Please join us on June 14 from 5:30- 7 pm at the Wall Community Center or follow the link below for additional information and opportunities." Below the text is a video player with a thumbnail image. The thumbnail features the Pennington County logo, the title "MASTER TRANSPORTATION PLAN", and icons for a pedestrian, a bicycle, a truck, and a car. It also specifies the date and time: "PUBLIC MEETING June 14 5:30-7 PM" and the location: "Wall Community Center". Below the video player is a link "bit.ly/penncomtp" and a "Learn more" button. At the bottom of the post, it shows "1 share" and icons for "Like", "Comment", and "Share".

**WEBSITE:
INTERACTIVE
ISSUES MAP
ENGAGEMENT
RESULTS**

The project website’s interactive map inputs were collected in which people left comments on a range of topics including “Safety, Road conditions, Ped/Bike, ‘Something I like’, Ideas & Suggestions, and ‘Other’.” The site saw a total of 415 visitors with a total of 20 comments left on the map.

Category Totals



CHAPTER 3 – EXISTING BASELINE CONDITIONS

INTRODUCTION

The baseline conditions analysis provides a multi-modal comprehensive inventory of the state of existing transportation facilities within Pennington County. The analysis of the existing transportation network will help Pennington County officials to understand the system’s current strengths, weaknesses, and opportunities for improvement. Similarly, evaluation of population totals, distributions, and historical growth trends is necessary to anticipate where transportation investment can best support future development.

The Baseline Conditions Chapter presents an inventory of data associated with Pennington County’s existing transportation system and its users. This inventory considers the physical condition of the roadways as well as its operations and maintenance. The following sections are included in this chapter:

- Population
- Future Growth Areas
- Roadway
- Multi-modal Transportation
- Existing Transportation Policy and Ordinances
- Baseline Conditions Summary: Issues and Needs

POPULATION

Existing

Pennington County is the second most populated county in South Dakota with a 2021 population of 112,000 residents. Rapid City, population 79,989 (2023) is the largest city in Pennington County and also houses the Metropolitan Planning Organization (MPO) for the Rapid City urbanized area.

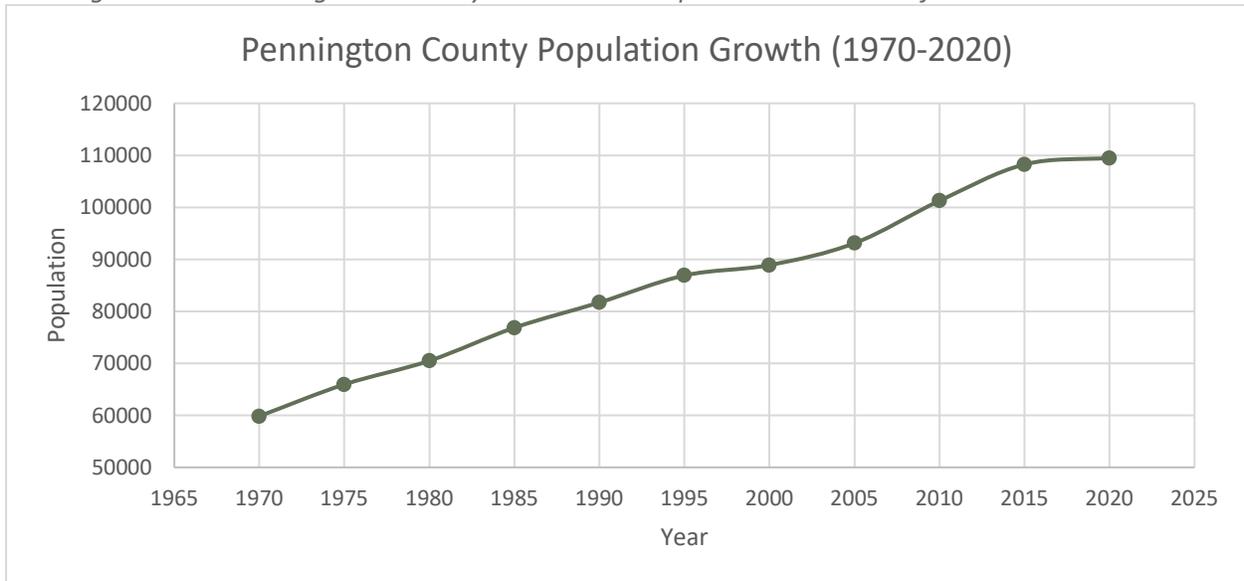
Table 1 - Population Growth Rate from 2010 to 2021

State County	2010	2021	Growth
South Dakota	816,000	895,500	9.70%
Minnehaha	170,000	199,700	17.50%
Pennington	101,250	112,000	10.40%
Lincoln	45,200	67,900	50.20%
Brown	36,700	38,100	3.90%
Brookings	32,000	34,650	8.20%
Meade	25,500	30,175	18.40%
Lawrence	24,200	26,200	8.10%

Population trends

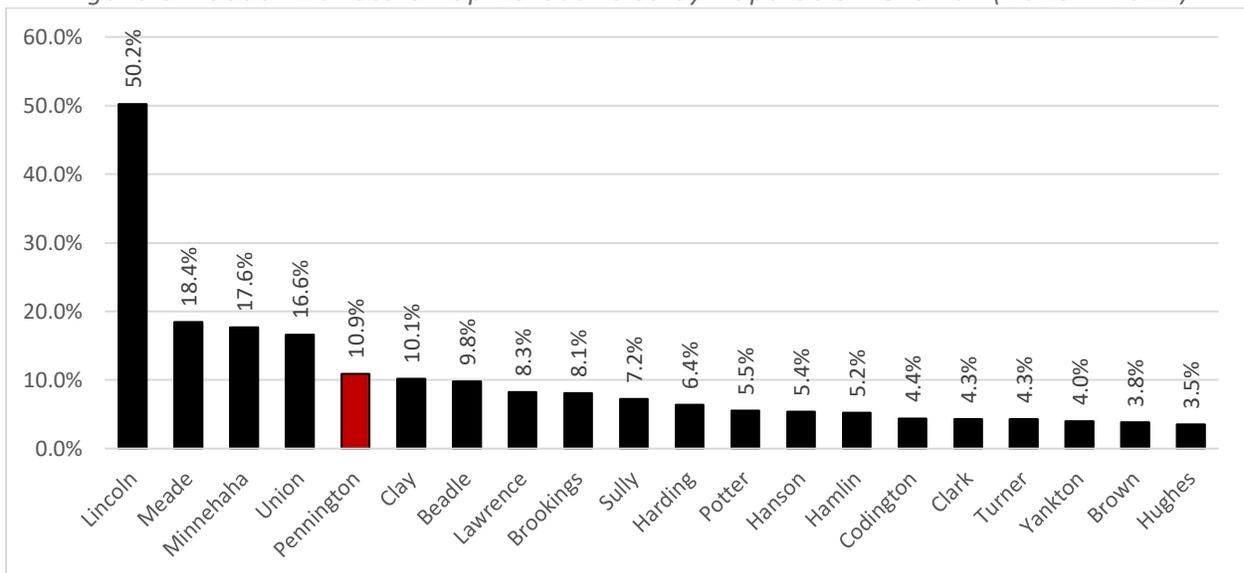
Pennington County has experienced a 10.4% increase in population from 2010 to 2021. Figure 2 graphically displays the past five decades of growth.

Figure 2 – Pennington County Historical Population Growth from 1970 to 2020



South Dakota’s top 20 counties by population growth during the previous decade are summarized in **Figure 3**. Pennington County has seen the fifth fastest population growth among South Dakota counties¹ within the last decade. The total population of Pennington County grew from 101,250 in 2010 to 112,000 in 2021, an increase of 10,750 (10.9%) residents.

Figure 3 - South Dakota’s Top 20 Counties by Population Growth (2010 – 2021)



The natural beauty of the Black Hills, the many outdoor activities, and a business-friendly economic environment are just some of the County factors that attract new residents and investors. That said, population growth is occurring primarily within the County’s municipalities, especially within Rapid City

¹ [Data Commons](#)

and Box Elder. The County is experiencing rural population growth, primarily within a few miles of the city limits. The eastern part of the county remains sparsely populated and is not experiencing significant growth.

The municipalities' capacity to accommodate growth is dependent upon a variety of conditions including but not limited to the feasibility of building new municipal infrastructure, physical conditions such as terrain, soil conditions, proximity of federal lands, incentives and policy decisions, public financing, and leadership priorities. Even though the conditions may hinder municipal expansion, there remains a strong demand for development along the periphery of city boundaries, which often results in Pennington County assuming responsibility.

FUTURE GROWTH AREAS

Urban Growth

As a result of various drivers of population growth to the County, subdivision expansion is contributing to the transportation and infrastructure demands of Pennington County and the Rapid City metro area. County Transportation and Planning staff noted that a concentration of new development has been and will continue to be occurring southeast and southwest of Rapid City and Box Elder, as well as many other urban growth areas.

Rural Growth

In addition to the more centralized Rapid City and Box Elder subdivision growth areas, rural locations within Pennington County are also experiencing housing and subdivision growth.

Ellsworth Air Force Base (EAFB)

A key growth area surrounds Ellsworth Air Force Base, which is located 4 miles east of Rapid City and adjacent to Box Elder. In March of 2019, the United States Air Force announced that Ellsworth Air Force Base would be the nation's first home to the new B-21 Raider training and operational squadrons. The announcement indicated Ellsworth Air Force Base was selected as the "Main Operating Base 1" for the B-21, which will include B-21 operational squadrons, a B-21 formal training unit, and a weapons generation facility. Some B-21 Bomber facilities are expected to be operational in 2024.

This addition at Ellsworth Air Force Base is expected to bring hundreds of new personnel and their families to the region. This growth will result in new infrastructure needs, including weapon storage facilities, hangars, schools, housing, and transportation. According to the Ellsworth Economic Impact Statement, Ellsworth currently has an annual economic impact of \$359,475,786 and employs 10,622 personnel. This impact will increase as the base continues to emerge as an economic anchor within the region. As a result, an estimated 3,000 to 5,000 new residents are anticipated in the short-term 5-year planning period.

Key growth areas falling within County transportation jurisdiction are summarized in **Table 2**.

Table 2 - County Growth Areas: Urban and Rural

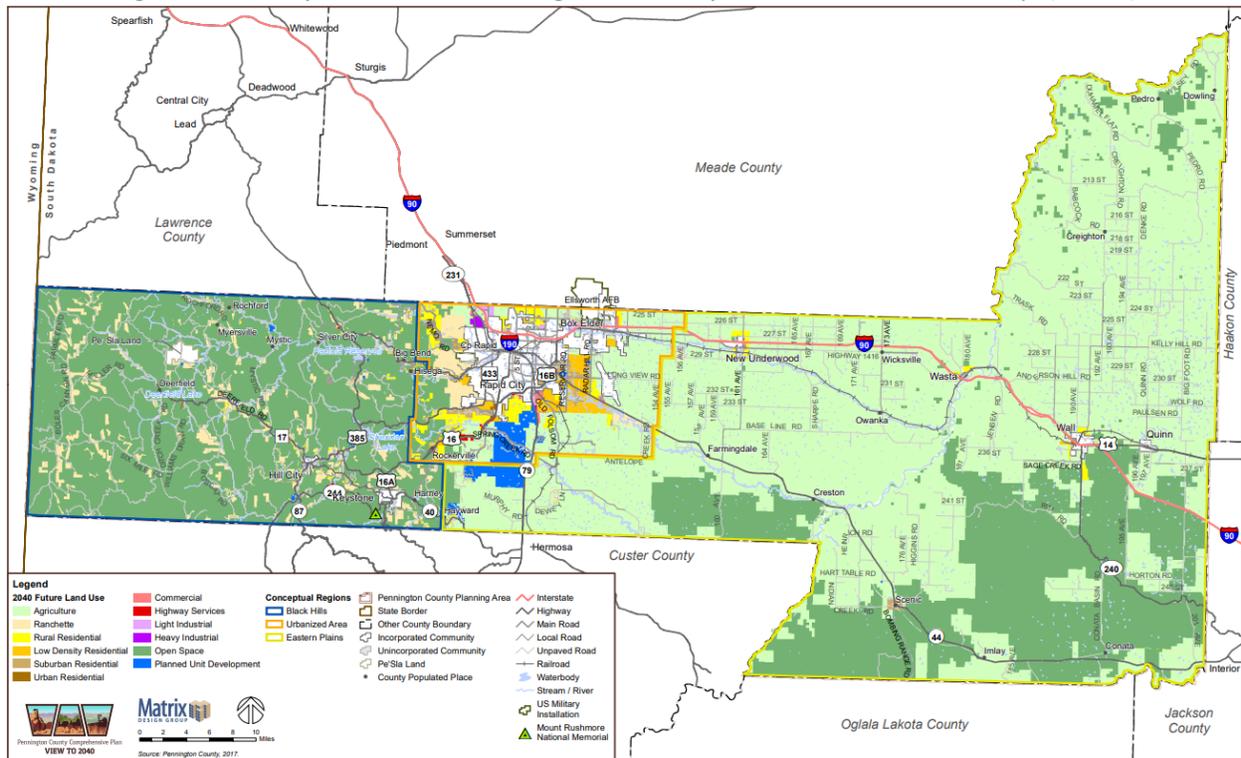
County Growth Areas	Notes
Urban Growth Areas	
Hwy 1416	Subdivision growth
Radar Hill	Subdivision growth; Potential for commercial; particularly the west side
Neck Yoke	Subdivision growth
Rapid Valley	Northwest of Rapid City Airport
Apple Valley	The majority of Apple Valley area is covered by Rapid Valley.
Red Rock area	Southwest of Rapid City
Box Elder area	Subdivision growth
Twilight Drive corridor	Section 1, 2, 11, and 12 - eastern undeveloped area around the airport/Box Elder and HWY 44 – likely to be developed within the next 10 years
Reservoir Rd in NW ¼ Section	108 new homes are projected
Quail Ridge	This area is covered within other larger growth areas and Quail ridge is within Rapid City limits.
Rapid City Regional Airport (RAP)	New Airport Master Plan. Included in Radar Hill area. Potential for commercial development and connection to Radar Hill Road
Rural Growth Areas	
Black Gap	Along SD 79 South of Rapid City
Colonial Pine Hills	Southwest of Rapid City
Hill City / Old Hill City Road	Adding Potential ETJ area from city comp plan
Old Hill City Rd	Keystone to Hill City
Murphy and Shorb Rd	114 Lot Development
North of Hermosa (Pennington County)	South Hills area; potential for utility expansion; flagpole annexation being litigated
Caputa (H & H Development)	Water system (have own water rights); Potential for 3+acre Ranchettes
New Underwood Murphy Ranch	3-mile platting jurisdiction Subdivision Growth

Future Land Use

The Pennington County Planning Department is concurrently in the process of updating its Future Land Use (FLU) plan - dated May 5th, 2020 – as well as its Comprehensive Plan. The updated FLU plan is anticipated to be completed in early 2024.

For the purposes of this MTP, the existing FLU plan (shown in **Figure 4**) was used to help accurately verify key urban and rural growth areas within Pennington County.

Figure 4 – May 5, 2020, Pennington County Future Land Use Map (2040)



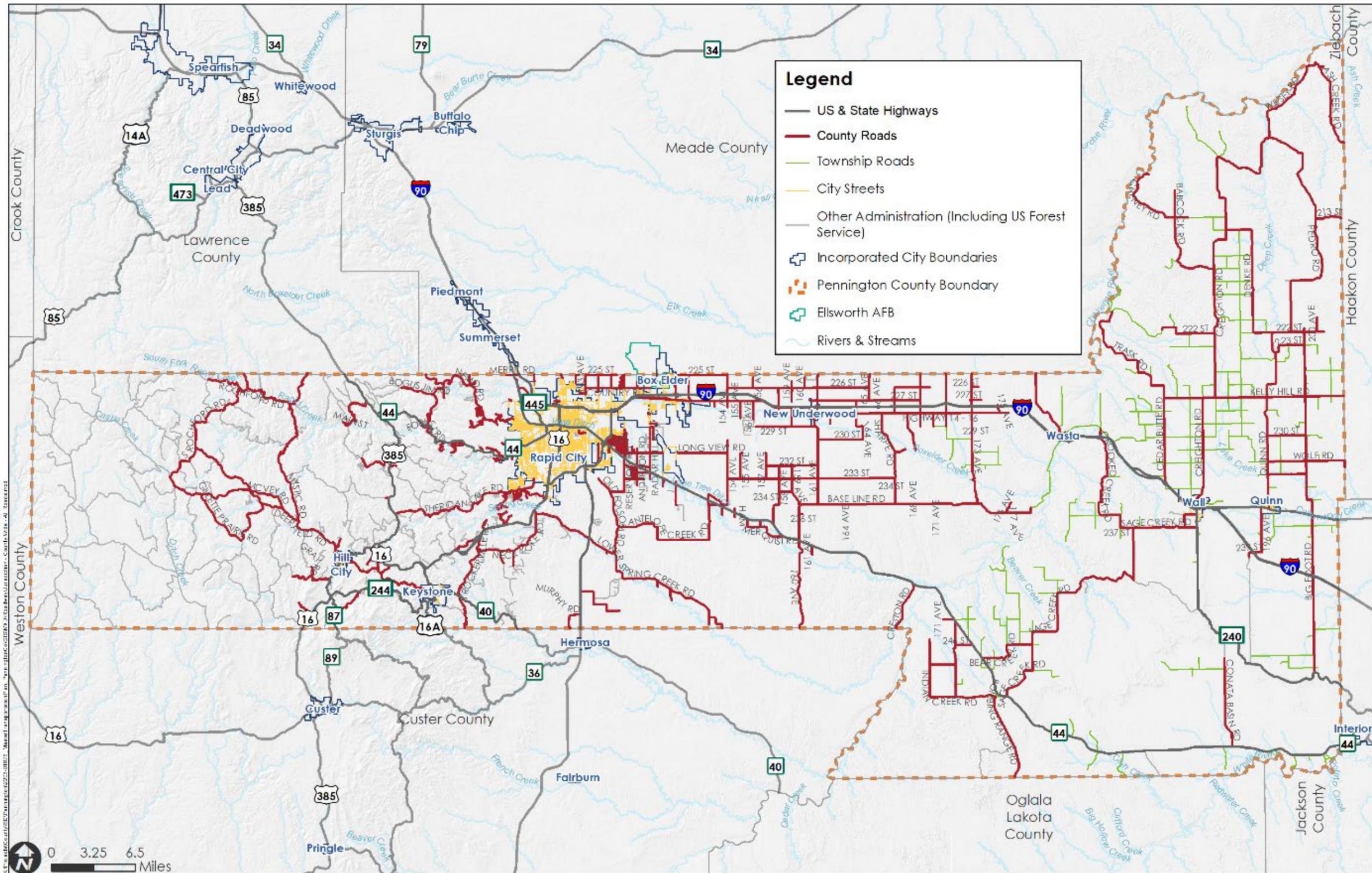
ROADWAY

While a roadway conditions analysis was beyond the scope of this study, roadway conditions were considered a critical element in prioritizing project needs for the future. Project priorities to address deficient roadway conditions were established based on visual inspections, input from County staff and public stakeholders, and a Pavement Conditions Report prepared for Pennington County that was under review at the time of this project.

Jurisdictional Ownership

Within the Pennington County study area, there are a variety of highway and road systems under different jurisdictions. The South Dakota Department of Transportation (SDDOT) is responsible for maintaining the *Interstate and State Highway systems*, which move people and freight efficiently across the region, state, and country. *County and Township roadways* distribute traffic to home, work, and businesses (collectors), and provide rural roads to private land, farms, and rural residencies. Within the County’s cities, a system of streets composes the traditional grid systems typically found across the Midwest. Depending on jurisdiction, these roadways draw from different funding sources for maintenance and improvements. On the next page, the Pennington County roadway system is shown by jurisdiction in **Figure 5**.

Figure 5 - Pennington County Roadway System by Jurisdiction



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

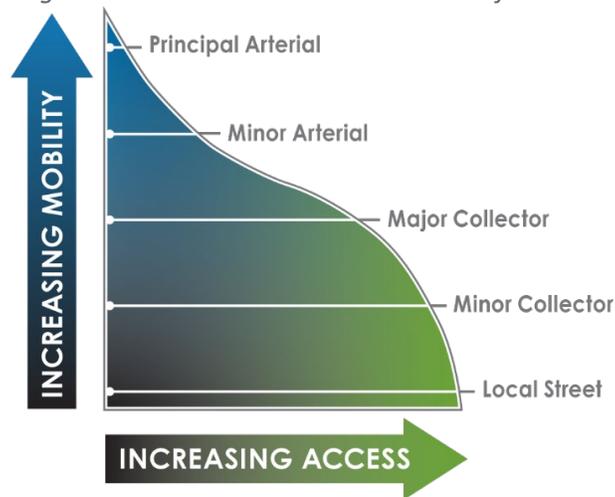
July 2023

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Functional Classification

The operation of a county's transportation network is supported by the functional classification of its roadway system. This classification defines the role that each road segment is intended to play in serving the flow of traffic through the study area. By defining a functional classification system, the operation of traffic can be conducted in a logical and efficient manner. The FHWA organizes roadways into a hierarchy of five general functional classifications as shown in **Figure 6**.

Figure 6 - FHWA Functional Classification



Most streets and highways have one of two predominant functions: either they provide the motorist with access to abutting land, or they promote optimum mobility through an area. Traffic that provides access to abutting land is considered “local,” while all other traffic is considered “through.” Through traffic neither originates nor terminates within a designated area, but simply traverses it. Conversely, local traffic has origins or destinations within a designated area.

A general definition for each of the FHWA functional classifications is provided below. For the purposes of this MTP, rural functional classifications are roads outside the urban growth boundary, whereas urban functional classifications are within urbanized areas inside the urban growth boundary.

Principal Arterials

Principal Arterials provide for regional and interstate transportation of people and goods. This is done by designing facilities to accommodate high speeds and long, uninterrupted trips. In urban areas, principal arterials constitute high-volume corridors with a large portion of regional trips.

The FHWA specifies three subcategories within the Principal Arterial classification:

- Interstates are the highest classification of Arterials, designed for high-speed, long-distance travel. I-90 is the county's only interstate, running east-west through the county and across South Dakota.
- Other Freeways & Expressways, while not included in the Interstate system, operate similarly to Interstate roadways. Roads in this classification generally have directional travel lanes that are separated by a physical barrier, with access points limited to on- and off-ramp locations or a limited number of at-grade intersections.

- Other Principal Arterials serve major metropolitan areas and can also provide mobility through rural areas. Unlike their access-controlled counterparts, Other Principal Arterials occasionally directly serve abutting land uses.

Minor Arterials

Federal legislation continues to use functional classification in determining eligibility for funding under the Federal-aid program. At present, roads functionally classified as a “rural major” or “urban minor” collector or higher are eligible for Federal assistance – these are referred to as “Federal-aid Highways”.

Minor Arterial routes within the street system provide connections and support the Principal Arterial system. Trips using these facilities are generally shorter and spread out over a smaller geographic area. Minor Arterials allow more access than their Principal Arterial counterparts. Minor arterials can be further classified into rural and urban minor arterials.

- Rural Minor Arterials form a rural network having the following characteristics:
 - Link cities, towns, and other traffic generators like major resort areas that attract travel over long distances and form an integrated network to interstates and freeways.
 - Spaced at intervals to allow a reasonable distance for all developed areas within an arterial highway.
 - Provide for relatively high overall travel speeds, with minimal interference to through movements.
- Urban Minor Arterials interconnect with the principal arterials to provide trips of moderate length with less travel mobility than principal arterials. The spacings of urban minor arterials are generally not more than one mile in fully developed areas.

Collectors

Collectors serve a critical role in the roadway network by gathering traffic from Local Roads and funneling them to the Arterial network. Within the context of functional classification, Collector roads in Pennington County are broken down into three categories: Rural Major Collectors, Urban Major Collectors, Rural Minor Collectors, and Urban Minor Collectors.

- Rural Major Collectors provide service to any county seat not on an Arterial route, to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intra-county importance such as consolidated schools, shipping points, county parks and important mining and agricultural areas.
- Urban Major Collectors serve both land access and traffic circulations in high density residential, and commercial/industrial areas. They distribute and channelize trips between Local Roads and Arterials, usually over greater than three-quarters of a mile.
- Rural Minor Collectors are spaced at intervals, consistent with population density. Minor Collectors collect traffic from local roads and bring all developed areas within a reasonable distance of a major collector or arterial road. Minor Collector facilities provide service to the remaining smaller communities and link local traffic generators with their rural hinterland. Pennington County currently has 19.6-miles of roadways that are classified as rural minor collector.

- Urban Minor Collectors serve both land access and traffic circulation in lower density residential and commercial/industrial areas. Typical operating characteristics of Minor Collectors include lower speeds and fewer signalized intersections. Minor Collectors penetrate residential neighborhoods, but only for a short distance.

Table 3 - Summary of Pennington County Roadway Systems by Functional Class

Local Roads and Streets

Local roads and streets provide direct access to residential, commercial, and industrial properties. These streets have slower speeds and can include traffic calming measures. They are not intended for long distance travel. Local streets are the largest element in the public road network in terms of mileage. Local streets can be further classified into rural and urban local streets.

- Rural Local Roads provide access to adjacent land and service to travel over relatively short distances as compared to collectors or other highway systems.
- Urban Local Streets comprise all roadway facilities that are not on any of the higher systems. They provide direct access to abutting land and access to the higher order systems. It offers the lowest level of mobility.

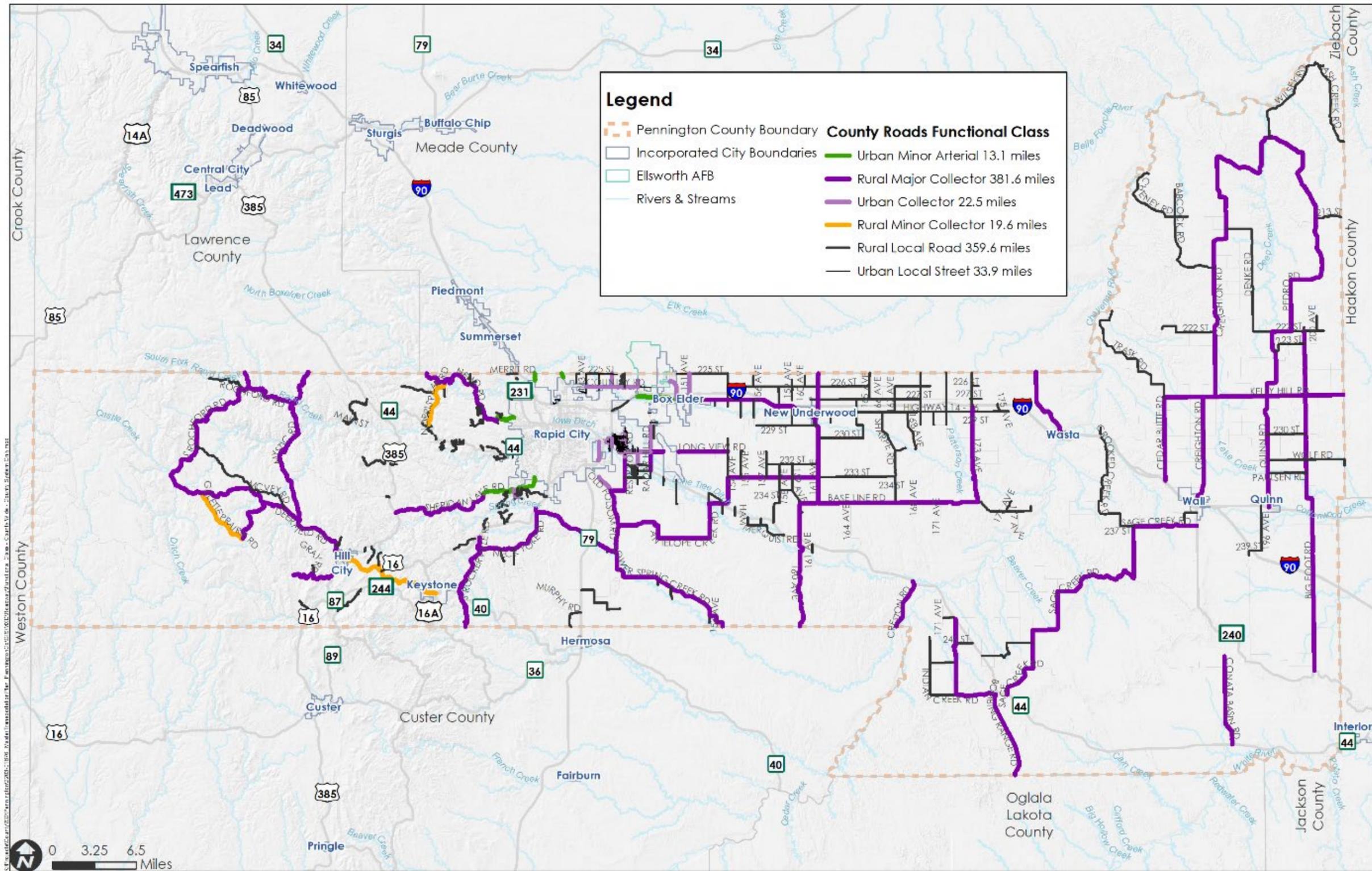
Functional Class	Jurisdiction			
	All Agencies		Pennington County	
	Miles	Percent	Miles	Percent
Interstate				
Urban	29.7	1.2%	0	0.0%
Rural	70.6	2.8%	0	0.0%
Expressway				
Urban	14.1	0.6%	0	0.0%
Rural	24	0.9%	0	0.0%
Principal Arterial				
Urban	20.1	0.8%	0	0.0%
Rural	43.9	1.7%	0	0.0%
Minor Arterial				
Urban	74.3	2.9%	13.1	1.6%
Rural	121.8	4.8%	0	0.0%
Major Collector				
Urban	71.3	2.8%	0	0.0%
Rural	395.6	15.5%	381.6	46.2%
Minor Collector				
Urban	0	0.0%	22.5	2.7%
Rural	120.2	4.7%	19.6	2.3%
Local Roads				
Urban	448.9	17.5%	33.9	4.1%
Rural	1,125.1	44.0%	359.6	43.1%
TOTAL	2,559.6	100%	874.2	100%

Functional Classification within Pennington County

There are approximately 2,560 miles of roadway within Pennington County, 874.2 miles of which are maintained by the County. The number of roadway miles defined under each FHWA functional classification is shown above in **Table 3**. A map of the FHWA functionally classified system is presented in **Figure 7** on the next page.

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Figure 7 - Pennington County Roadway System by Functional Class



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

July 2023

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Roadway Number of Lanes Inventory

The roadway functional classification does not define the number of lanes required for each roadway. For instance, a collector street may have two, three, or four lanes, whereas an arterial street may have up to nine lanes. The number of lanes is a function of the expected traffic volume on the roadway and serves as the greatest measure of roadway capacity. Mileages for roads by number of lanes were determined based on GIS data obtained from SDDOT, with median-divided roadways collapsed to a single centerline where feasible.

The number of lanes for roadways under the jurisdiction of Pennington County is shown in **Figure 8**, with total mileage for each “number of lanes” category listed in the Figure’s map legend. Nearly all Pennington County roads are two-lane roads, albeit with some recent expansions. In 2022, level of service (LOS) was improved from two lanes to three lanes on a segment of Sheridan Lake Road from Spring Canyon Trail to Dunsmore.

Roadway Surface Types

South Dakota's transportation network includes over 83,000 miles of roads, of which about 10 percent are state-controlled, and 3 percent are federal routes. This leaves about 72,000 miles of roadway to be maintained by counties, townships, road districts, and municipalities, and most of these are considered low-volume roads, defined by AASHTO as local or minor collector roads carrying a daily traffic volume of 2,000 vehicles or less². These roads are primarily either bituminous- or gravel-surfaced, with the more rural and lower volume roads typically being gravel-surfaced and the more heavily traveled roads being bituminous-surfaced.

In Pennington County, the most common type of county-owned roadway surface is gravel, which accounts for 57.7% (504.7 miles) of the roadway system. A breakdown of County road surface type percentages is provided in **Table 4**. Paved surfaces make up 40.8% (356.6 miles), Graded and drained roadways 1.3% (11.3-miles), and concrete roads 0.2% (1.6 miles) of the roadway system. Liberty Boulevard, from its junction with Highway 1416 north to the intersection with Tower Rd in Box Elder, is the only concrete road on the county system. **Figure 9** displays the County roadway system by surface type.

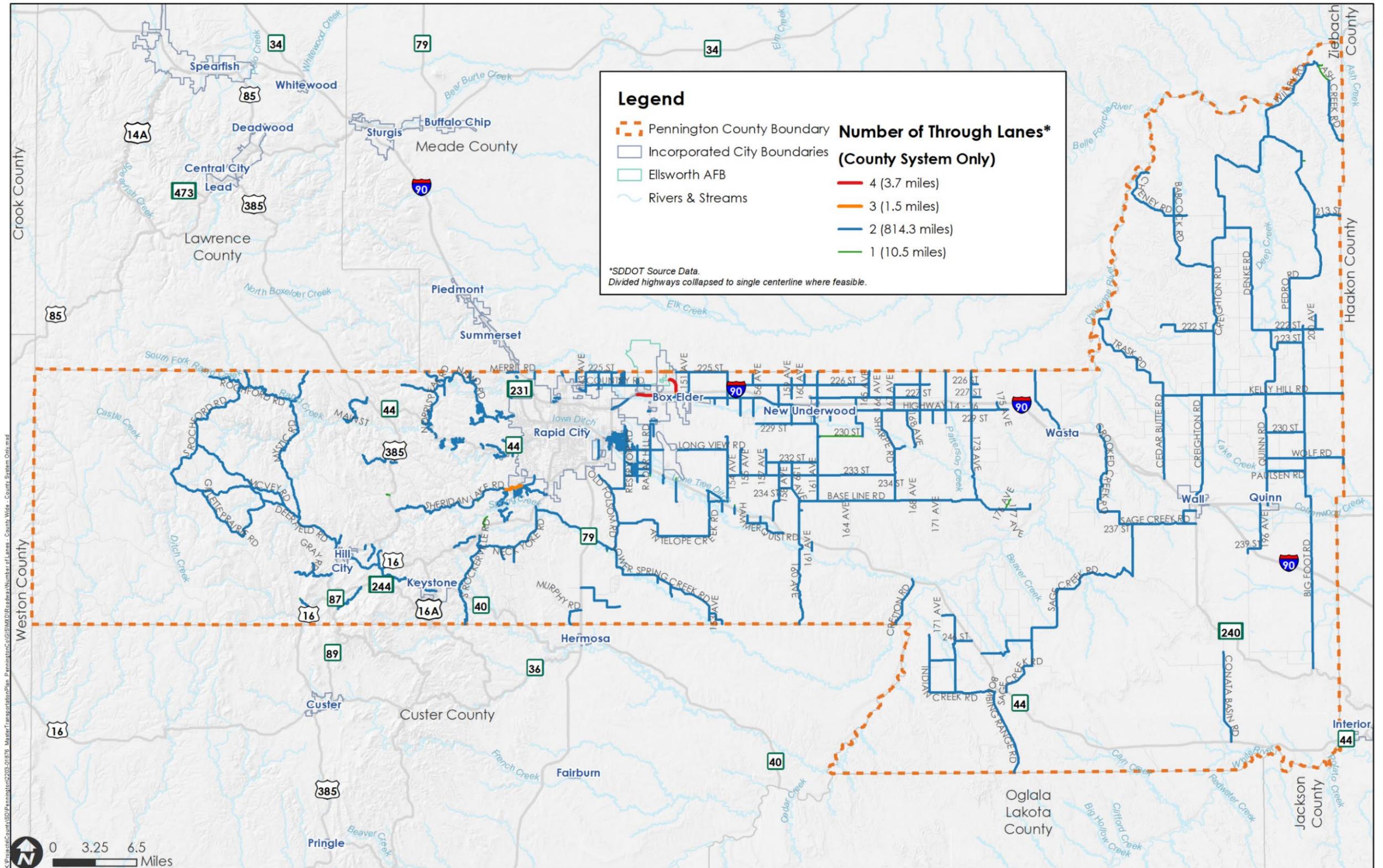
Table 4 - County Roadway System by Surface Type

Surface Type	Miles	Percent
Paved	356.6	40.8%
Concrete	1.6	0.2%
Gravel	504.7	57.7%
Graded & Drained	11.3	1.3%
TOTAL	874.2	100.0%

² AASHTO Guidelines for Geometric Design of Low-Volume Roads (2019).

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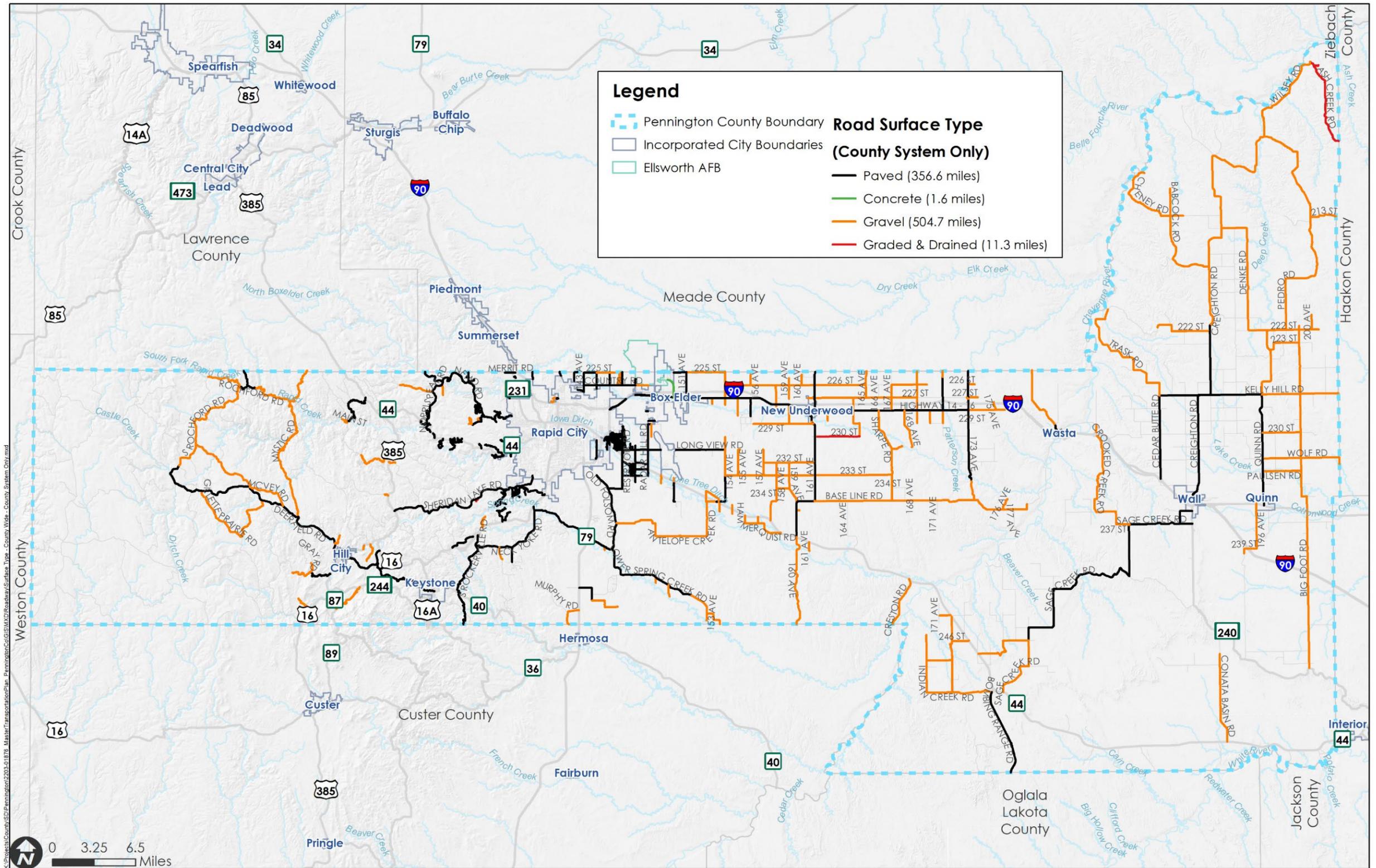
Figure 8 - Roadway System by Number of Lanes



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

September 2023

Figure 9 - Roadway System by Surface Type



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

February 2024

Roadway Surface and Pavement Management

South Dakota's transportation network includes over 83,000 miles of roads, of which about 10 percent are state-controlled, and 3 percent are federal routes. This leaves about 72,000 miles of roadway to be maintained by counties, townships, and municipalities, and most of these are considered low-volume roads (LVR), defined by AASHTO as local or minor collector roads carrying a daily traffic volume of 2,000 vehicles or less. These roads are primarily either bituminous- or gravel-surfaced, with the more rural and lower volume roads typically being gravel-surfaced and the more heavily traveled roads being bituminous surfaced.

County Road Pavement Conditions Report

Pavement Condition Index, or PCI, is a rating from 0 to 100 of the severity and extent of distresses observed on a pavement surface. Examples of typical pavement surface distresses are spalling, rutting, scaling, and cracking. In general, a PCI rating of 0-50 indicates that future reconstruction or reclamation may be necessary. A rating of 51-70 typically requires rehabilitation in the form of patching or a mill and overlay project, and a rating of 71-100 usually means that only pavement preservation treatments such as crack sealing or seal coating are needed.

Pennington County hired a contractor to generate a Pavement Condition Index (PCI) report (2022). Results of the 2022 PCI data are shown below. Some roads were excluded from analysis due to construction or other issues. Instances of known changes to PCI ratings were manually corrected to reflect comments from county staff and the study advisory team. Changes included portions of Sheridan Lake Rd which had been reconstructed and short portions of 160 and 173 avenues which were converted to gravel. Updated portions of Sheridan Lake Rd were given a PCI score of 100, although this may not reflect actual current conditions. After removing roads converted to gravel and segments which were not analyzed, 334 miles of analyzed county roads remain. Findings of the PCI analysis can be seen in **Figure 10** and in the map in **Figure 11**.

Figure 10 - Pennington County Roads Pavement Conditions Index 2022



Roadway Surface Decisions

Paved roads provide several improvements over gravel roads, including more dependable winter surfaces, increased safety from enhanced delineation, higher skid resistance, a smoother surface that increases user satisfaction and reduces vehicle maintenance costs, redistribution of traffic away from gravel roads, and an increased tax base on adjacent property.

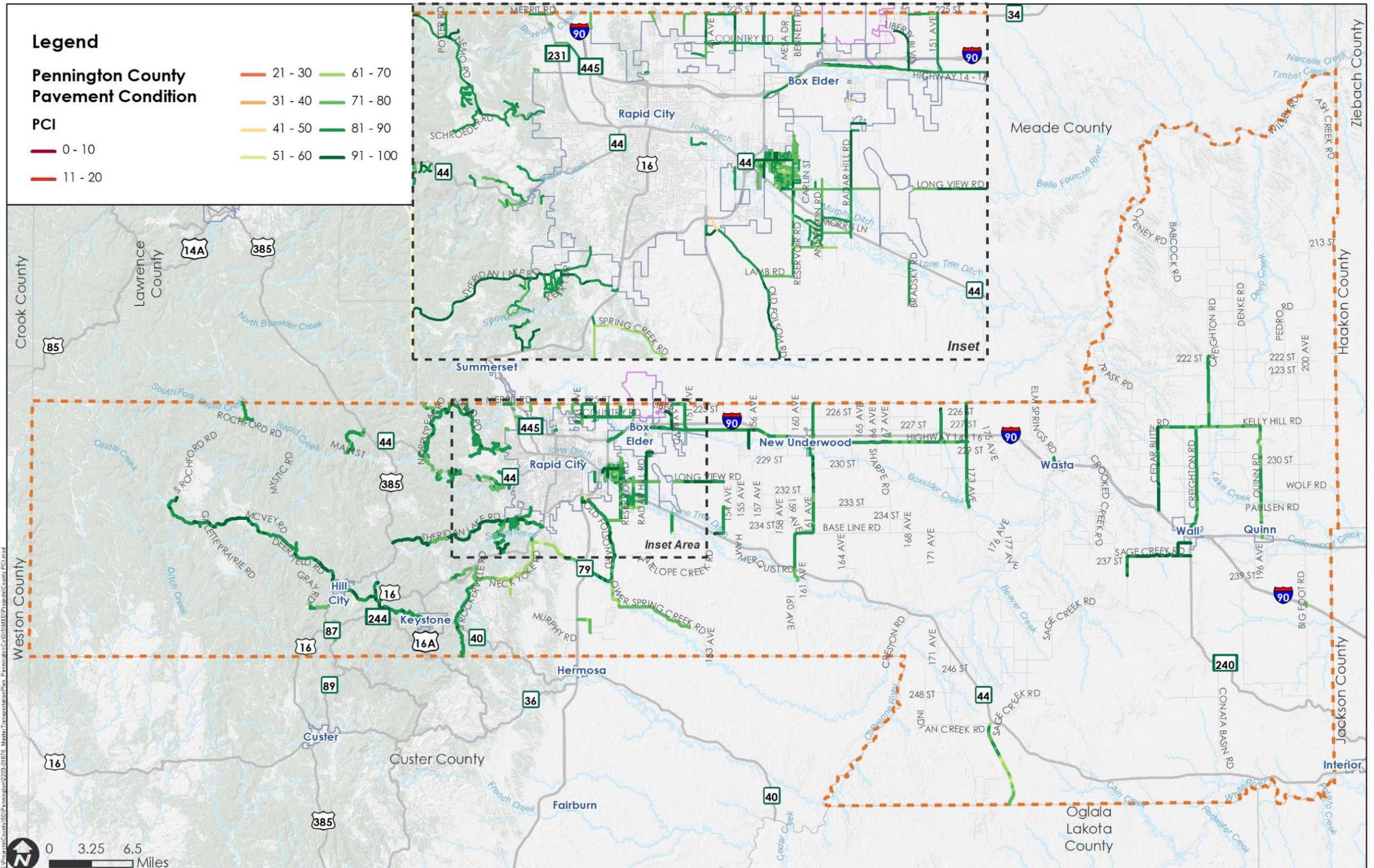
Existing County Road Graveling Plan

Ruts, potholes, and displaced gravel are an eventual concern on even lightly traveled gravel roads.

While all gravel roadways require periodic re-grading, a regular maintenance program that supports the strength and integrity of the road can reduce the frequency of grading.

Pennington County currently uses a Microsoft Excel-based spread sheet in combination with their asset management software to prioritize roadway segments for maintenance, establish maintenance schedules, and forecast maintenance costs. Cost forecasts are based on various inputs including travel, labor, and material cost estimates. The county has a policy of re-graveling their road segments in 8-year cycles.

Figure 11 - County Roads Pavement Condition Index (2022)



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

November 2023

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Bridges and Culverts

Culverts and bridges are important supporting components of a transportation system. Culverts allow a roadway to cross minor waterways and irrigation ditches, whereas bridges allow a roadway to cross more significant features such as other roads, railroads, and major waterways.

A bridge’s sufficiency rating measures a bridge’s overall condition based on regular required inspections. The ratings are used to determine when a bridge is eligible for rehabilitation or replacement. A bridge with sufficiency rating greater than 80 is generally considered in good condition. A new bridge will have a sufficiency rating of 100, whereas a sufficiency rating of less than 50 is candidate for replacement. The Federal Highway Administration (FHWA) inspects and assigns bridge sufficiency ratings to all structures that fall within the definition of “bridge,”³ including County bridges and most County box culverts. The inspection of bridges and determination of sufficiency is conducted in accordance with the FHWA national bridge inspection standards⁴.

Of the 126 federally inspected bridges (109) and culverts (17) maintained by the County, 75 (60%) have a sufficiency rating of 80 or greater, 36 (29%) have a sufficiency rating between 50 and 80, and 15 (12%) have a sufficiency rating below 50. As shown in **Figure 12**, bridge sufficiency rating is generally correlated with the age of a bridge or culvert. Current 2024 Bridge and Culvert sufficiency ratings for the study area are shown in **Figure 13**.

Figure 12 - Age of the Bridge/Culvert and corresponding 2023 Sufficiency Ratings

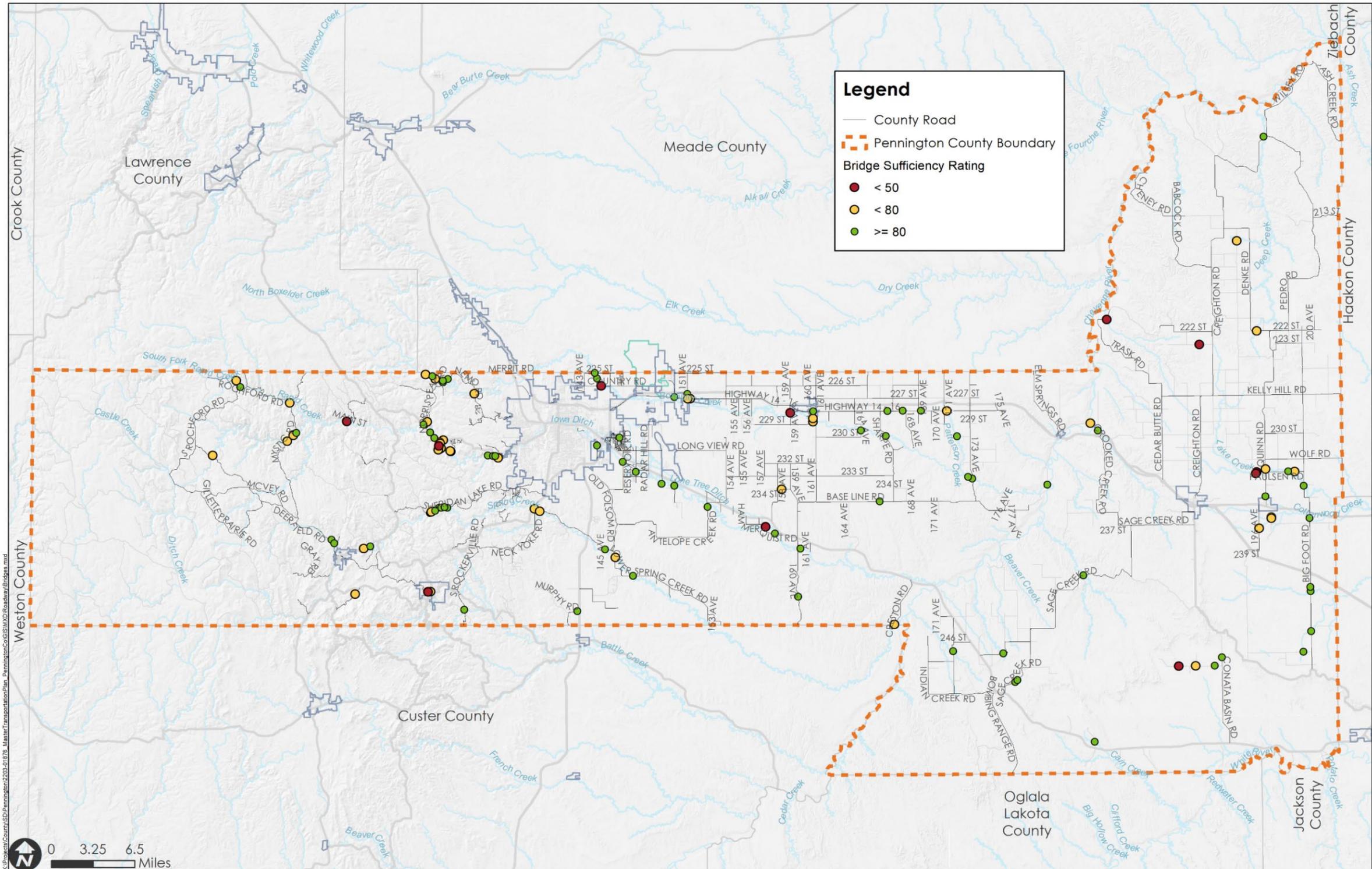


³ <https://www.law.cornell.edu/cfr/text/23/650.403>

⁴ <https://www.fhwa.dot.gov/bridge/nbis.cfm>

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Figure 13 – NBI (2023) Bridge and Culvert Condition Data



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

December 2023

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MULTI-MODAL TRANSPORTATION

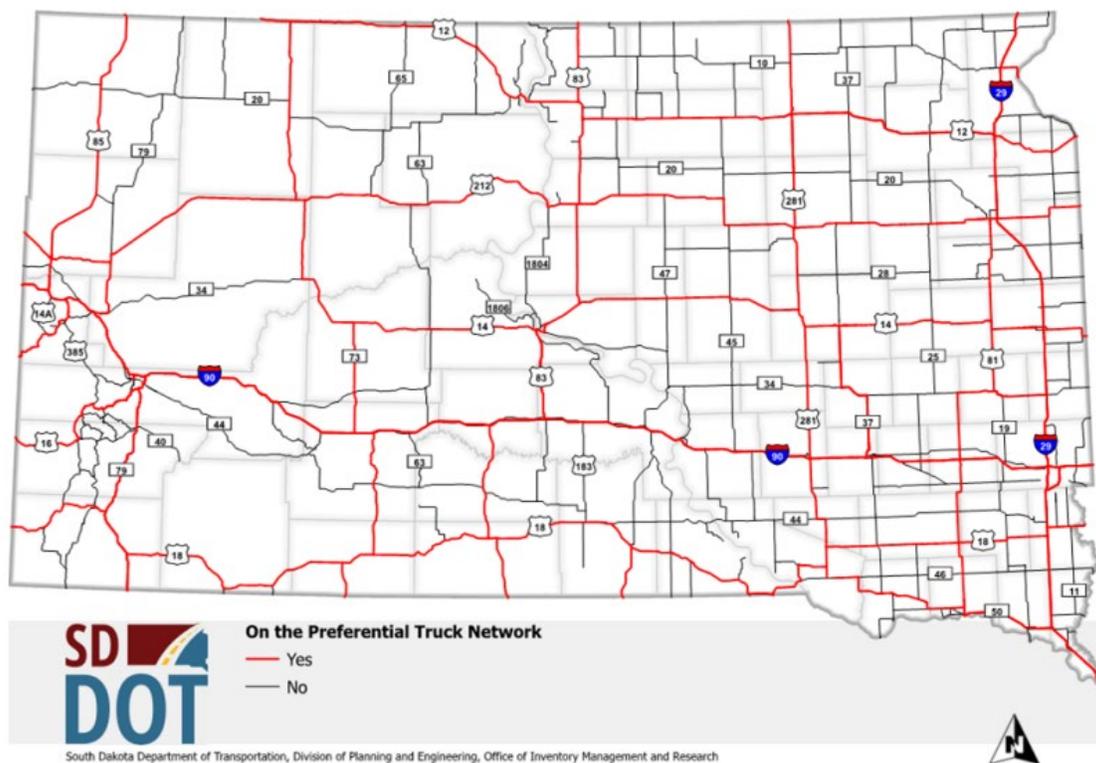
Freight

Movement of freight has taken on increasing focus in recent federal transportation legislation. New funding opportunities and programs focused on the movement of goods have been created at the federal level, along with requirements that public agencies place greater emphasis on freight. County highways play an important role for circulating freight traffic to and from important destinations within the County. Important freight components are highlighted in the following subsections.

Trucks

The state's preferential truck network is shown in **Figure 14**. Interstate 90, US Hwy 16, and State Hwy 79 are the designated freight corridors in Pennington County. Impacts of e-commerce will be continually monitored as Amazon and other e-commerce distribution operations become active.

Figure 14 - South Dakota's Preferential Truck Network



Railroad

The Rapid City Pierre and Eastern Railroad (RCPE) is a regional railroad that operates across South Dakota. Operating 743 miles of standard-gauge tracks (679 Miles within SD), the RCPE spans the State east to west from western Minnesota to northeastern Wyoming and northwestern Nebraska. The railroad hauls 60% agricultural products and 25% minerals, mainly bentonite. The 423-mile main line between Tracy, MN and Rapid City provides freight traffic for grain operations, fertilizer distribution facilities, ethanol plants, soybean processors, aggregate customers, lumber yards, and scrap facilities.

In addition to freight rail, Pennington County has a short (approximately ten miles) heritage railway. Named the 1880 Train, it carries passengers between Hill City, SD and Keystone, SD with service mostly during the summer months. The railroad was added to the National Register of Historic Places on February 5, 2003.

The freight and rail network in Pennington County is shown in **Figure 15**.

Transload

The *Midcontinent Transload and Freight Solutions* facility is located east of Box Elder at 15190 Highway 1416 along the south side of the Highway. This multi-modal transload freight terminal facilitates offloading of railcar freight to trucks for regional distribution. The facility serves the Rapid City, Pierre & Eastern Railroad (RCPE). It has three Class 1 Rail Interchanges: Union Pacific (UP); Canadian Pacific (CP); and Burlington Northern Santa Fe (BNSF). The facility has 120,000 sq. ft. of warehouse capacity with 120 railcar spots. The Transload facility currently generates approximately 40 truck trips per day.

Logging Industry Activity

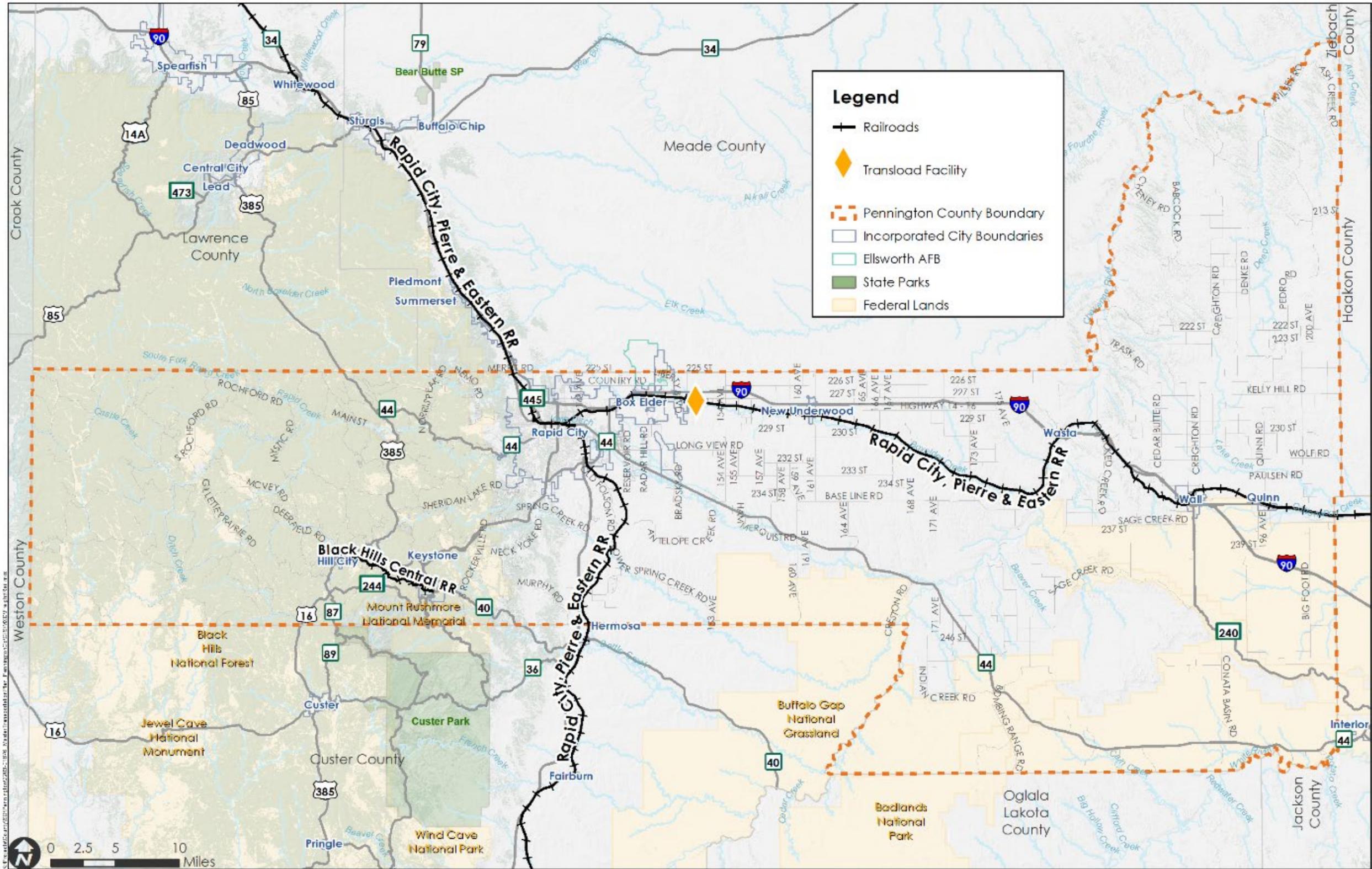
The Black Hills are integral to the regional logging industry. Temporary timber sales in Black Hills Forest locations result in impacts to the County roadway network due to truck access and circulation patterns being adjusted on short notice to accommodate the temporary sales locations. Because major timber operations and logging companies have an ongoing presence in the Black Hills, it is important to maintain frequent communications with the Pennington County Highway Department to ensure ongoing maintenance of County highways and construction projects. County highways used for logging purposes include, but are not limited to, Deerfield Road east of Hill City, South Rochford Road, and Mystic Road.

ATV/UTV Facilities

Demand for all-terrain vehicle (ATV) and utility-terrain vehicle (UTV) facilities has grown in Pennington County. Due to the nature of ATV and UTV use, there are few other recreational uses that ATVs and UTVs are compatible with besides other motorized uses. ATV's and UTV's are generally used for farming and heavy-duty tasks, snow removals, hunting, golf courses, recreation, racing, etc. In addition to US Forest Service trails, UTVs are allowed on many roads including County Highway connectors, logging roads and trails in Pennington County. While the county does not specifically designate ATV/UTV roadway facilities within the Pennington County roadway system, these vehicles are increasingly being driven on paved and unpaved roads designated for all vehicle types (**Figure 16, Figure 17**).

Figure 18 highlights county jurisdiction roads within the Black Hills Area that are also shown on USFS's Motor Vehicle Use Map (MVUM). According to US Forest Service data the highlighted county roads are designated as permitting ATV/UTV access. Because of permitted use by ATV/UTV's, the county can continue to expect high ATV/UTV traffic on these roads and presents potential road maintenance issues especially for county-maintained gravel roads. Recommendations for ATV/UTV policy can be found in **Chapter 5**.

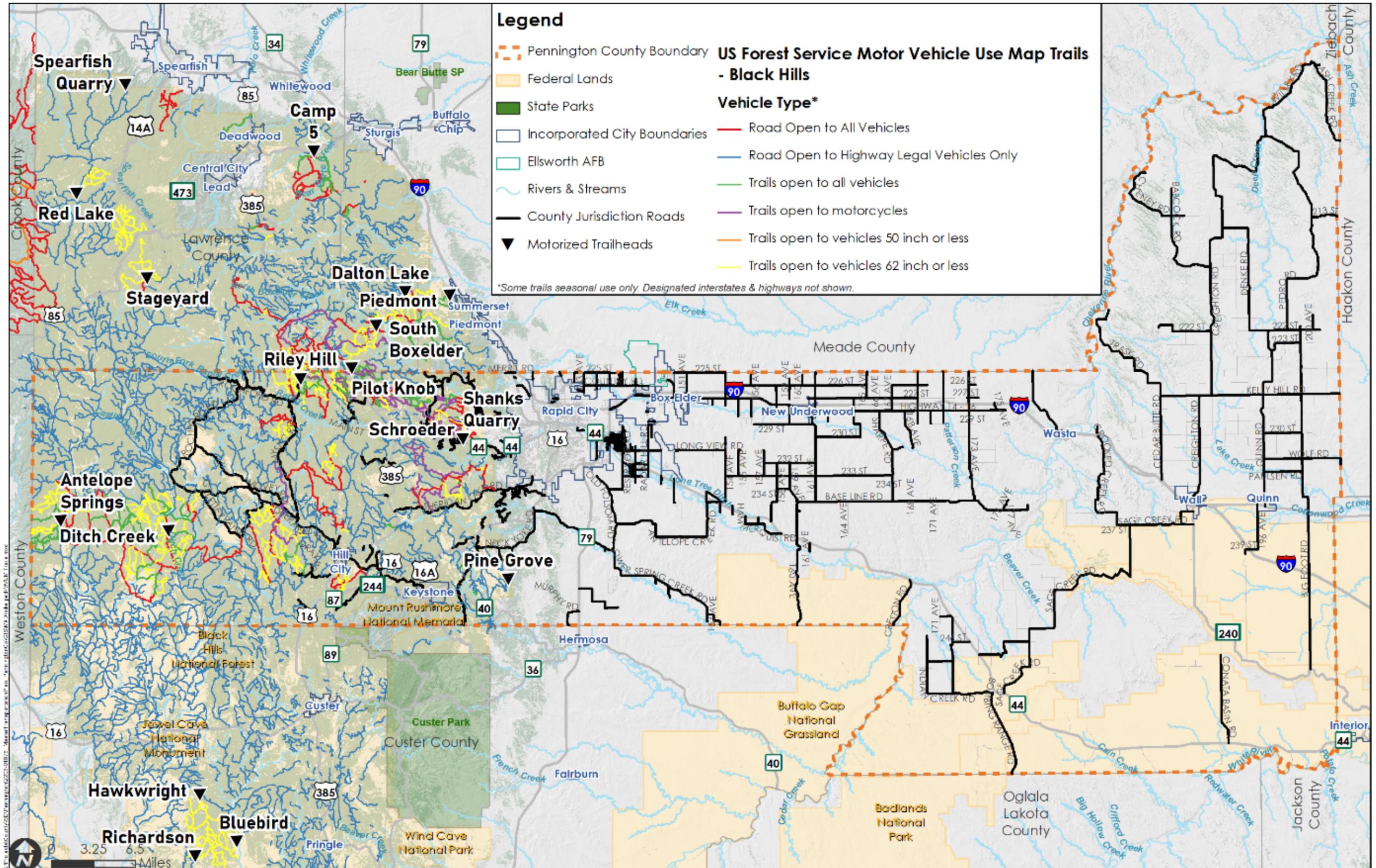
Figure 15 – Freight and Rail Network



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

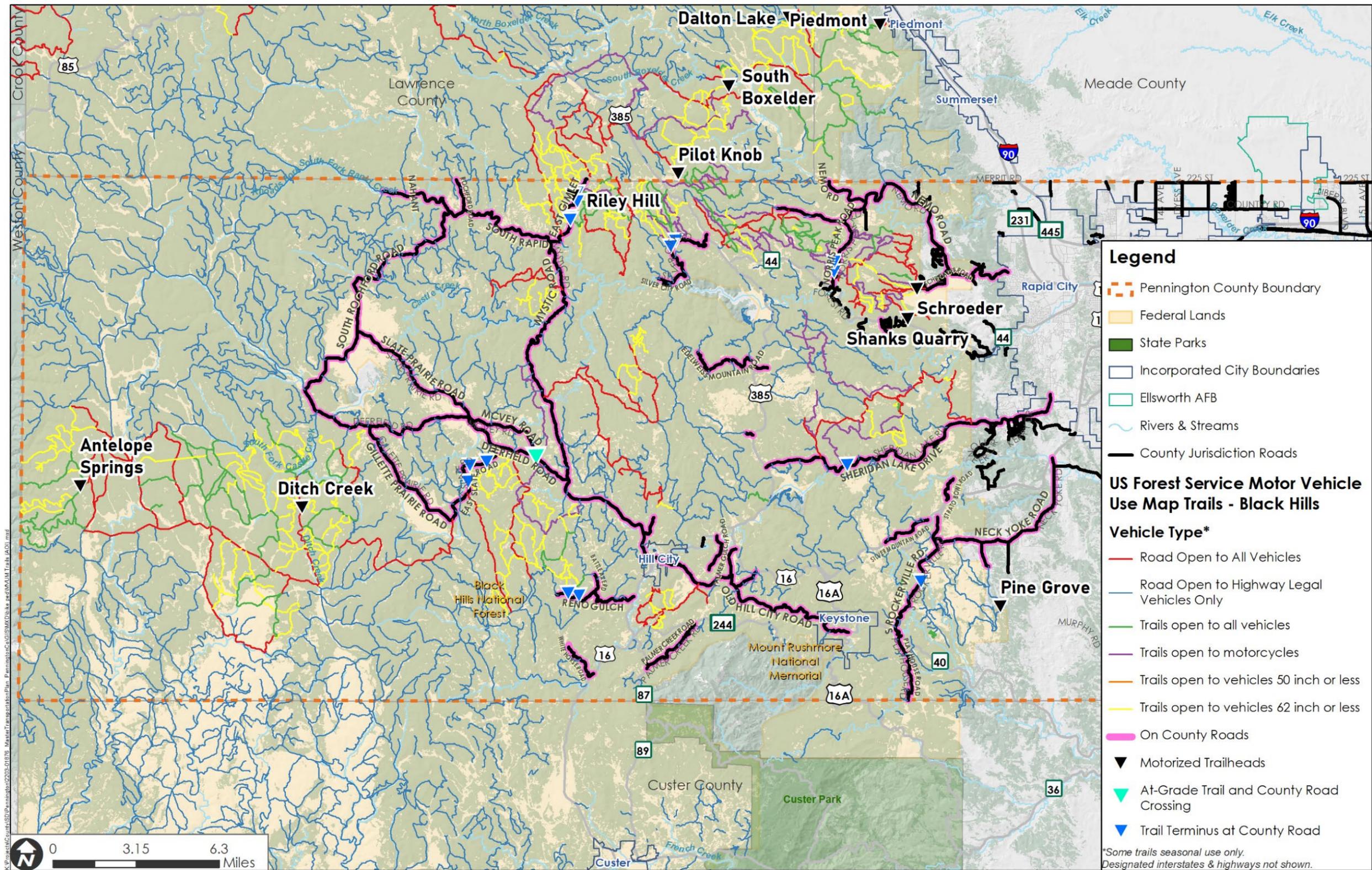
July 2023

Figure 16 - US Forest Service County Wide Roads & Trails: Motorized Vehicle Use Map



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

Figure 17 - (Pennington County – Black Hills Area) Motorized Vehicle Use Map



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

October 2023

Figure 18 - (Pennington County – Black Hills Area) Pennington County Jurisdiction Roads w/ designated Forest Service Motorized Trails



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

Non-Motorized Facilities

The inventory of non-motorized travel conditions was compiled based on a desktop review of current infrastructure. In addition, the public involvement process afforded the project team an opportunity to ask Pennington County residents and businesses about the existing non-motorized network and receive feedback about current conditions. Comments were gathered at the six public open houses, individual meetings with stakeholders, and an online survey. The survey, which covered a variety of transportation categories and issues, included questions related to pedestrian and bicycle travel in Pennington County.

Pedestrian Facilities

Pennington County highways are primarily rural sections, meaning that no curb, gutter, or sidewalk is typically provided along County highways. Individuals seeking to travel on foot throughout the County typically walk along the edge of the roadway or available shoulder width.

Bicycle Facilities

Bicycle use in Pennington County is on the increase. Bicyclists use the roadways and paths for social, recreational and commuting purposes. Mountain bike trails are becoming a featured attraction in the western portion of Pennington County. Road cycling aficionados can be seen traveling County highways.

The Rapid City Metropolitan Planning Organization (MPO) and the City of Rapid City recently completed the Rapid City Area Bicycle and Pedestrian Master Plan, which included recommendations for bike facilities throughout the Rapid City area. Bicycle conditions were evaluated by the project team based on technical review and input received from survey respondents, the general public, and stakeholders.

Figure 19 shows Rapid City Area bike lanes, trails, and shared use paths.

The Box Elder Parks and Open Space Master Plan also documents planned and proposed new sidewalks, trails, and nature trails, as well as recommendations for changes to street crossings (See **Figure 20**).

On-Road Bicycling

- The American Association of State highway and Transportation Officials (AASHTO) has published a Guide for the Development of Bicycle Facilities (AASHTO, 2012), which states that in rural areas “adding or improving paved shoulders often can be the best way to accommodate bicyclists and benefit motor vehicle traffic.” The guide goes on to recommend a 4’ minimum shoulder width to accommodate bicycle travel.

On-Road Existing Shoulder Widths/Speeds vs. Desired Shoulder Widths/Speeds

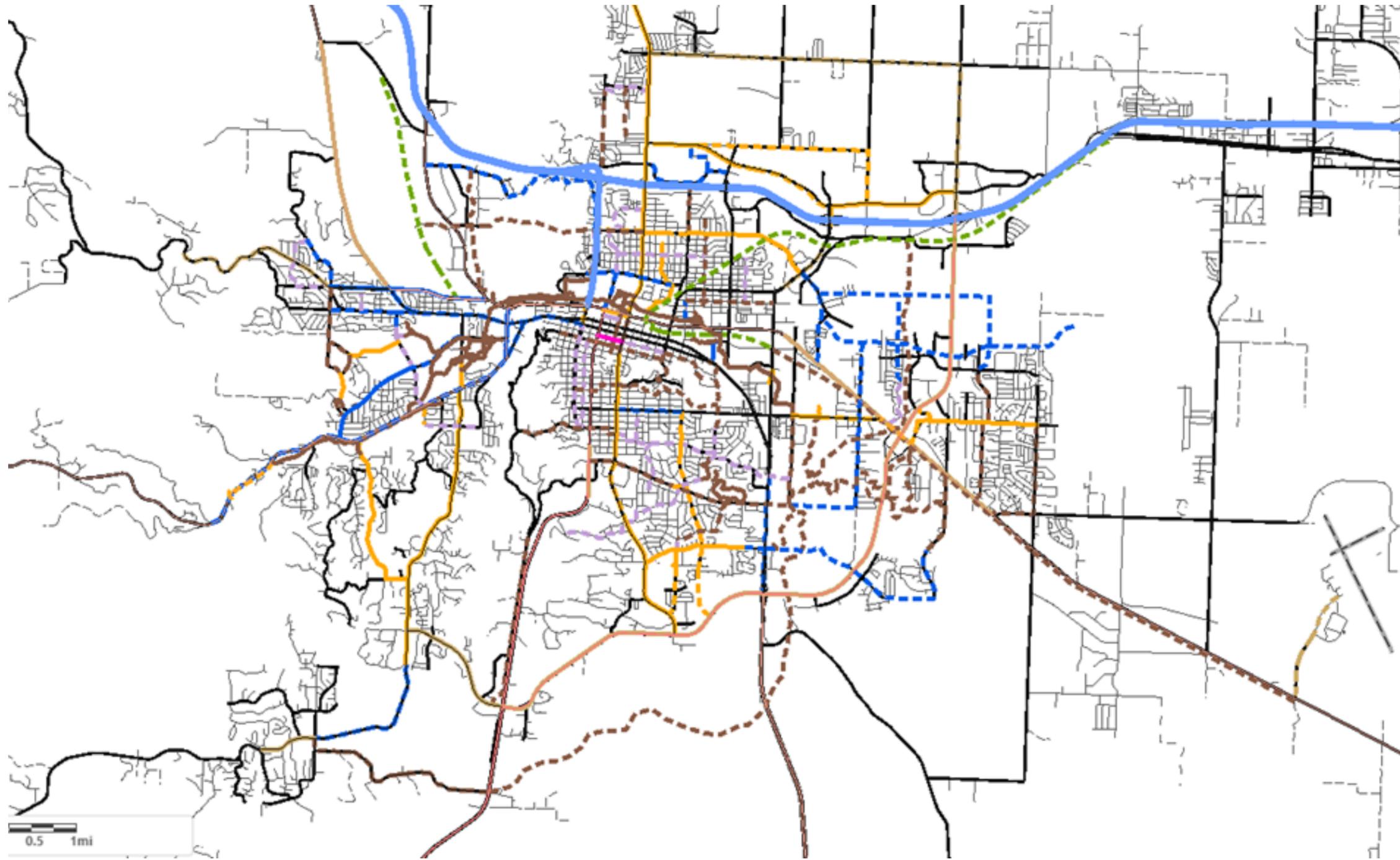
- As shown in **Figure 21**, few County highways possess minimum shoulders for accommodating cyclists, while some of the State highways in the County possess adequate shoulder width. Some County roads were noted by the public during PIM #1 as ideal locations for additional shoulder width, including Upper and Lower Spring Creek Roads, Sheridan Lake Road, and Nemo Road.

Off-Road / Non-Motorized Trail Bicycling

- There are numerous off-street and off-road bicycling trails in rural Pennington County, particularly gravel trails throughout the Black Hills for Mountain bikes. The Mickelson and Centennial on Mystic Trails provide recreational opportunities for off-road cyclists. A paved side path currently

parallels Twilight Drive for approximately 1.6 miles through Rapid Valley. **Figure 22** shows non-motorized/off-road trails and trail heads in Pennington County.

Figure 19 - (Pennington County – Rapid City Area) Bike Lanes, Trails, and Shared Use Paths



Bike Routes					
—■—	Bike Lane, Planned	—■—	Railway Trail, Proposed	—■—	Shoulder Bikeway, Existing
—■—	Bike Lane, Proposed	—■—	Shared Lane, Proposed	—■—	Side Path, Planned
—■—	Bike Lanes, Existing	—■—	Shared Lane, Existing	—■—	Side Path, Proposed
—■—	Bike Path, Existing	—■—	Shared-Use Path, Proposed	—■—	Side Path, Existing
—■—	Cycle Track, Existing	—■—	Shared-Use Path, Existing	—■—	Signed Shared Roadway, Proposed

Figure 20 - The Box Elder Parks and Open Space Master Plan

TRAILS KEY LEGEND:

- 1 Bike lanes and new walks
- 2 Bike route and walks
- 3 Bike paths and trails
- 4 Trails (unpaved)

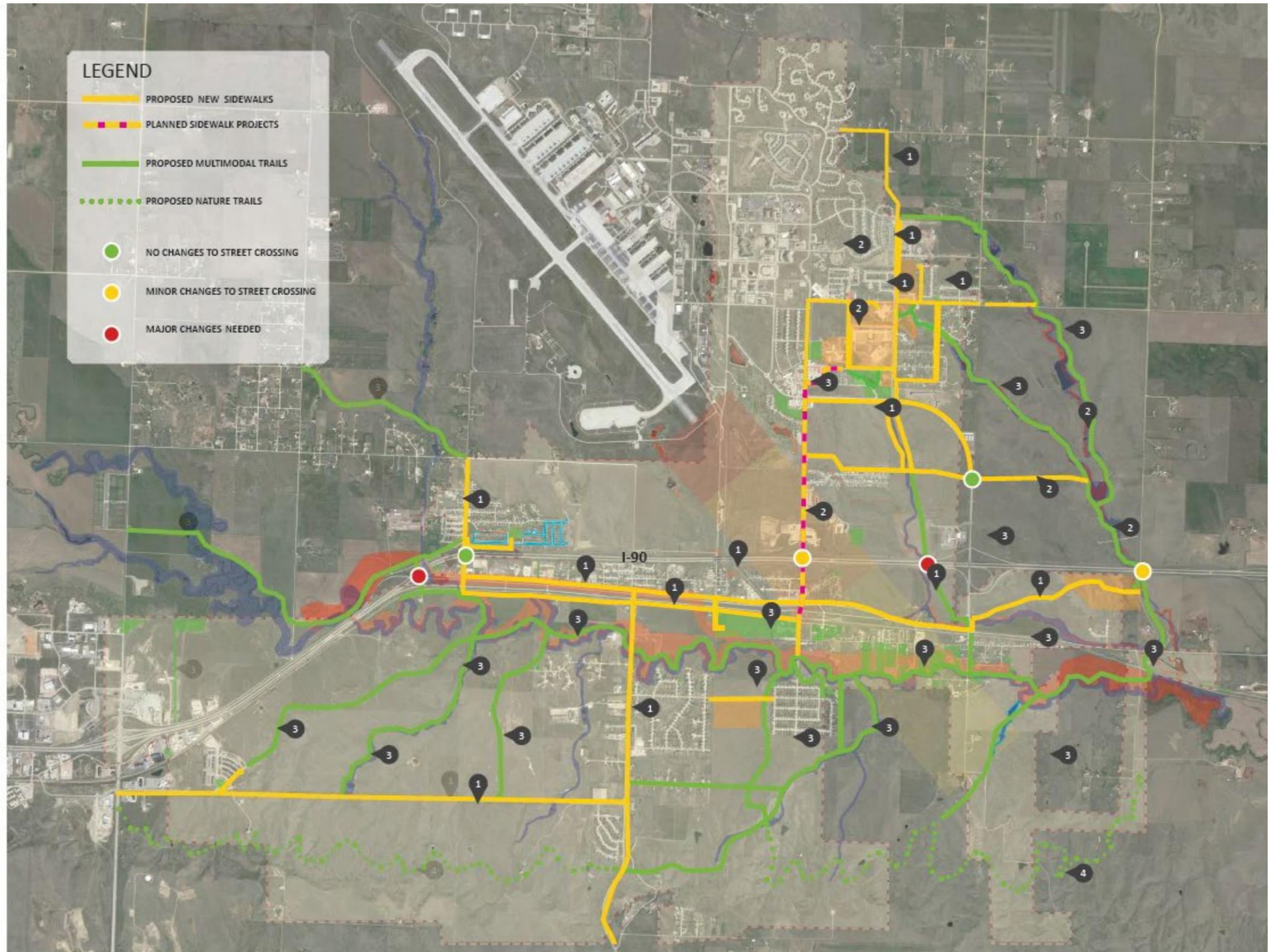
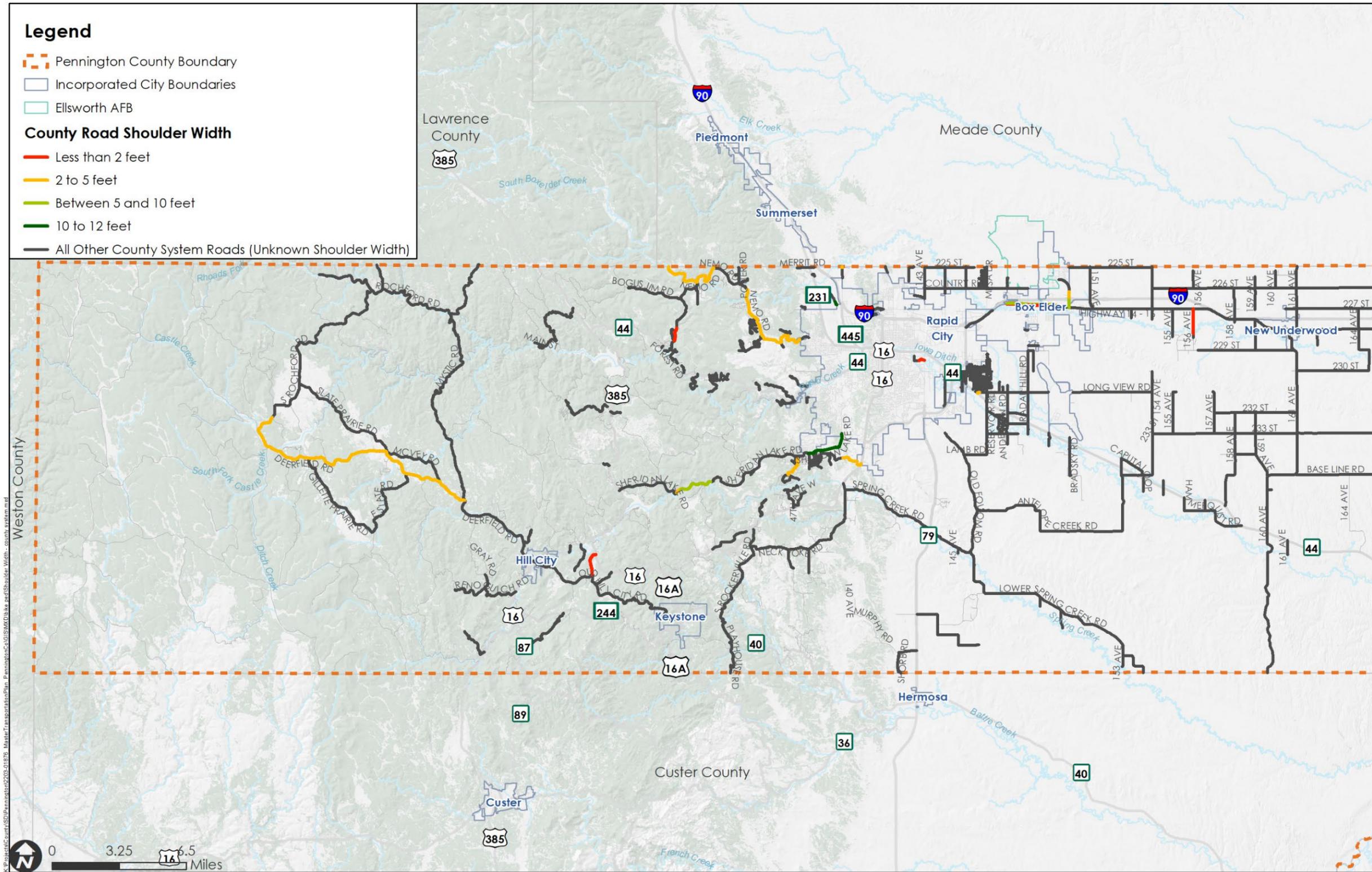


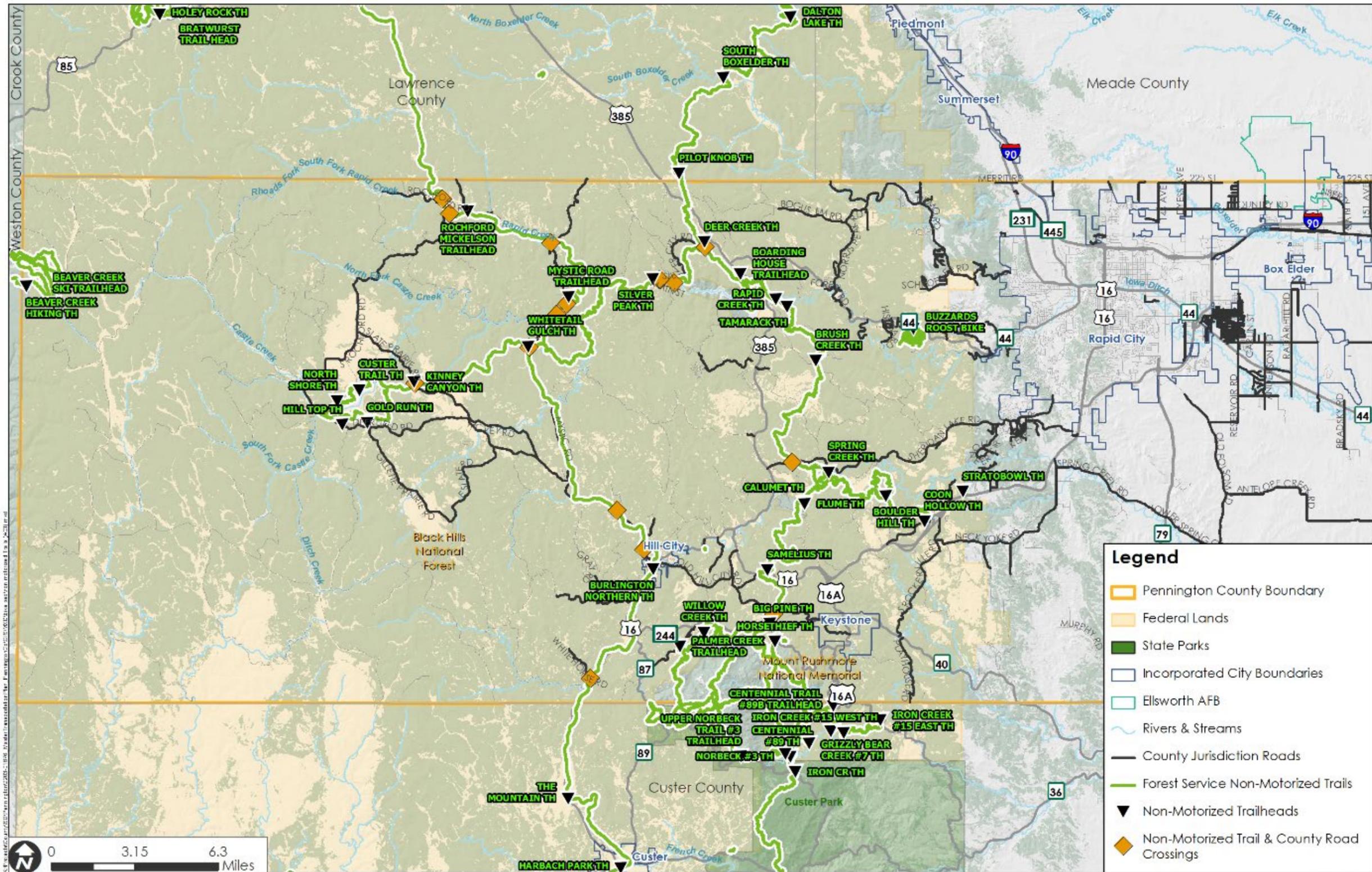
Figure 21 - Road Shoulder Widths in Pennington County



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

September 2023

Figure 22 - (Pennington County – Black Hills Area) Non-Motorized Trails



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

July 2023

Air Transportation

Pennington County has two public use airports, one Air Force base and several private heliports that are used for sightseeing operations and medical flights. The capabilities and location of these facilities are noted below and shown graphically in **Figure 23**. This section of the Report provides more details on air transportation within Pennington County.

Rapid City Regional Airport (RAP)

Rapid City Regional Airport (RAP) is the second busiest airport in South Dakota based on scheduled airline passenger activity. In 2021, (the most recent year with confirmed Revenue Passenger enplanements) the airport had 337,788 enplanements while Sioux Falls (FSD) had 501,321. The next closest airport was Aberdeen (ABR) with 21,850 enplanements. As of 2021 the airport was classified by the FAA as a Small Hub and by the State of South Dakota as a Commercial Service Airport.

The airport currently has 77 based aircraft (59 single engine, 11 multi-engine, 2 jets, and 5 helicopters). The airport has two paved runways. Runway 14/32 which is 8,701' x 150' with a Precision Instrument Approach on the 32 end. Runway 5/23 is 3,601' x 75' in Non-Precision Approaches. The airport is approximately 9 miles east of downtown Rapid City accessed by SD 44. The airport terminal has 7 gates with year-round service to 8 destinations through 4 airlines and additional frequency and other carriers in the summer when tourist activity occurs. The airport accommodates the travel needs of the surrounding area including western South Dakota, Eastern Wyoming, the Panhandle of Nebraska and Southeast Montana. In addition, it accommodates the tourist activity to see the natural and cultural sites throughout the region, including the Mount Rushmore National Memorial, Custer State Park, Black Hills National Forest, Devils Tower National Monument, and Badlands National Park.

Air Traffic is controlled by an FAA contract tower at the airport that operates from 6:00 am to 10:00 pm. Approach and Departure control are provided by EAFB. While this is not yet an impending land use problem, please note that immediately east of RAP is a private-use airport known as *Dan's Airport* (4SD4). This private airstrip has a 2,400' x 100' Turf Runway 13/31 which has only a 2,000' centerline separation from RAP's runway 14/32. Air Traffic control must coordinate use of 4SD4 to not conflict with activity at RAP.

Access to RAP: From Rapid City and northwest, access to RAP is provided via State Hwy 44 and I-90/US Hwy 14 to US Hwy 16 to State Hwy 44. From the west and south, access is utilized via State Hwy 44, and US Hwy 16 and State Hwy 79 which both lead to State Hwy 44. From the east and north, access to the airport is also State Hwy 44, and I-90/US Hwy 14 or State Hwy 1416 via Radar Hill Road.

Radar Hill Road (County jurisdiction) is an identified area of growth with increasing traffic volumes because of recent residential subdivision growth. Radar Hill Road is the main collector route providing airport access for the growing community of Box Elder and EAFB.

Wall Municipal Airport

Wall Municipal Airport (6V4) is a general aviation airport immediately west of the City of Wall. The airport has two runways. The airport is currently completing a major reconstruction of its primary runway through the summer of 2023. Upon completion the airport will have Runway 13/31 which will be 4,418' x 75' with Visual Approaches and Runway 18/36 as a turf crosswind which is 2,000' x 100'. The airport has 13 based

aircraft which are all single-engine aircraft. The FAA classifies 6V4 as a Basic Airport and the State of South Dakota classifies the airport as a Small General Aviation Airport.

Ellsworth Air Force Base

Ellsworth Air Force Base (RCA) is located north of the City of Box Elder and is operated by the U.S. Air Force for the purpose of national defense. It is not open to the public but the air traffic controllers at the Ellsworth provide Approach and Departure control for the area included RAP, RCA and other airports in the vicinity during the day. RCA has one runway 13/31 which is 13,497' x 300' with a Precision Instrument Approach on both ends.

Heliports

There are three Private Heliports in Pennington County used for sightseeing activity as well as one hospital heliport. Two additional heliports are in the area for sightseeing and are in Custer County near Crazy Horse Memorial (Crazy Horse Heliport OSD9) and in Jackson County near Badlands National Park (Badlands Heliport SD69) but are not included in this list. These Pennington County heliports are as follows:

Rushmore Heliport (SD42)

Rushmore heliport is located on a hill north of Reed Street near downtown Keystone. The heliport has two landing pads with adjacent parking positions.

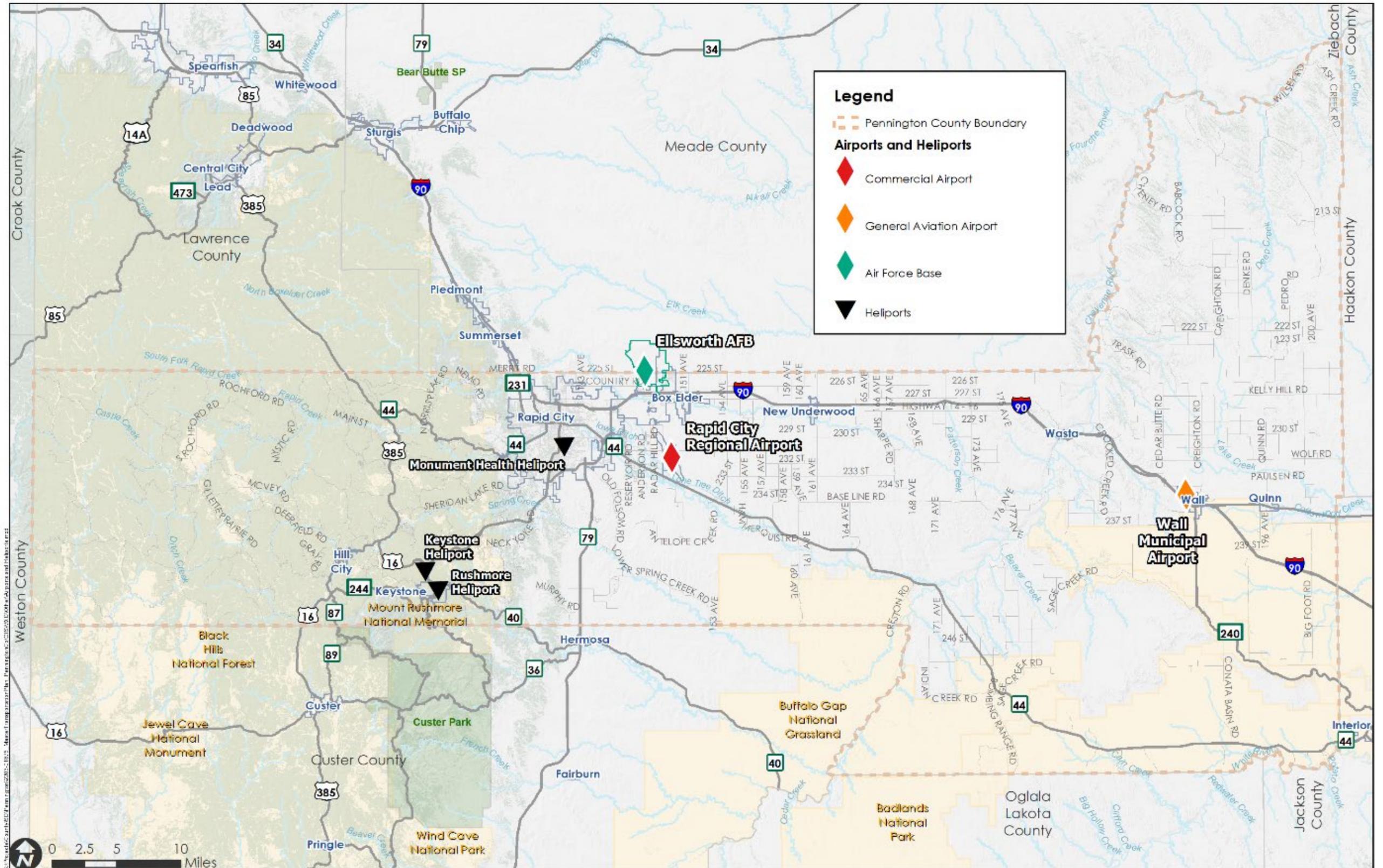
Keystone Heliport (SD18)

Keystone Heliport is located on a hill west of Highway 16A approximately 2 miles north of Keystone. The heliport has one landing pad with adjacent parking positions.

Monument Health Rapid City Hospital Heliport

Monument Hospital Heliport is located at 353 Fairmont Boulevard on the roof of the hospital. There is one landing pad on the roof with no additional parking positions.

Figure 23 - Airports and Heliports in Pennington County



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLIJ

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Transit

Parts of Pennington County that are within Rapid City limits are served by Rapid Transit System/Rapid Ride (<https://www.rapidride.org/> – Rapid City, SD); Two other regional transit systems provide limited service to Pennington County within Rapid City; Prairie Hills Transit (Spearfish, SD); and River Cities Transit (Pierre, SD).



The project team solicited existing fixed route and on-demand service data from each agency to inventory current transit operations and issues in Pennington County.

RapidRide Fixed Routes & Dial-A-Ride On Demand Services

RapidRide has been providing fixed route public transportation services in Rapid City since 1992. Operating on six different fixed routes, RapidRide provides timely service to many convenient locations throughout Rapid City. All RapidRide routes run on 35-minute frequencies. (Note that the school route is currently discontinued).

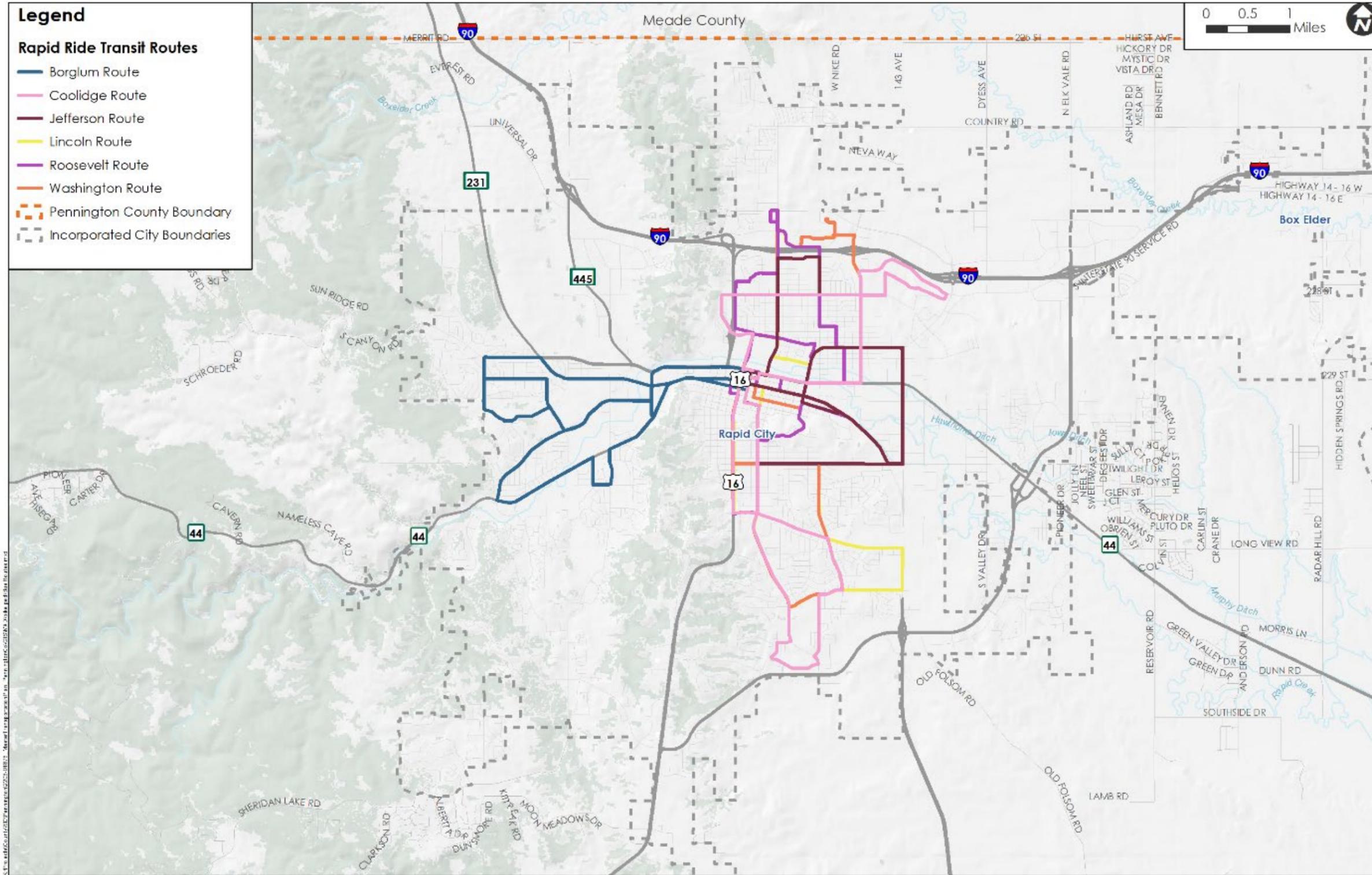
Transit providers servicing Pennington County are summarized in **Table 5** and Rapid City Transit / RapidRide fixed routes are depicted graphically in **Figure 24**.

Table 5 - Top 10 Pennington County Transit Services

ID	Agency	Locations	Services			
			Fixed Route	On Demand	Service From	Service To:
1	Rapid Transit System (RTS) / RapidRide	Rapid City, SD	Yes	Yes (Rapid Ride)	Rapid City	Rapid City
2	Prairie Hills Transit	Spearfish, SD	Yes, limited	Yes	Spearfish	Rapid City
3	River Cities Transit	Pierre, SD	Yes, Limited	Yes	Pierre	Rapid City

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Figure 24 - Rapid Transit System's RapidRide Fixed Routes Serving Rapid City, SD



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

August 2023

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EXISTING TRANSPORTATION POLICY & ORDINANCES

The county requested the MTP examine and evaluate current county transportation policies, procedures, and ordinances. The county also asked for recommendations of possible changes to existing codes or departmental policies. A listing of recommendations is listed in chapter 5.

Recently, the Pennington County Planning Staff has implemented processes to improve efficiencies and reduce the wait times for reviewing and processing applications; notwithstanding, the public notice and hearings required by state law. Involving other departments such as the highway department early in the process is wise and addresses transportation issues earlier. The county has detailed ordinances that provide technical guidance, public health and safety standards, and sound policies to ensure growth is developed in a manner that is consistent with environmental, engineering, and efficiency for those using the property. Additionally, the standards align with the 2020 Plan.

The county's website is very navigable, and the ordinances are very accessible. The Development Guide is an excellent document that explains the processes for subdivision and land use applications, particularly regarding transportation planning.

Chapter 5 includes recommendations for improving existing transportation policy. The recommendations may assist in putting the comprehensive plan and the master transportation plan into action. They include the following: Engineering Study, UTV/ATV, Buffering and Mitigation of Impacts, Bicycle/Pedestrian, Traffic Impact Studies, Safety Audits, Access Management, Right to Farm Covenants, Joint Jurisdictional Ordinances, Signage, Development Fees/Costs, County Website, Comprehensive Plan, Development Guide, GIS/Mapping, and Rural Living.

The Pennington County website has a link to Permits and Ordinances. This provides the public access to the various documents and information required by the highway department for permits and requirements for activities involving the county highway system. The most recent ordinance is Amended Ordinance #14 (Effective July 27, 2022). It is a comprehensive ordinance that provides definitions, criteria, standards and procedures for construction, acceptance of roads, and installation of approaches onto the county highway system. It also states the maintenance requirements, standards for exceptions to the standards, and the applicable fees.

2020 Pennington County Comprehensive Plan

The 2020 Comprehensive plan provides goals, objectives, and recommendations that provide a framework for Pennington County's policy-making that should align with planning documents. If ordinances and procedures put the comprehensive plans into action, then decision making is consistent, transparent, and equally applied. There will be exceptions, but they will have solid justifications and sound rationale in those rare occasions.

It is worth noting that the City of Box Elder is in the process of updating their comprehensive plan. The City of Rapid City is scheduled to start updating their plan in 2024, Hill City's Comprehensive plan was completed in 2017 and Wall's was done in 2020. Each municipal comprehensive plan has a relationship with Pennington County's plan. They include maps and illustrations of potential growth areas in and out of the current city limits, possible alignment of city and county roads, infrastructure limitations, and possible policies to integrate a transition from rural to urban. Mitigation strategies may also be included.

The 2020 Pennington County Comprehensive Plan divided the county into three focus areas: Central Pennington, Eastern Plains, and Black Hills. Each of these areas have unique characteristics, geography, economies, and growth patterns.

Central Pennington: consists of the Rapid City/Box Elder metropolitan area including Ellsworth Air Force Base (EAFB). As mentioned earlier, the EAFB is anticipating a major expansion in military and civilian personnel. Therefore, there will be a demand for a variety of housing types, density, and affordability of housing. Additional population usually means more commercial and industrial development too. The Rapid City metro area will continue to grow because it's the regional hub for health care, commerce, and entertainment, thus additional demands will be placed on all transportation systems.

Eastern Plains: This is the eastern half of the county from the MPO boundary to the county line, including New Underwood, Quinn, Wall, Wasta, unincorporated communities, the Badlands, and the Buffalo Gap Grasslands. The growth has not been as significant. However, the area's agricultural activities need roads that accommodate large trucks and farm vehicles that access land, farms, ranches, and markets. Interstate 90 and Highway 44 are the main throughfares, so access management between the SDDOT, county, and townships is important. Also, cooperation of the communities is important so the transition from municipal to county roads is adequately maintained and safe.

Black Hills: This area is west of the RCAMPO, including Keystone and Hill City. Most of this area is owned by the US Forest Service. Many of the state highways and Forest Service trails intersect with county roads. The area consists of open space, ranchettes, acreages, and large lot residential, along with commercial and industrial properties along the highways. Connectivity and access from development to county and state highways can be the challenge due to terrain, public lands, and other physical barriers. Moreover, growth in this area should be managed to preserve the beauty of the Black Hills landscape.

CHAPTER 4 – EXISTING TRAFFIC CONDITIONS: VOLUMES, OPERATIONS, AND SAFETY

TRAFFIC VOLUMES

Existing Traffic Volumes (2023)

Annual Average Daily Traffic (AADT) is the traffic volume based on a 24-hour, two-directional count at a given location. The data is then statistically corrected by a seasonal variation factor that considers time of year and day of the week. AADT is a useful and simple measurement of how busy a road is. The AADT traffic data can be used for:

- Selecting a new site or facility location, evaluating a site, or designing a roadway facility,
- Determining funding for highway maintenance and improvement,
- Forecasting road maintenance needs and expenditure,
- Identifying the best location for businesses based on traffic patterns,
- Analyzing how temporary construction may impact traffic, and
- Analyzing the environmental hazards of pollution related to road transport.

The highest recorded traffic volumes surround the I-90 corridor in the northern portion of the County and within the vicinity of Rapid City. Some of the high traffic volume roadways include Liberty Blvd, Twilight Dr, and Sheridan Lake Rd. Traffic volumes are lower in the rural areas of the County.

Daily Vehicular Volumes

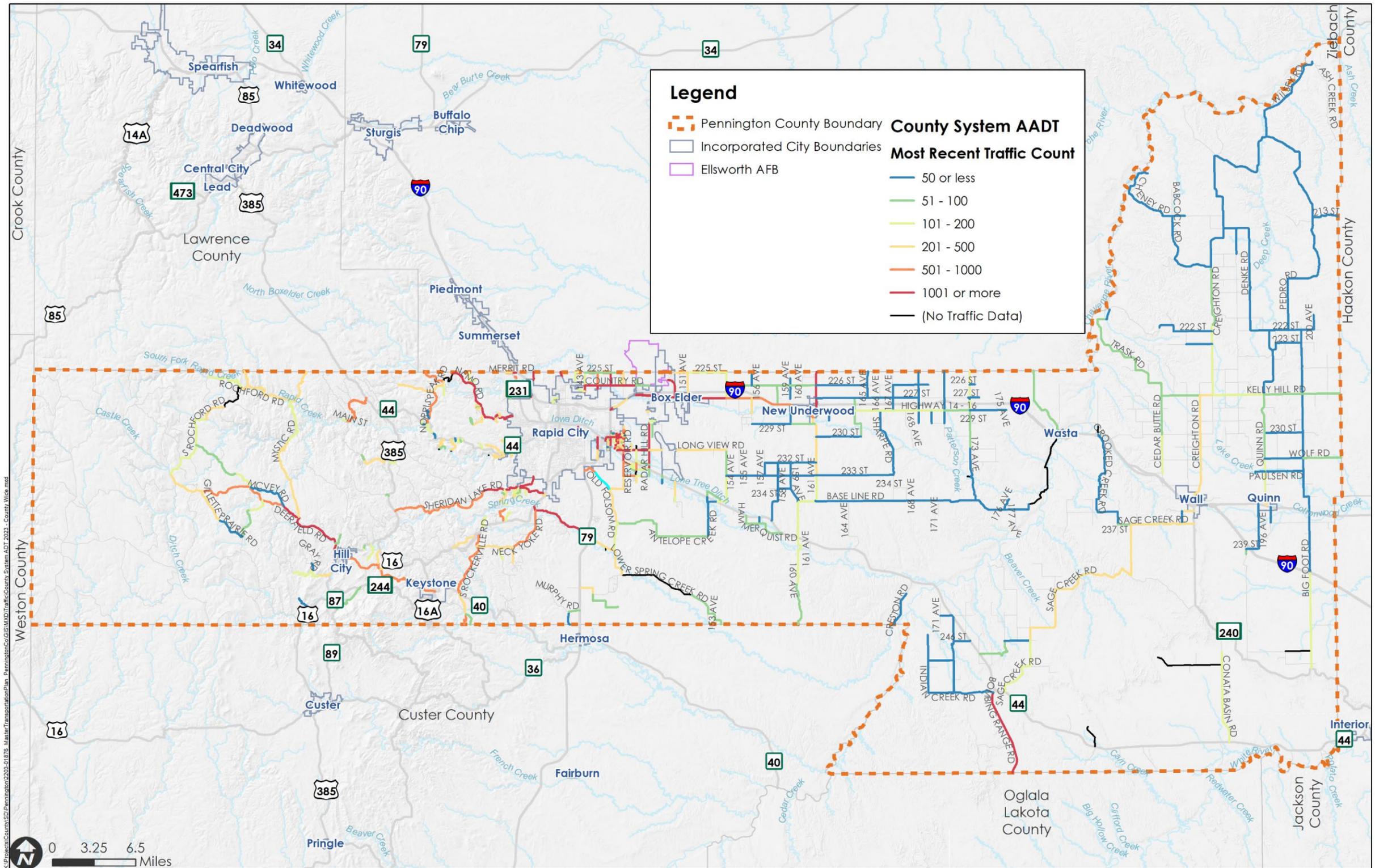
The most recent traffic counts on the Federal, State, and County roadway segments within the study area were sourced from the SDDOT and the Pennington County Highway Department. Traffic counts recorded after 2020 were used as counts for 2023. Any traffic counts recorded before 2021 were projected to 2023 using the methodologies discussed in the **Future Traffic Projections** section of the report. Traffic counts on a few roadway segments were collected by KLJ Engineering. The existing traffic count data on the roadway segments in the study area are shown in **Figure 25**.

Truck Traffic Volumes

The major freight movement in the region is by trucks and trains. Interstate 90, the US Hwy 16 Bypass, and SD Hwy 79 are considered major truck routes in the region. **Figure 26** illustrates the daily truck volumes in the County.

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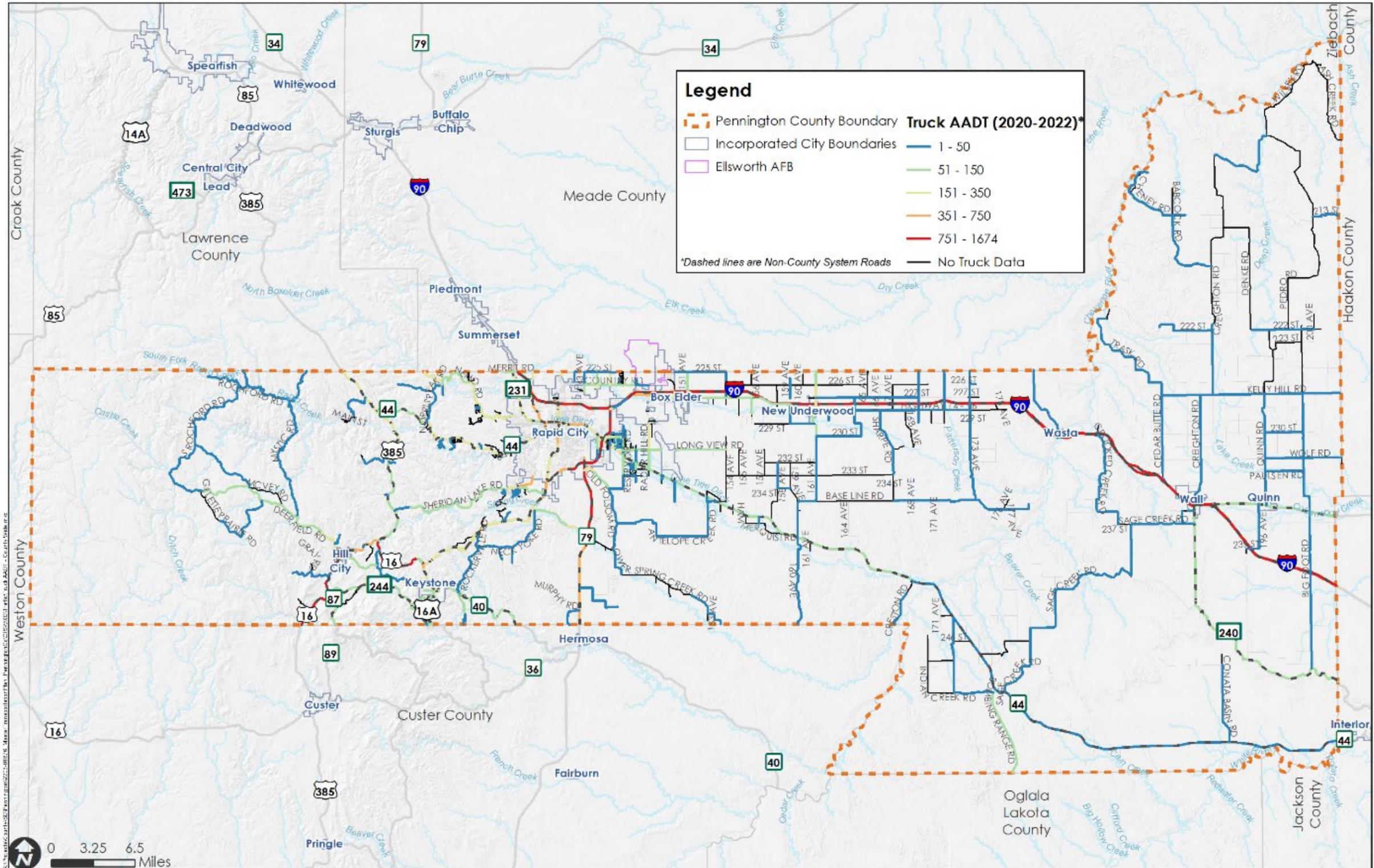
Figure 25 - Existing (2023) Traffic Volumes in the Study Area



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

December 2022

Figure 26 - Existing Truck Traffic Volumes in the Study Area



Turning Movement Counts

Turning Movement Counts (TMCs) are traffic volumes collected at intersections. The count includes the number of motorized vehicles that are turning right, proceeding through, or turning left. It also includes pedestrian and bicyclists crossing from each approach through the intersection. TMCs are used for a variety of intersection analyses, including traffic operations analyses, intersection design, and transportation planning applications. For many planning and design applications, especially in the case of proposed future improvements to an intersection or even proposed new intersections, future year TMCs are needed for the analysis.

Fifteen intersections were shortlisted due to their heightened significance according to the County Highway Department and underscore a strategic focus on comprehensive transportation planning. The following 15 intersections were selected for in-depth traffic operations and safety evaluation after extensive deliberations with the Pennington County Highway Department staff. These 15 study intersections are also shown in **Figure 27**.

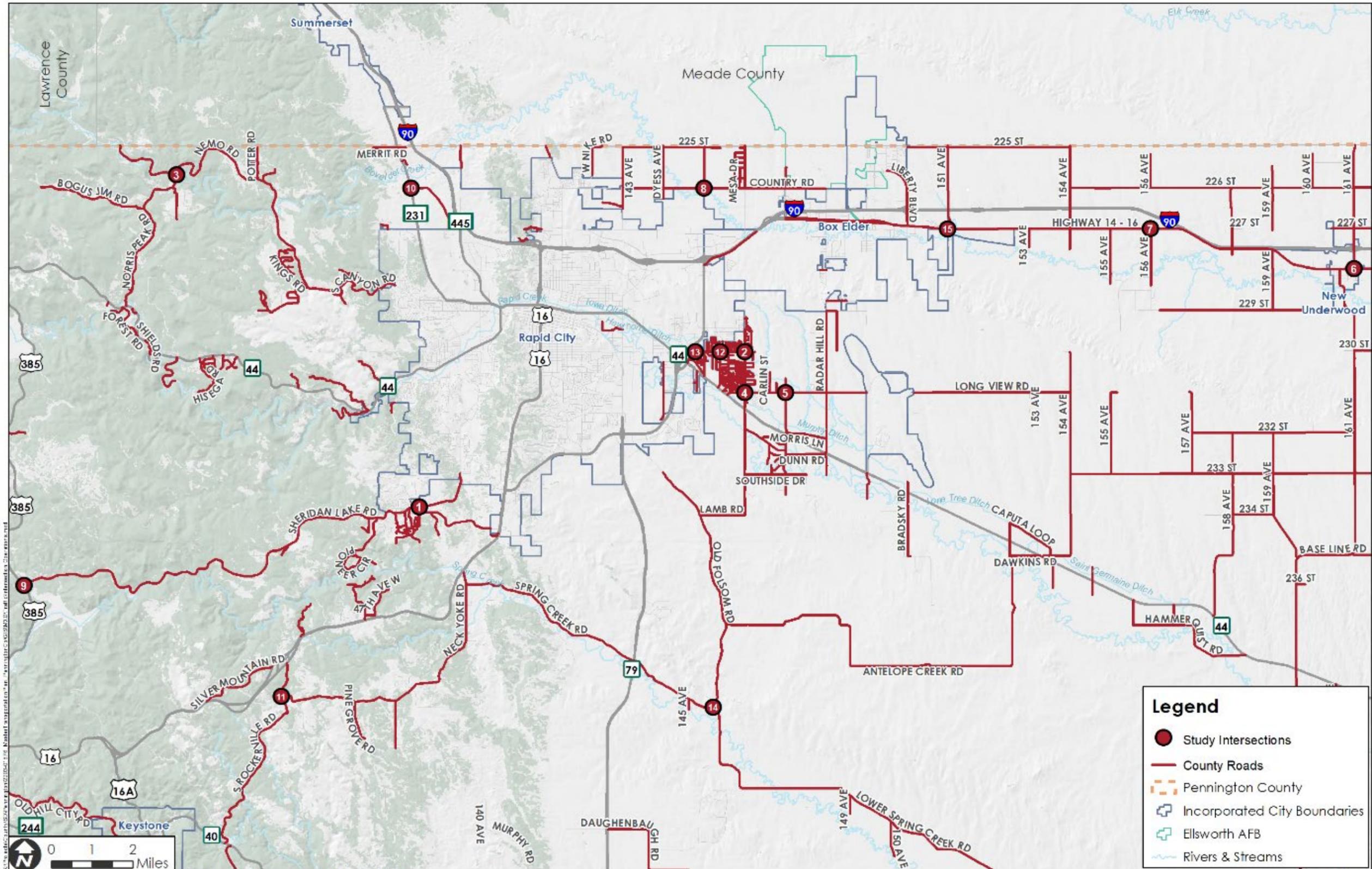
1. Sheridan Lake Rd & Dunsmore Rd
2. Twilight Dr & Reservoir Rd
3. Nemo Rd & Norris Peak Rd
4. Longview Rd & Reservoir Rd
5. Anderson Rd & Longview Rd
6. 161st Ave & Hwy 1416
7. 156th Ave & Hwy 1416
8. Country Rd & Elk Vale Rd
9. Sheridan Lake Rd & Hwy 385
10. Universal Dr & Sturgis Rd
11. Neck Yoke Rd & S Rockerville Rd
12. Covington St & Twilight Dr
13. Concourse Rd & Twilight Dr
14. Old Folsom Rd & Lower Spring Creek Rd
15. 151st Ave & Hwy 1416

The project team collected 24-hour TMCs for the 15 study intersections within the Pennington County study area. TMCs were conducted while school was still in session in June 2023. Peak hour volumes for all study intersections were determined on a per-intersection basis and representative of the AM and PM peak hours. Following the data collection, PTV Vistro software was used to analyze current level of service (LOS) for the intersections. The results of this analysis are provided later in this chapter of this report.

This data was used as a baseline for analysis of future traffic conditions and development of project recommendations, as presented later in this document. The TMCs for the 15 study intersections are listed in **Table 6**

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Figure 27 - Location of the Study Intersections where TMC were collected



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

July 2023

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Table 6 – 2023 Turning Movement Counts

AWSC – All-way Stop Control; SSSC - Side Street Stop Control; L – Left, T - Through, R - Right. Refer to **Figure 27** for the location of the Intersection by ID.

ID	Intersection	Control	Peak	Northbound			Southbound			Eastbound			Westbound		
				L	T	R	L	T	R	L	T	R	L	T	R
1	Sheridan Lake Rd & Dunsmore Rd	Signal	AM	20	9	51	237	59	6	6	466	75	11	111	58
			PM	61	32	30	137	20	9	14	286	30	59	383	184
			Daily	399	276	411	1468	298	130	105	3178	354	439	3098	1511
2	Twilight Dr & Reservoir Rd	AWSC	AM	89	101	4	1	59	112	24	10	21	7	29	2
			PM	74	60	5	4	52	93	28	10	26	4	22	0
			Daily	561	628	65	28	660	490	490	189	466	48	198	22
3	Nemo Rd & Norris Peak Rd	SSSC	AM	7	0	19	0	0	0	0	26	7	6	22	0
			PM	12	0	5	0	0	0	0	26	9	20	44	0
			Daily	79	0	143	0	0	0	0	325	89	159	360	0
4	Longview Rd & Reservoir Rd	AWSC	AM	2	15	2	34	24	101	15	35	2	3	195	51
			PM	4	27	3	63	22	60	124	220	1	4	122	55
			Daily	35	229	33	491	315	862	922	1497	40	30	1605	474
5	Anderson Rd & Longview Rd	SSSC	AM	1	1	2	0	1	3	2	58	2	2	115	3
			PM	4	0	1	3	0	1	4	145	4	3	106	1
			Daily	41	10	24	6	9	41	36	1142	46	18	1195	14
6	161st Ave & Hwy 1416	SSSC	AM	0	0	0	8	0	31	49	14	0	0	26	20
			PM	0	0	0	18	0	53	115	12	0	0	13	9
			Daily	0	0	0	142	0	557	610	211	0	0	207	133
7	156th Ave & Hwy 1416	SSSC	AM	49	0	6	0	0	0	0	23	7	1	27	0
			PM	21	0	1	0	0	0	0	31	39	2	15	0
			Daily	247	0	35	0	0	0	0	302	250	30	280	0

ID	Intersection	Control	Peak	Northbound			Southbound			Eastbound			Westbound		
				L	T	R	L	T	R	L	T	R	L	T	R
8	Country Rd & Elk Vale Rd	SSSC	AM	9	22	29	5	106	4	2	17	29	40	15	2
			PM	35	81	55	4	45	1	8	29	28	53	26	11
			Daily	284	783	543	44	818	31	50	255	304	595	235	41
9	Sheridan Lake Rd & Hwy 385	SSSC	AM	0	120	18	15	180	0	0	0	0	26	0	10
			PM	0	136	24	13	144	0	0	0	0	27	0	17
			Daily	0	1559	313	169	1514	0	0	0	0	373	0	177
10	Universal Dr & Sturgis Rd	SSSC	AM	1	175	21	117	332	0	0	0	2	12	0	33
			PM	1	376	17	75	294	0	0	1	1	26	0	149
			Daily	12	3810	259	1108	3575	1	1	3	8	231	0	1223
11	Neck Yoke Rd & S Rockerville Rd	SSSC	AM	0	24	0	8	29	0	0	0	0	5	0	9
			PM	0	33	6	17	18	0	0	0	0	3	0	6
			Daily	0	314	36	117	316	0	0	0	0	42	0	136
12	Covington St & Twilight Dr	SSSC	AM	47	0	12	0	0	0	0	100	32	13	402	0
			PM	30	0	25	0	0	0	0	417	59	23	238	0
			Daily	466	0	241	0	0	0	0	3043	489	248	3290	0
13	Concourse Rd & Twilight Dr	SSSC	AM	6	0	0	53	0	17	44	94	5	0	295	91
			PM	2	2	0	222	2	26	74	355	7	1	193	47
			Daily	51	30	3	1671	28	292	715	2662	48	6	2567	600
14	Old Folsom Rd & Lower Spring Creek Rd	SSSC	AM	0	0	0	2	0	2	0	16	0	0	31	11
			PM	0	0	0	10	0	0	2	27	0	0	15	4
			Daily	0	0	0	67	0	30	21	239	0	0	242	65
15	151st Ave & Hwy 1416	SSSC	AM	0	0	0	5	0	34	7	38	0	0	94	8
			PM	0	0	0	3	0	15	36	84	0	0	50	1
			Daily	0	0	0	48	0	263	245	615	0	0	619	41

Future Traffic Projections

A 2045 Transportation Model was developed by the Rapid City Metropolitan Planning Organization (MPO) to predict the adequacy and appropriateness of the roadway system to accommodate the forecasted level of household and employment growth in in the MPO boundary. The 2045 Transportation Model assumed the 2045 projected level of employment, household, and population growth, and the completion of projects within Pennington County and Meade County's current transportation improvement plan. The traffic projection factors developed in the MPO's Transportation Model were used to project 2030 and 2045 traffic volumes for county roads within the MPO boundary.

For county roads outside of the MPO boundary area, the project team projected traffic volumes using the SDDOT growth factors. In 2021, SDDOT published 20, 25 and 30-year traffic projection factors for different Counties. The 20-year traffic projection factors for Penning County are 1.742 and 1.451 for urban and rural arterials/collectors/local roads, respectively, however it was necessary to convert this to an annual growth rate to establish 2030 and 2045 traffic conditions.

Future Daily Traffic Volumes

The projected 2030 and 2045 traffic counts on the County roadway segments within the study area are shown in **Figure 28** and **Figure 29**, respectively.

Future Truck Traffic Volumes

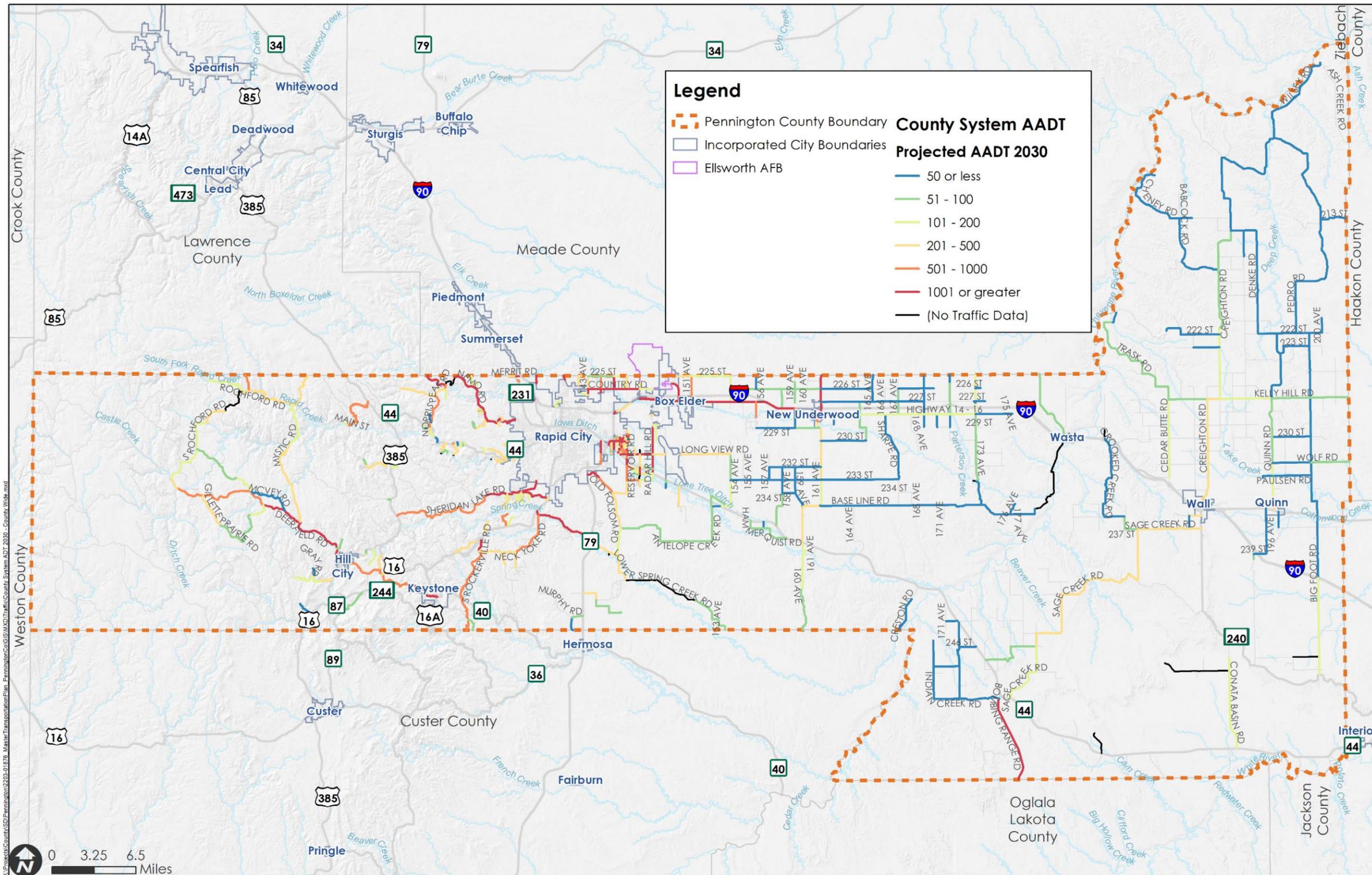
The same growth factors used for all vehicle types were used for trucks. **Figure 30** and **Figure 31** illustrates the projected 2030 and 2045 daily truck volumes in the County, respectively.

Future Turning Movement Counts

The projected 2030 and 2045 turning movement counts at the 15 study intersections are shown in **Table 7** and **Table 8**, respectively. Note that the traffic projections for the intersection of Sheridan Lake Rd with Dunsmore Rd from the 2045 MPO Transportation Model were relatively low compared to anecdotal and local knowledge. For these reasons, the annual traffic growth factor at the intersection obtained from the MPO model were doubled to account for the more appropriate future traffic volumes.

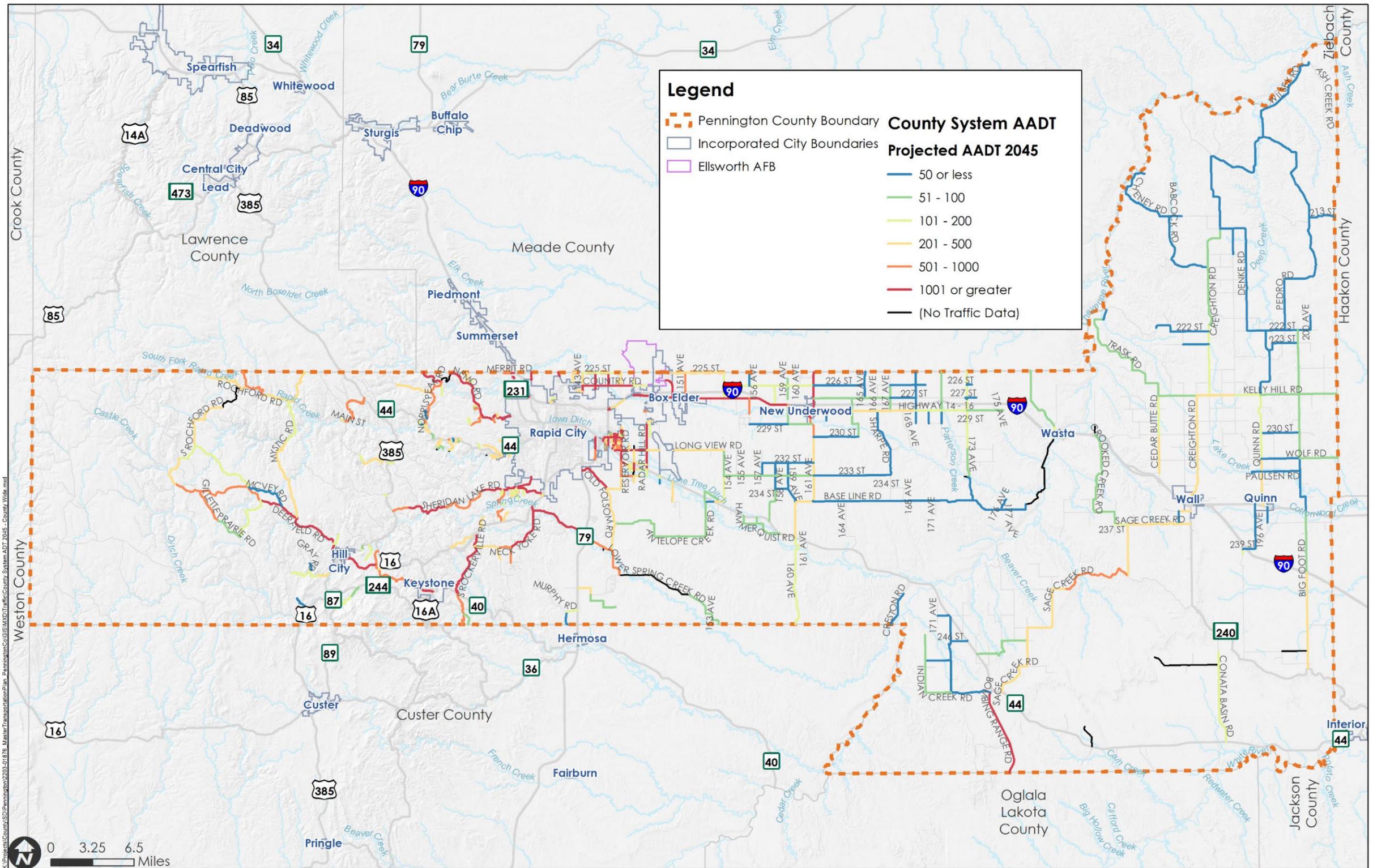
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Figure 28 – Projected 2030 Traffic Volumes in the Study Area



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLI

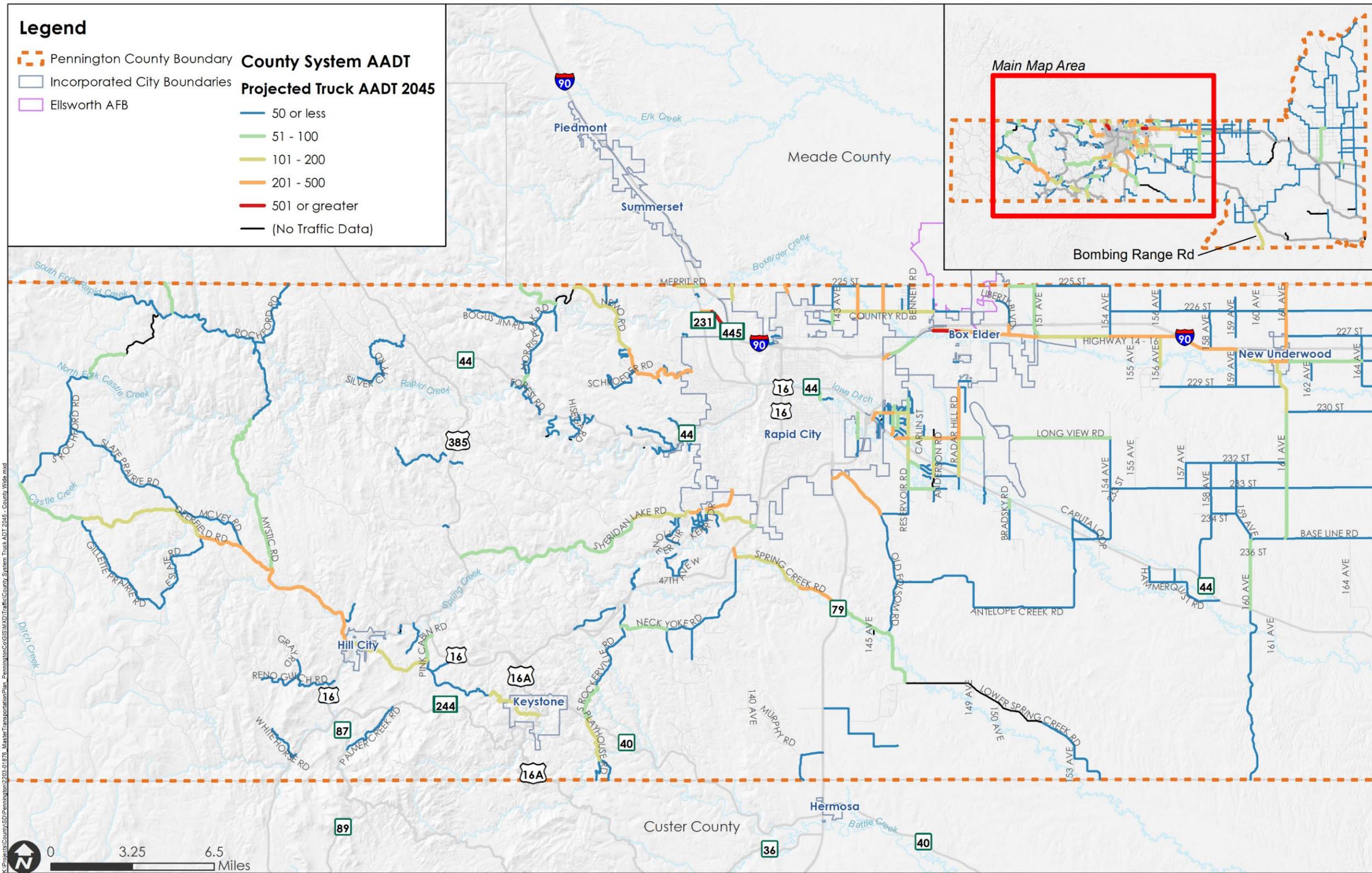
Figure 29 – Projected 2045 Traffic Volumes in the Study Area



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLLJ

December 2023

Figure 31 - 2045 Truck Traffic Volumes in the Study Area



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

December 2023

Table 7 - Projected 2030 Turning Movement Counts

AWSC – All-way Stop Control; SSSC - Side Street Stop Control; L – Left, T - Through, R - Right. Refer to Figure 27 for the location of the Intersection by ID.

ID	Intersection	Control	Peak	Northbound			Southbound			Eastbound			Westbound		
				L	T	R	L	T	R	L	T	R	L	T	R
1	Sheridan Lake Rd & Dunsmore Rd	Signal	AM	26	13	67	253	63	8	8	574	93	15	137	72
			PM	81	42	40	147	22	11	18	352	38	73	473	228
			Daily	517	358	533	1560	318	140	131	3910	436	541	3812	1859
2	Twilight Dr & Reservoir Rd	AWSC	AM	96	115	5	1	67	122	26	11	23	8	32	2
			PM	80	69	6	5	59	102	31	11	28	5	25	0
			Daily	604	718	76	33	752	535	534	212	504	55	221	23
3	Nemo Rd & Norris Peak Rd	SSSC	AM	8	0	21	0	0	0	0	29	8	7	25	0
			PM	13	0	6	0	0	0	0	29	10	22	49	0
			Daily	88	0	159	0	0	0	0	362	98	177	401	0
4	Longview Rd & Reservoir Rd	AWSC	AM	2	17	2	39	27	113	17	41	2	3	226	59
			PM	5	30	3	72	25	67	139	255	1	5	141	64
			Daily	38	257	36	564	353	965	1029	1733	44	33	1858	548
5	Anderson Rd & Longview Rd	SSSC	AM	1	1	2	0	1	4	2	70	2	2	139	4
			PM	5	0	0	2	2	2	7	171	4	2	130	1
			Daily	46	11	26	6	10	48	43	1375	55	20	1441	15
6	161st Ave & Hwy 1416	SSSC	AM	0	0	0	9	0	35	56	16	0	0	30	23
			PM	0	0	0	20	0	60	131	14	0	0	15	10
			Daily	0	0	0	161	0	632	692	239	0	0	235	151
7	156th Ave & Hwy 1416	SSSC	AM	56	0	7	0	0	0	0	26	8	1	31	0
			PM	24	0	1	0	0	0	0	35	44	2	17	0
			Daily	280	0	39	0	0	0	0	341	283	31	315	0
8	Country Rd & Elk Vale Rd	SSSC	AM	10	23	33	6	111	4	2	20	32	45	18	2
			PM	39	85	62	4	47	1	9	34	31	59	31	12
			Daily	313	819	615	47	857	31	53	300	333	664	277	45

ID	Intersection	Control	Peak	Northbound			Southbound			Eastbound			Westbound		
				L	T	R	L	T	R	L	T	R	L	T	R
9	Sheridan Lake Rd & Hwy 385	SSSC	AM	0	136	20	17	204	0	0	0	0	30	0	11
			PM	0	154	27	15	164	0	0	0	0	31	0	19
			Daily	0	1770	353	190	1720	0	0	0	0	422	0	199
10	Universal Dr & Sturgis Rd	SSSC	AM	1	176	22	121	334	0	0	0	2	12	0	34
			PM	1	378	18	78	296	0	0	1	1	27	0	154
			Daily	12	3835	269	1148	3596	1	1	3	8	236	0	1264
11	Neck Yoke Rd & S Rockerville Rd	SSSC	AM	0	27	0	9	33	0	0	0	0	5	0	10
			PM	0	37	7	18	20	0	0	0	0	3	0	7
			Daily	0	356	37	124	359	0	0	0	0	44	0	150
12	Covington St & Twilight Dr	SSSC	AM	52	0	13	0	0	0	0	103	36	13	412	0
			PM	33	0	28	0	0	0	0	428	66	24	244	0
			Daily	517	0	268	0	0	0	0	3121	543	250	3374	0
13	Concourse Rd & Twilight Dr	SSSC	AM	7	0	0	59	0	19	50	98	6	0	306	101
			PM	2	2	0	246	2	29	84	369	8	1	200	52
			Daily	56	35	3	1851	33	331	810	2763	53	6	2665	665
14	Old Folsom Rd & Lower Spring Creek Rd	SSSC	AM	0	0	0	2	0	2	0	18	0	0	35	12
			PM	0	0	0	11	0	0	2	31	0	0	17	5
			Daily	0	0	0	75	0	31	22	272	0	0	275	71
15	151st Ave & Hwy 1416	SSSC	AM	0	0	0	6	0	38	8	39	0	0	96	8
			PM	0	0	0	3	0	17	40	86	0	0	51	1
			Daily	0	0	0	43	0	252	234	544	0	0	547	35

Table 8 - Projected 2045 Turning Movement Counts

AWSC – All-way Stop Control; SSSC - Side Street Stop Control; L – Left, T - Through, R - Right. Refer to Figure 27 for the location of the Intersection by ID.

ID	Intersection	Control	Peak	Northbound			Southbound			Eastbound			Westbound		
				L	T	R	L	T	R	L	T	R	L	T	R
1	Sheridan Lake Rd & Dunsmore Rd	Signal	AM	39	17	99	277	69	7	11	794	128	19	190	99
			PM	119	63	59	160	25	10	24	487	52	102	652	314
			Daily	774	535	796	1718	348	153	178	5404	603	748	5269	2571
2	Twilight Dr & Reservoir Rd	AWSC	AM	115	154	7	2	90	149	32	14	27	12	42	3
			PM	96	91	8	7	79	124	37	14	34	7	32	0
			Daily	723	956	109	47	1006	652	653	272	605	82	289	38
3	Nemo Rd & Norris Peak Rd	SSSC	AM	10	0	27	0	0	0	0	37	10	8	31	0
			PM	17	0	7	0	0	0	0	37	13	28	62	0
			Daily	111	0	201	0	0	0	0	458	123	223	504	0
4	Longview Rd & Reservoir Rd	AWSC	AM	3	22	3	53	34	145	21	56	3	5	310	81
			PM	6	39	5	98	32	86	178	349	1	6	194	88
			Daily	47	328	52	764	453	1233	1318	2377	56	48	2546	756
5	Anderson Rd & Longview Rd	SSSC	AM	2	2	4	0	2	5	3	105	3	4	207	6
			PM	7	0	0	4	4	3	10	256	5	4	195	2
			Daily	68	19	47	12	17	70	64	2057	79	36	2154	28
6	161st Ave & Hwy 1416	SSSC	AM	0	0	0	1	0	88	67	13	0	0	21	25
			PM	0	0	0	19	0	70	179	25	0	0	22	9
			Daily	0	0	0	210	0	785	909	312	0	0	305	195
7	156th Ave & Hwy 1416	SSSC	AM	73	0	9	0	0	0	0	34	10	1	40	0
			PM	31	0	1	0	0	0	0	46	58	3	22	0
			Daily	366	0	50	0	0	0	0	448	370	40	413	0
8	Country Rd & Elk Vale Rd	SSSC	AM	12	25	43	7	122	5	3	28	40	58	25	3
			PM	48	93	81	6	52	1	11	48	38	77	43	16
			Daily	387	899	800	62	942	42	66	425	418	859	391	58

ID	Intersection	Control	Peak	Northbound			Southbound			Eastbound			Westbound		
				L	T	R	L	T	R	L	T	R	L	T	R
9	Sheridan Lake Rd & Hwy 385	SSSC	AM	0	179	27	22	268	0	0	0	0	39	0	15
			PM	0	203	36	19	215	0	0	0	0	40	0	25
			Daily	0	2325	465	246	2256	0	0	0	0	553	0	260
10	Universal Dr & Sturgis Rd	SSSC	AM	1	179	23	131	339	0	0	0	2	13	0	37
			PM	1	384	19	84	300	0	0	1	1	29	0	166
			Daily	12	3886	288	1239	3648	1	1	3	8	259	0	1361
11	Neck Yoke Rd & S Rockerville Rd	SSSC	AM	0	36	0	10	43	0	0	0	0	7	0	12
			PM	0	49	8	22	27	0	0	0	0	4	0	8
			Daily	0	465	47	151	469	0	0	0	0	55	0	180
12	Covington St & Twilight Dr	SSSC	AM	67	0	17	0	0	0	0	108	46	14	436	0
			PM	43	0	36	0	0	0	0	452	85	25	258	0
			Daily	667	0	344	0	0	0	0	3299	700	266	3571	0
13	Concourse Rd & Twilight Dr	SSSC	AM	9	0	0	75	0	26	66	106	7	0	333	129
			PM	3	4	0	315	4	39	111	401	10	1	218	66
			Daily	73	55	4	2370	51	443	1079	3005	66	6	2896	847
14	Old Folsom Rd & Lower Spring Creek Rd	SSSC	AM	0	0	0	3	0	3	0	24	0	0	46	16
			PM	0	0	0	15	0	0	3	40	0	0	22	6
			Daily	0	0	0	98	0	41	29	355	0	0	359	93
15	151st Ave & Hwy 1416	SSSC	AM	0	0	0	7	0	48	10	41	0	0	102	9
			PM	0	0	0	4	0	21	51	91	0	0	54	1
			Daily	0	0	0	58	0	322	300	574	0	0	578	36

TRAFFIC OPERATIONS

The purpose of the traffic operational analysis is to identify impacts associated with the 15 studied intersections. Identification of impacts and appropriate mitigation measures allows the agency to assess the existing and future roadway system’s safety, performance, maintenance, and capacity needs.

Methodology

Traffic operations are described in terms of level of service (LOS), based on the methodologies described in the Highway Capacity Manual (HCM), 7th Edition. Level of service (LOS) is a qualitative measure developed by the transportation profession to quantify traffic operations by incorporating traffic volumes, roadway geometry, and other parameters to estimate the delay per vehicle. LOS at intersections provide a means for identifying intersections that are experiencing operational difficulties, as well as providing a scale to compare intersections with each other. The scale is based on the ability of an intersection or street segment to accommodate the amount of traffic using it. The LOS scale ranges from “A” to “F”. LOS A indicates near free-flow traffic conditions with little delay and LOS F indicates breakdown of traffic flow with very high amounts of delay. At oversaturated intersections and approaches, the delay may only reflect the vehicles that can be processed in the analysis period and not the total delay for that intersection, thus underreporting the actual delay experienced by drivers. LOS C or better is generally desirable, and LOS D may be appropriate for urbanized areas in many agencies in South Dakota. Additionally, each approach to the intersection should be designed to have the highest LOS practical. The LOS thresholds for intersection delay are shown in **Table 9**.

Table 9 - Intersection Delay and Level of Service Thresholds

Level of Service	Average Delay (Seconds per Vehicle)		Description
	Unsignalized Intersection	Signalized Intersection	
A	≤ 10	≤ 10	Near free-flow traffic.
B	> 10 and ≤ 15	> 10 and ≤ 20	Minor delays.
C	> 15 and ≤ 25	> 20 and ≤ 35	Some delays, but not resulting in significant traffic congestion.
D	> 25 and ≤ 35	> 35 and ≤ 55	Delays with some traffic congestion.
E	> 35 and ≤ 50	> 55 and ≤ 80	Significant delays with significant traffic congestion, approaching capacity.
F	> 50	> 80	Breakdown of traffic flow, major traffic congestion.

For signalized intersections, the LOS is based on the average stopped delay per vehicle. The procedures used to evaluate signalized intersections use detailed information on geometry, lane use, signal timing, peak hour volumes, arrival types and other parameters. This information is then used to calculate delays and determine the capacity of each intersection.

Overall intersection LOS is undefined for side-street stop-controlled intersections within the HCM. The LOS for the side-street stop-controlled intersections in the analysis is based on the delay experienced by key movements within the intersection, rather than on the overall stopped delay per vehicle at the intersection. This difference from the method used for signalized intersections is necessary since the operating characteristics of side-street stop-controlled intersections are substantially different. Driver expectation and perceptions are entirely different.

For side-street stop-controlled intersections the through traffic on the major (uncontrolled) street experiences minimal to no significant delay at the intersection. Conversely, vehicles turning left and going across the major street from the minor street, or vehicles turning left from major street to minor street experience more delay than other movements and at times can experience significant delay. Vehicles on the minor street which are turning right from the minor street experience less delay than those turning left or going across from the same approach. Due to this situation, the LOS assigned to a side-street stop-controlled intersection is based on the average delay for vehicles turning left and going across the major street from the minor street approach and turning left from the major street to the minor street.

LOS for all-way stop controlled and or roundabout intersections are also based on delay experienced by the vehicles at the intersection. Since there is no major street, the highest delay could be experienced by any of the approaching streets.

Traffic operations were evaluated for the 15 study intersections using methodologies from the Highway Capacity Manual (HCM), 7th Edition within the PTV Vistro software package. Traffic operations were evaluated for the AM and PM peak conditions under existing 2023 and projected future 2045 traffic volumes. As noted previously, peak hour turning movement counts were collected by KLJ Engineering.

Existing 2023 Traffic Operations Results

The results of the existing (2023) traffic operations for the 15 study intersections are presented in **Table 10** on the next page.

Table 10 - Existing 2023 Traffic Operations Result

AWSC – All-way Stop Control; SSSC - Side Street Stop Control; NB – Northbound, SB - Southbound, EB – Eastbound, WB – Westbound, INT – Intersection. Refer to Figure 27 for the location of the Intersection by ID.

ID	Intersection	Control	Peak	Level of Service				
				NB	SB	EB	WB	INT
1	Sheridan Lake Rd & Dunsmore Rd	Signal	AM	C	C	B	B	B
			PM	C	C	B	B	B
2	Twilight Dr & Reservoir Rd	AWSC	AM	A	A	A	A	A
			PM	A	A	A	A	A
3	Nemo Rd & Norris Peak Rd	SSSC	AM	A	\	A	A	A
			PM	A	\	A	A	A
4	Longview Rd & Reservoir Rd	AWSC	AM	A	A	A	A	A
			PM	A	A	B	A	B
5	Anderson Rd & Longview Rd	SSSC	AM	A	A	A	A	A
			PM	B	A	A	A	B
6	161st Ave & Hwy 1416	SSSC	AM	\	A	A	A	A
			PM	\	A	A	A	A
7	156th Ave & Hwy 1416	SSSC	AM	A	\	A	A	A
			PM	A	\	A	A	A
8	Country Rd & Elk Vale Rd	SSSC	AM	A	A	A	B	B
			PM	A	A	B	B	B
9	Sheridan Lake Rd & Hwy 385	SSSC	AM	A	A	\	B	A
			PM	A	A	\	B	A
10	Universal Dr & Sturgis Rd	SSSC	AM	A	A	B	B	A
			PM	A	A	B	B	B
11	Neck Yoke Rd & S Rockerville Rd	SSSC	AM	A	A	\	A	A
			PM	A	A	\	A	A
12	Covington St & Twilight Dr	SSSC	AM	B	\	A	A	B
			PM	B	\	A	A	B
13	Concourse Rd & Twilight Dr	SSSC	AM	B	B	A	A	B
			PM	C	E	A	A	D
14	Old Folsom Rd & Lower Spring Creek Rd	SSSC	AM	\	A	A	A	A
			PM	\	A	A	A	A
15	151st Ave & Hwy 1416	SSSC	AM	\	A	A	A	A
			PM	\	A	A	A	A

Discussion of the Existing Traffic Operations Results

- The intersection of Concourse Rd with Twilight Dr experiences unacceptable delay and LOS in the PM peak hour under the existing 2023 intersection traffic volumes.
- All other intersections are operating with acceptable delay under the existing 2023 intersection traffic volumes.

Future 2045 Traffic Operations Results

Results of the projected (2045) traffic operations for the 15 study intersections are presented in **Table 11**.

Table 11 - Projected 2045 Study Intersection Level of Service (LOS)

AWSC – All-way Stop Control; SSSC - Side Street Stop Control; NB – Northbound, SB - Southbound, EB – Eastbound, WB – Westbound, INT – Intersection. Refer to Figure 27 for the location of the Intersection by ID.

ID	Intersection	Control	Peak	Level of Service				
				NB	SB	EB	WB	INT
1	Sheridan Lake Rd & Dunsmore Rd	Signal	AM	C	D	D	B	D
			PM	C	E	C	C	C
2	Twilight Dr & Reservoir Rd	AWSC	AM	A	A	A	A	A
			PM	A	A	A	A	A
3	Nemo Rd & Norris Peak Rd	SSSC	AM	A	\	A	A	A
			PM	A	\	A	A	A
4	Longview Rd & Reservoir Rd	AWSC	AM	A	A	A	B	B
			PM	B	B	D	B	C
5	Anderson Rd & Longview Rd	SSSC	AM	B	A	A	A	A
			PM	B	B	A	A	B
6	161st Ave & Hwy 1416	SSSC	AM	\	A	A	A	A
			PM	\	A	A	A	A
7	156th Ave & Hwy 1416	SSSC	AM	A	\	A	A	A
			PM	A	\	A	A	A
8	Country Rd & Elk Vale Rd	SSSC	AM	A	A	B	B	B
			PM	A	A	B	B	B
9	Sheridan Lake Rd & Hwy 385	SSSC	AM	A	A	\	B	B
			PM	A	A	\	B	B
10	Universal Dr & Sturgis Rd	SSSC	AM	A	A	B	B	A
			PM	A	A	B	C	B
11	Neck Yoke Rd & S Rockerville Rd	SSSC	AM	A	A	\	A	A
			PM	A	A	\	A	A
12	Covington St & Twilight Dr	SSSC	AM	B	\	A	A	B
			PM	C	\	A	A	B
13	Concourse Rd & Twilight Dr	SSSC	AM	C	C	A	A	B
			PM	C	F	A	A	F
14	Old Folsom Rd & Lower Spring Creek Rd	SSSC	AM	\	A	A	A	A
			PM	\	A	A	A	A
15	151st Ave & Hwy 1416	SSSC	AM	\	A	A	A	A
			PM	\	A	A	A	A

AWSC – All-way Stop Control; SSSC – Side Street Stop Control; NB – Northbound, SB – Southbound, EB – Eastbound, WB – Westbound

Discussion of the Existing Traffic Operations Results

- The overall intersection of Sheridan Lake with Dunsmore Rd and its southbound and eastbound approach is expected to operate with unacceptable delay and LOS D during the AM and PM peak hours under the projected future 2045 intersection traffic volumes. The southbound approach of the intersection is also expected to operate with unacceptable delay and LOS E in the PM peak under the projected 2045 intersection traffic volumes. However, the overall intersection is expected to operate with acceptable delay and LOS C in the PM Peak under the projected future 2045 intersection traffic volumes.
- The intersection of Concourse Rd with Twilight Dr is expected to continue to deteriorate through 2045 and experiences unacceptable delay and LOS in the PM peak hour under the projected future 2045 intersection traffic volumes.
- The eastbound approach of the intersection of Longview Rd with Reservoir Rd is expected to operate with unacceptable delay and LOS D in the PM peak hour under the projected future 2045 intersection traffic volumes.
- All other intersections are expected to operate with acceptable delay and LOS under the projected future 2045 intersection traffic volumes.

CRASH AND SAFETY ANALYSIS

An examination of transportation safety is an essential component of the transportation planning process. Improving transportation safety requires more than just fixing a road or increasing police enforcement. To be most effective, safety improvements need to consider the “four Es” of transportation safety: Education, Enforcement, Engineering, and Emergency Services. The objective of the safety analysis is to improve the safety of all users of the transportation system and work towards achieving the mission of the South Dakota Strategic Highway Safety Plan (SHSP): save lives and reduce serious injuries.

The South Dakota Department of Public Safety (SDDPS) manages crash records in South Dakota. The law enforcement departments of the respective agencies around the state are responsible for reporting crashes to the SDDPS. Five years of crash records from January 1, 2018, through December 31, 2022, were provided by the SDDPS to aid in the analysis of traffic crash trends within the study area. During the five-year analysis period, 12,268 crashes were reported in Pennington County, of which 1,112 crashes were reported along County Roads. The summary of crashes along roadways, listed by jurisdiction, are shown in **Table 12**.

Table 12 - Crashes by Roadway Jurisdiction (Year 2018 to 2022)

Year	Crashes by Roadway Jurisdiction				All Roads
	County	State	City	Others	
2018	230	982	1,241	73	2,526
2019	201	1,013	1,293	77	2,584
2020	229	1,050	954	23	2,256
2021	238	1,137	1,141	12	2,528
2022	214	1,058	1,082	20	2,374
TOTAL	1,112	5,240	5,711	205	12,268

The high-level crash trends on County Roads from this data are discussed below, with more detailed information provided later in the section.

- There were 1,112 crashes reported during the five-year analysis period.
- There were 12 crashes that resulted in a fatality and 72 crashes that resulted in an incapacitating injury.
- There were seven crashes that involved a pedestrian, and two crashes that involved a bicyclist.
- About 6.6-percent of crashes occurred within cities in Pennington County.
- About 18-percent of crashes were intersection related.

Crash Severity

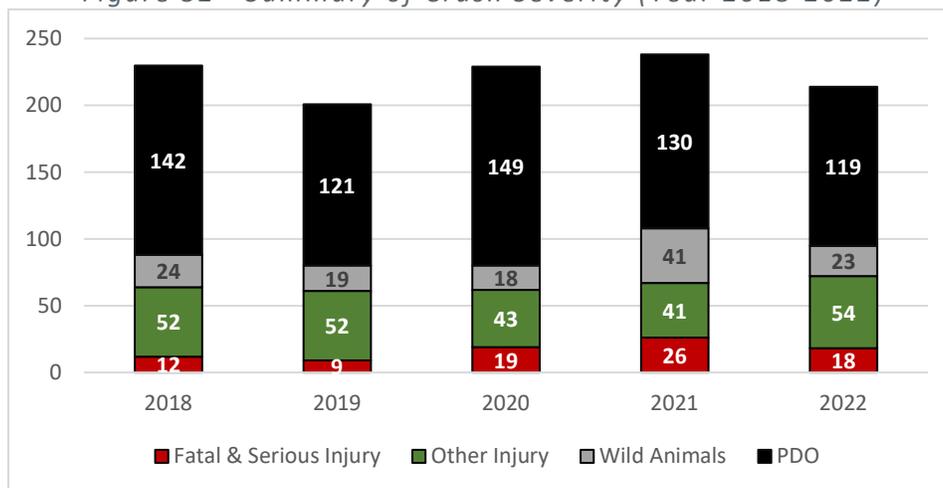
Consideration of crash severity is important for understanding the current safety conditions of the system and developing recommendations to address specific problem areas. The SDDOT crash data categorized reported crashes by the following severity levels:

- Fatal
- Incapacitating Injury
- Non-Incapacitating Injury
- Minor Injury
- Property Damage Only (PDO)

Crash severity is categorized based on the most severe injury of the crash. For example, if a crash involved two vehicles that resulted in one serious injury and two possible injury crashes, the crash is reported as a suspected serious injury crash. A suspected serious injury crash is defined as an injury, other than fatal which prevents the injured individual from walking, driving, or normally continuing the activities they could perform before the injury.

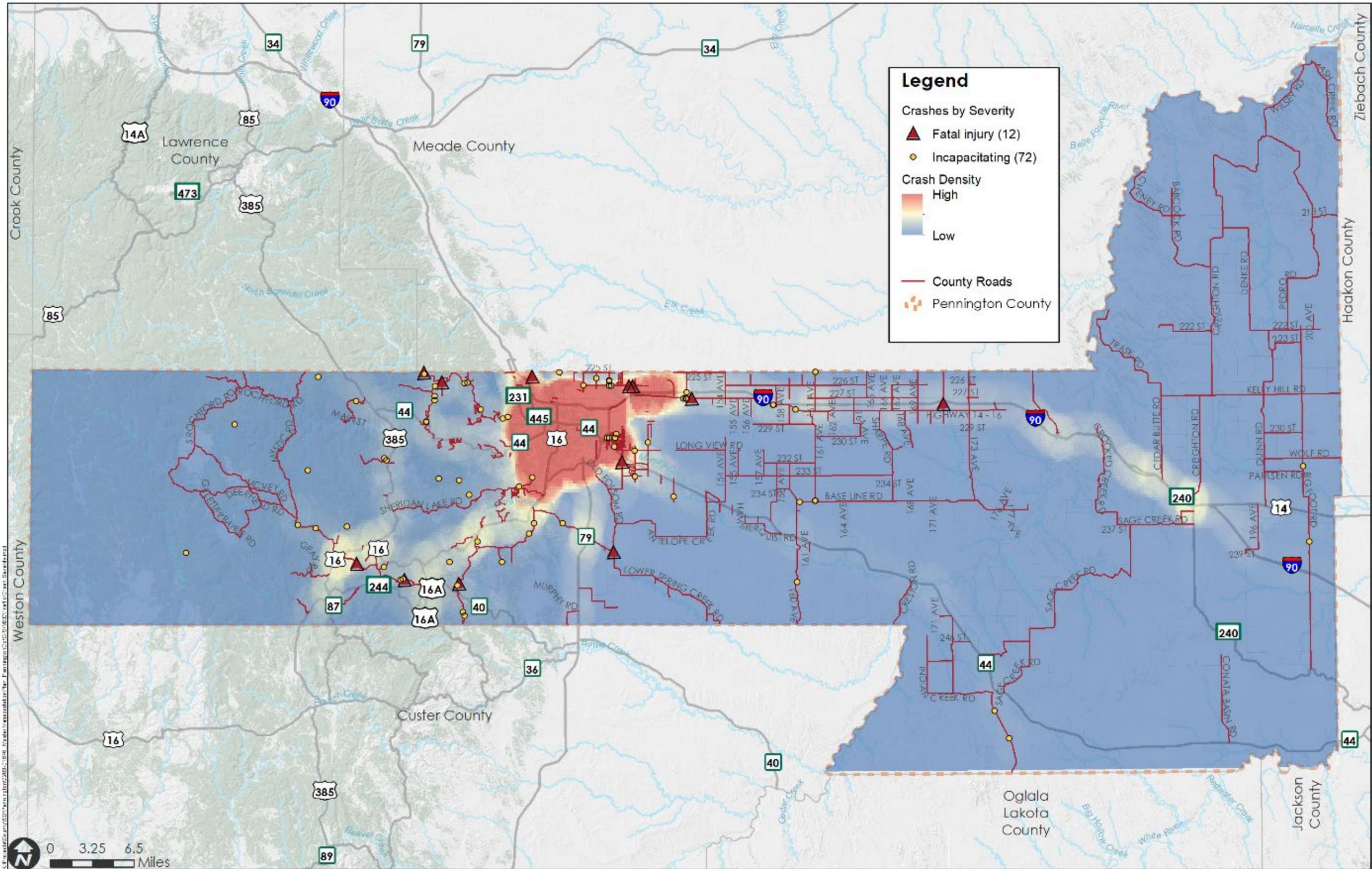
There were 12 crashes reported that resulted in death, 314 crashes that resulted in an injury (72 incapacitating, 137 non-incapacitating, and 105 possible injury), 661 PDO crashes, and 125 crashes that involved a collision with animals. **Figure 32** shows that crashes resulting in fatality or incapacitating injury have increased from 2019 to 2022. The number of PDO crashes have declined after 2020.

Figure 32 - Summary of Crash Severity (Year 2018-2022)



The crash data included spatial records which were analyzed to understand patterns of motorized vehicular crashes and identify high-risk areas. This was done through a hot-spot analysis which identifies clusters of dense accident occurrence, as shown in **Figure 33** and **Figure 34**.

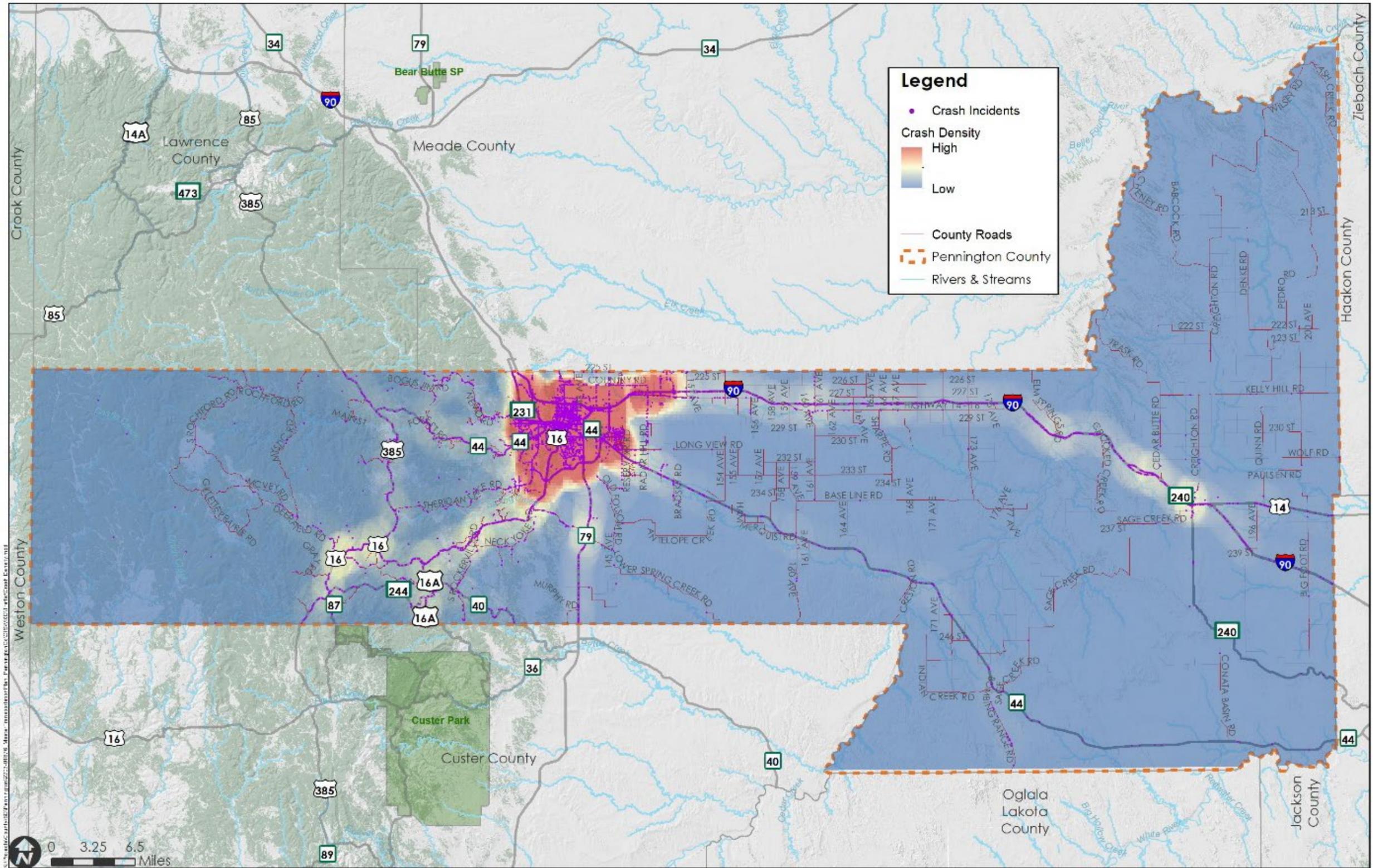
Figure 33 - Crash Severity (Year 2018-2022)



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

July 2023

Figure 34 - Relative Crash Density within the Study Area (Year 2018-2022)



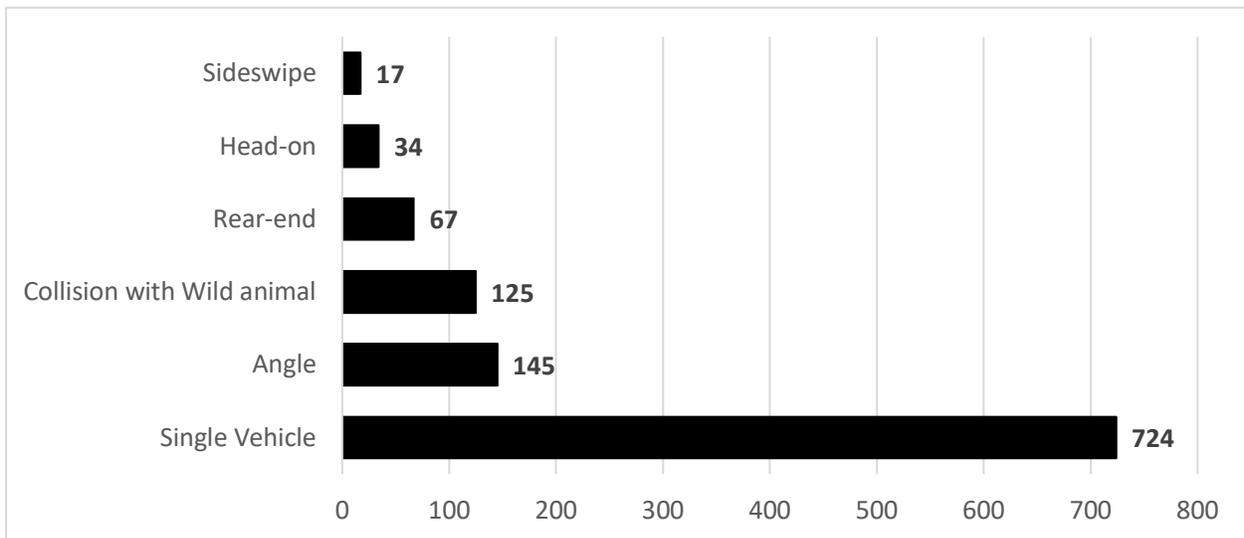
Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

July 2023

Crash by Collision Type

Analyzing crash type aids in understanding the conditions that contribute to crashes and supports development of countermeasures to mitigate or minimize these conditions. During the analysis period, single vehicle related (724), angle (145), collision with wild animal (125), and rear-end (67) crashes were the most predominant crash types along the County roads. **Figure 35** shows crashes by crash type during the five-year analysis period.

Figure 35 - Crashes by Manner of Collision (Year 2018-2022)



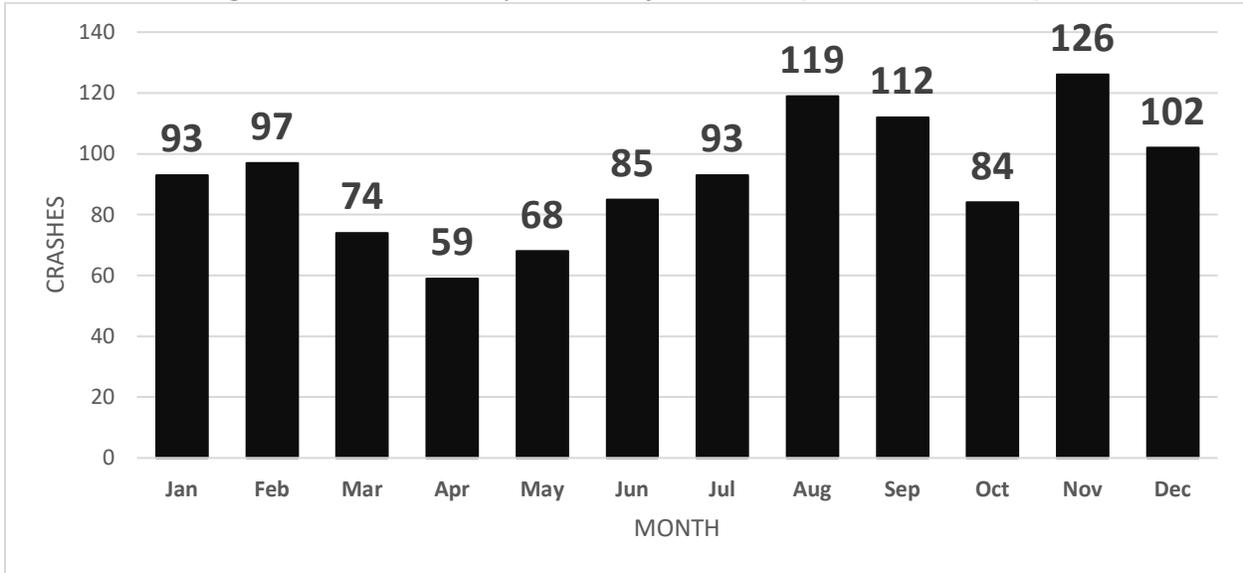
Crash Occurrence Period

Crash occurrence statistics assist in refining patrol deployment decisions. Typically, traffic varies significantly by time of day and day of the week, particularly during weekday peak hours. Crash data for the study area was evaluated based on the period of occurrence on the crash with respect to the month of the year and the day of the week.

Month of the Year

Crashes by the month of the year during the analysis period is shown in **Figure 36**. The highest number of vehicular crashes occurred in the months of August and November over the analysis period. The Sturgis Motorcycle Rally, consistently bringing nearly half a million visitors to the County, would logically increase crashes during the month of August. There were 418 crashes reported between November and February which corresponds to 38-percent of all crashes. Challenging winter road conditions including snow, sleet, and ice can contribute to a higher number of crashes during the winter months. The number of crashes is generally low in the spring compared to the rest of the year.

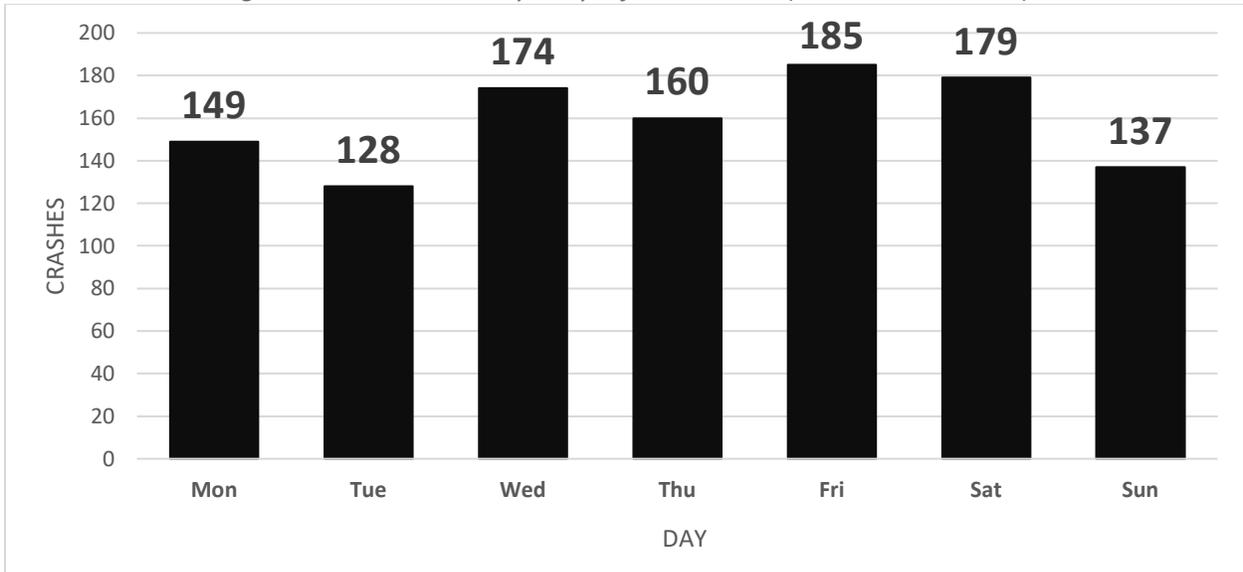
Figure 36 - Crashes by Month of the Year (Year 2018-2022)



Day of the Week

Crashes by the day of the week is shown in **Figure 37**. The fewest crashes occur on Tuesdays, and the most on Fridays.

Figure 37 - Crashes by Day of the Week (Year 2018-2022)



Crashes Involving Impaired Drivers

From 2018 to 2022, there were 147 crashes involving impaired drivers. This corresponds to 13- percent of all crashes in Pennington County. The statewide average crashes involving impaired drivers during the same time frame was 5.5 percent. Five of the 12 fatal crashes (42-percent of all fatal crashes) and 24 of the 72 incapacitating crashes (33-percent of all incapacitating crashes) were alcohol related in Pennington

County over the analysis period. The statewide average fatal crashes involving impaired drivers during the same time frame was 43 percent.

Crashes involving Wild Animals

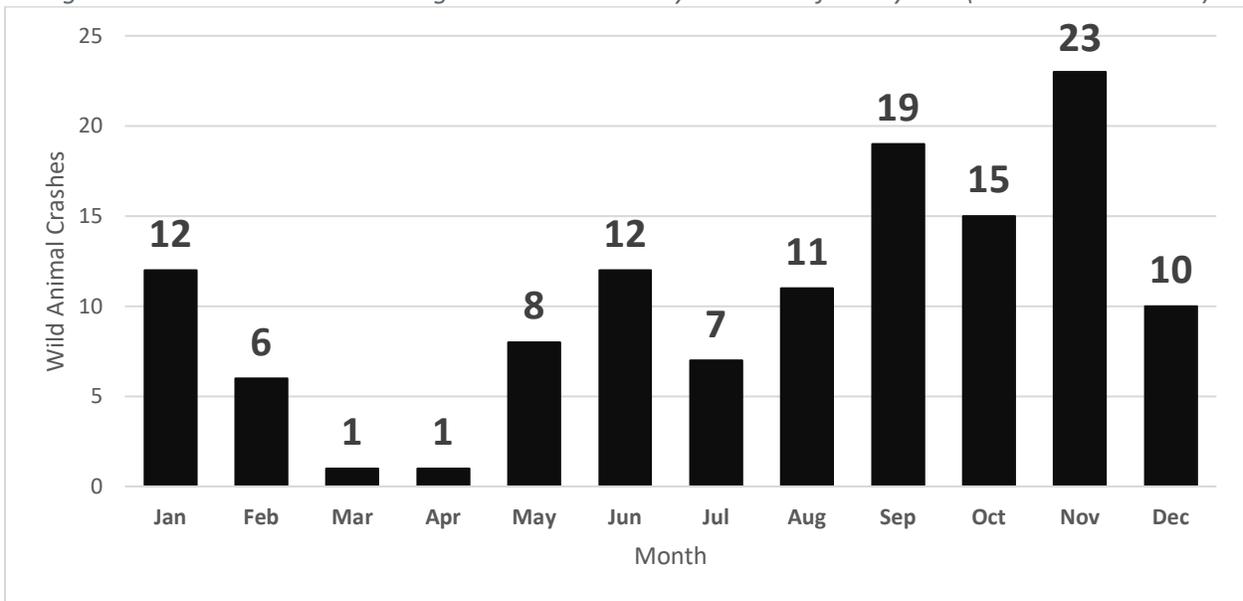
From 2018 to 2022, there were 125 crashes that involved wild animals which corresponds to an average of 25 crashes per year. This is likely understated as many animal-vehicle collisions go unreported if the crash does not involve property damage or injury. South Dakota is the fourth-ranked state in the Nation for insurance claims from a collision with an animal (**Table 13**).

Table 13 - Top Five States for Claims from a Collision with an Animal (2020)

Rank	1	2	3	4	5
State	West Virginia	Montana	Pennsylvania	South Dakota	Michigan

Pennington County sees the highest number of wild animal-related crashes in November (**Figure 38**), which is in line with the deer breeding season that runs from October and into December (peaking in mid-November). Of the animal-vehicle collisions within the study area, the majority occurred along Sheridan Lake Rd (21 crashes) and Nemo Rd (18 crashes). Wild animal crash locations are shown in **Figure 39**.

Figure 38 - Crashes involving Wild Animals by month of the year (Year 2018-2022)

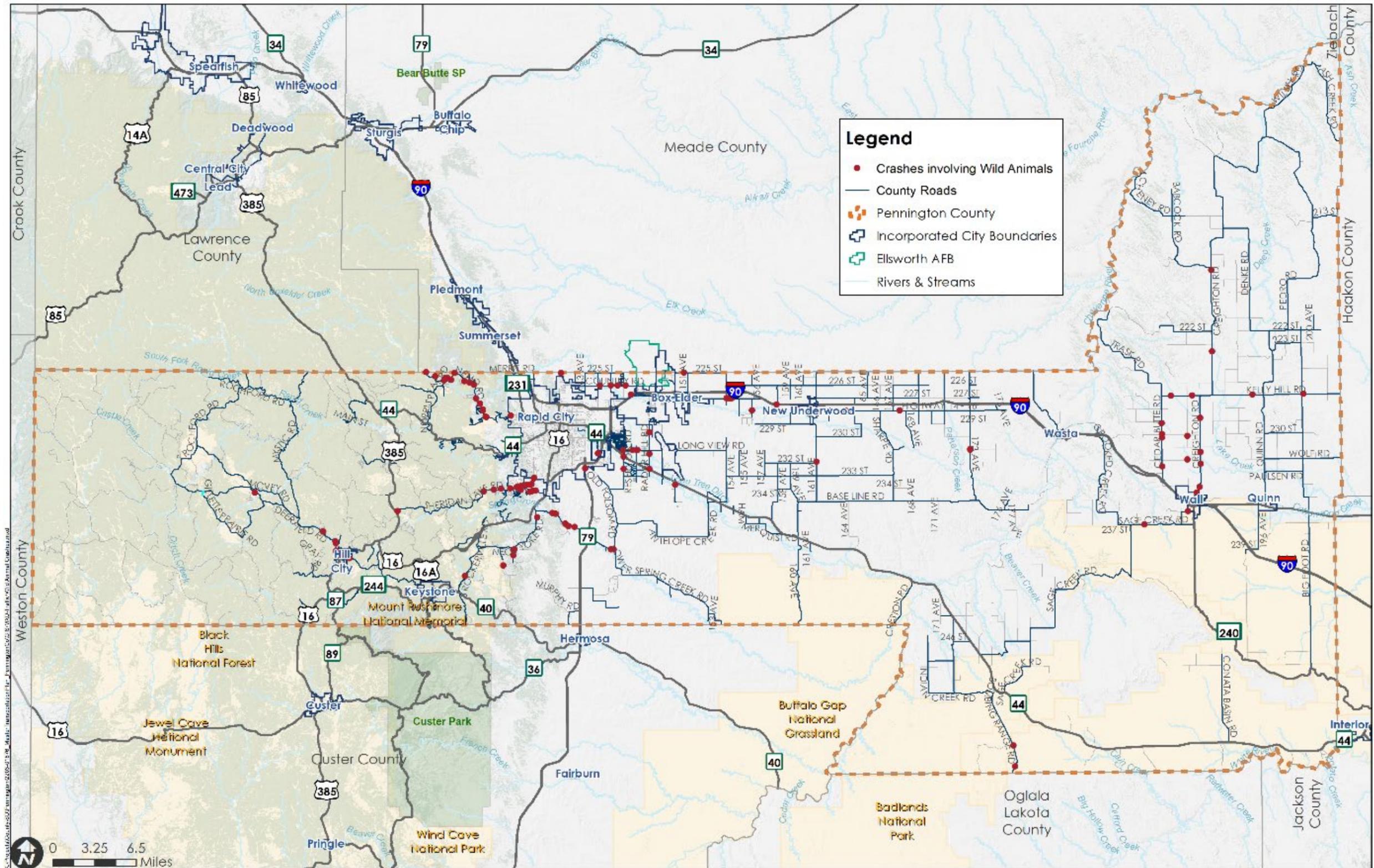


Crashes involving Non-motorists

From 2018 to 2022, there were seven crashes that involved pedestrians, and two crashes that involved bicyclists. Pedestrian crashes included one incapacitating injury, five non-incapacitating, and one possible injury type crash. Bicyclist crashes included one incapacitating and one possible injury type crashes. The crashes involving pedestrians and bicyclists (non-motorized crashes) are shown in **Figure 40**.

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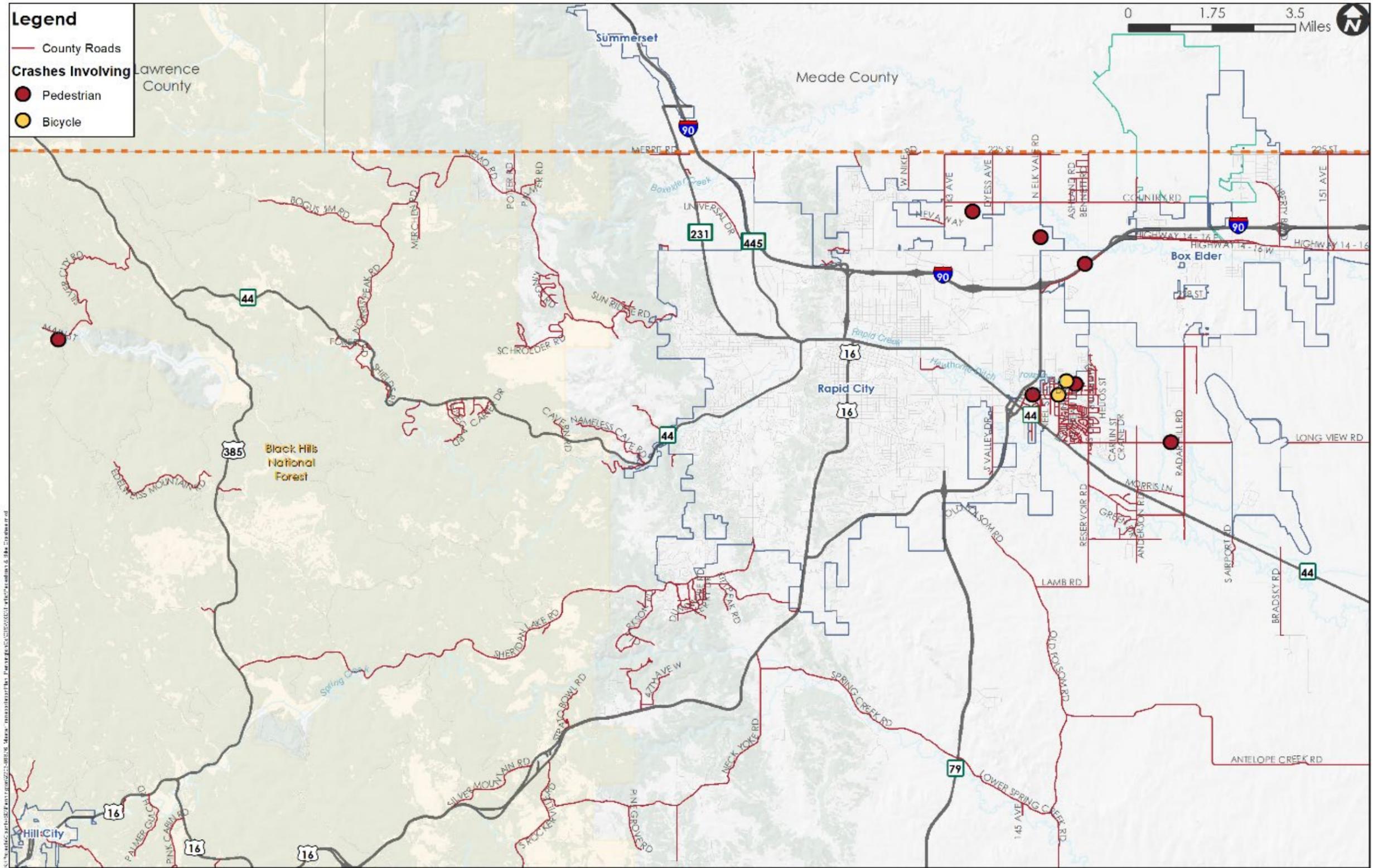
Figure 39 - Location of Crashes Involving Wild Animals (Year 2018-2022)



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

June 2023

Figure 40 - Crashes Involving Pedestrians and Bicyclists (Year 2018-2022)



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

July 2023

High Frequency Crash Intersections

To assess the safety performance of intersections within the study area, eleven intersections were identified with the highest number of crashes during the analysis period. **Table 14** summarizes the number of crashes for each high-crash intersection, with **Figure 41** showing the location of the intersections. The intersection of Highway 1416 with Radar Hill Road experienced the highest number of crashes (53), followed by the intersection of Highway 44 with Twilight Drive (31). Three intersections each along Highway 1416, Twilight Drive, and two intersections along Highway 44 were among the top highest crash intersections in the County.

Table 14 – Top 11 Highest Frequency Crash Intersections (Year 2018-2022)

ID	Intersection	Study Intersection: Yes (or) No	Crashes	Crash Severity Type				
				K	A	B	C	PDO
1	Hwy 1416 & Radar Hill Rd	No	53	-	3	9	11	30
2	Hwy 44 & Twilight Dr	No	31	-	1	4	12	14
3	I-90 Service Rd S & US Hwy 16	No	25	-	1	5	2	17
4	Twilight Dr & Degeest Dr	No	17	-	1	-	1	15
5	Hwy 1416 & West Gate Rd	No	15	-	1	3	1	10
6	Hwy 1416 & Commercial Gate Rd	No	14	-	-	-	5	9
7	Liberty Blvd & Tower Rd	No	14	-	-	6	1	7
8	Country Rd & Elk Vale Rd	Yes	13	-	2	3	1	7
9	Hwy 79 and Lower Spring Creek Rd	No	12	2	2	1	1	6
10	Hwy 44 and Jolly Ln	No	12	-	-	2	3	7
11	Twilight Dr & Plateau Ln	No	11	-	-	2	1	8

K – Fatal, A – Incapacitating Injury, B – Non-incapacitating Injury, C – Possible Injury, PDO – Property Damage Only

The crash trends, safety challenges, and potential alternatives to mitigate the safety challenges for the top eleven intersections are discussed in detail as follows:

1. Hwy 1416 & Radar Hill Rd

There were 53 crashes (three incapacitating, none non-incapacitating, 11 possible injury, and 30 non-injury crashes) reported at the intersection during the analysis period. Angle crashes (40) were the most prominent type of crashes at the intersection. The intersection of Highway 1416 with Radar Hill Road is a wide, median divided intersection where the eastbound and westbound approaches of Highway 1416 operate as independent intersections with Radar Hill Road due to the large median (approximately 120 feet) between them.

The intersection was converted to an all-way stop-control (AWSC) intersection in 2020. Prior to that, the intersection operated as a side-street stop-controlled intersection with stops on the northbound and southbound approaches. The major contributing factor to the angle crashes was failure to yield.

The number of crashes involving eastbound- and northbound-traveling vehicles, and eastbound- and southbound-traveling vehicles were equal. The rate of angle crashes reduced between 2020 and 2022 while operating as an AWSC intersection. The major contributing factor to the angle crashes was failure to yield. The intersection operates as a side-street stop-controlled intersection with stops on the

northbound and southbound approaches. Most of the angle crashes involved vehicles traveling northbound and westbound. The intersection is currently being reviewed as part of the Highway 1416 and Radar Hill Road Traffic and Corridor Analysis Study, being completed concurrently with this MTP.

2. Highway 44 and Twilight Drive

There were 31 crashes (one incapacitating, four non-incapacitating, 12 possible injury, and 14 non-injury type) reported during the analysis period. Among these, angle crashes (22) were the predominant type, followed by rear-end crashes (seven). The intersection is regulated by a traffic signal employing protected/permissive left-turn phasing. Most angle crashes involved vehicles making a left-turn from the eastbound or westbound directions and colliding with oncoming through traffic. The primary contributing factor for these incidents were failure to yield. To address these safety concerns, potential alternatives include either one or combination of:

- Implementing advanced warning signs with flashing beacon heads to alert drivers to an impending left-turn movement, facilitating better preparation for the turn.
- Adjusting signal timings to minimize delays, particularly during peak traffic hours.
- Optimizing signal phases and timings to enhance overall traffic flow.

3. I-90 Service Rd S & US Hwy 16

There were 25 crashes (one incapacitating, five non-incapacitating, two possible injury, and 17 non-injury type) reported during the analysis period. Among these, angle crashes (19) were the predominant type. The intersection is controlled by side-street stops on I-90 Service Rd approaches. Most angle crashes involved collisions between motorists traveling in the southbound and westbound directions. The primary contributing factor for these incidents were failure to yield. To address these safety concerns, potential alternatives include either one or combination of:

- Monitoring the traffic volumes to determine whether the intersection would warrant a signal or a roundabout. If so, an upgrade to the existing traffic control may be required.
- Increasing enforcement of traffic laws, especially focusing on violations related to failure to yield.

4. Twilight Dr & Degeest Dr

There were 17 crashes (one incapacitating, one possible injury, and 15 non-injury type) reported during the analysis period. Among these, angle crashes (13) were the predominant type. The intersection is controlled by side-street stops on the Degeest Dr approach. Most angle crashes involved collisions between motorists traveling in the southbound and westbound directions. The primary contributing factor for these incidents were speeding. To address these safety concerns, potential alternatives include either one or combination of:

- Implementing traffic calming measures, such as speed bumps or raised intersections to discourage speeding and encourage compliance with speed limits.
- Installing speed feedback signs as a visual reminder for motorists to adjust their speeds.
- Increased enforcement of the posted speed limit.

5. Hwy 1416 & West Gate Rd

There were 15 crashes (one incapacitating, three non-incapacitating, one possible injury, and 10 non-injury type) reported during the analysis period. Among these, rear-end crashes (eight) were the

predominant type, followed by single vehicle (four) and angle (three) type. The intersection of Highway 1416 with West Gate Rd is a divided intersection where the eastbound and westbound approaches of Highway 1416 operate as independent intersections with West Gate Rd due to the large median (approximately 160 feet) between them. Both the intersections are controlled by all-way stops. Most of the rear-end crashes involved motorists travelling in the westbound direction.

The intersection is currently being redesigned as part of improvements to the I-90 Exit 63 Interchange.

6. Hwy 1416 & Commercial Gate Rd

There were 14 crashes (five possible injury, and nine non-injury type) reported during the analysis period. Among these, angle crashes (10) were the predominant type. The intersection of Highway 1416 with Commercial Gate Rd is a divided intersection where the eastbound and westbound approaches of Highway 1416 operate as independent intersections with Commercial Gate Rd due to the large median (approximately 110 feet) between them. All the angle crashes involved at least one vehicle travelling in the westbound direction. The intersection of westbound Highway 1416 with the Commercial Gate Rd is controlled by side street stop on westbound Highway 1416 approach. The major contributing factors to the angle crashes were failure to yield.

The intersection is currently being reviewed as part of the Highway 1416 and Radar Hill Road Traffic and Corridor Analysis Study.

7. Liberty Blvd and Tower Rd

There were 14 crashes (six non-incapacitating, one possible injury, and seven non-injury type) reported during the analysis period. Among these, angle crashes (10) were the predominant type. All the angle crashes involved at least one vehicle traveling along the westbound direction. The intersection is controlled by a traffic signal. The intersection is obscured by the roadway curvature for the motorists traveling in the westbound direction. The sudden transition from a seemingly clear and open road to the abrupt visibility of the traffic signal may catch motorists off guard leading to abrupt braking or running red lights. To address these safety concerns, potential alternatives include either one or combination of:

- Installation of advanced warning systems such as flashing lights.
- Installation of enhanced warning signage such as prominent signage ahead of the curve.
- Use of larger signal heads to improve visibility of the signal.
- Adjustment of the timing of the traffic signal to allow for a more gradual transition between green, yellow, and red phases.
- Enhancement of the lighting at the intersection, especially around the curve, to improve visibility during low light conditions.
- Adjustments to the road design to improve visibility.

8. Country Rd and Elk Vale Rd

There were 13 crashes (two incapacitating, three non-incapacitating, one possible injury, and seven non-injury type) reported during the analysis period. Among these, angle crashes (eight) were the predominant type. This includes two incapacitating crashes that occurred during dark conditions under no intersection lighting. The primary contributing factors for these incidents were failure to yield and disregarding the traffic control. The potential alternatives to address the safety concerns have been discussed under

Extensive Traffic Operations and Safety Evaluation, **Location # 8: Country Road and Elk Vale Road** section of the plan.

9. Highway 79 and Lower Spring Creek Rd

There were 12 crashes (Two fatal, two incapacitating, one non-incapacitating, one possible injury, and six non-injury type) reported during the analysis period. Among these, angle crashes (10) were the predominant type. All the fatal and injury crashes were angle crashes. Most (7/10) angle crashes involved collisions between motorists traveling in the southbound and eastbound directions. Highway 79 is a high-speed undivided multi-lane roadway with a posted speed limit of 70-mph. All the angle crashes were during daylight conditions. The primary contributing factor for these incidents were failure to yield. To address these safety concerns, potential alternatives include either one or combination of:

- Explore innovative engineering solutions, such as the installation of Intersection Conflict Warning Systems (ICWS) that use technology to alert drivers of potential conflicts at intersections.
- Conduct a speed limit review on Highway 79 to determine if adjustments are warranted based on current traffic conditions and crash data.
- Placement of rumble strips in advance of the intersection on the eastbound approach.

10. Highway 44 and Jolly Ln

There were 12 crashes (two non-incapacitating, three possible injury, and seven non-injury type) reported during the analysis period. This includes five rear-ends, and four angle crashes. The intersection is controlled by a traffic signal. The intersection has skewed approaches. To address these safety concerns, potential alternatives include either one or a combination of:

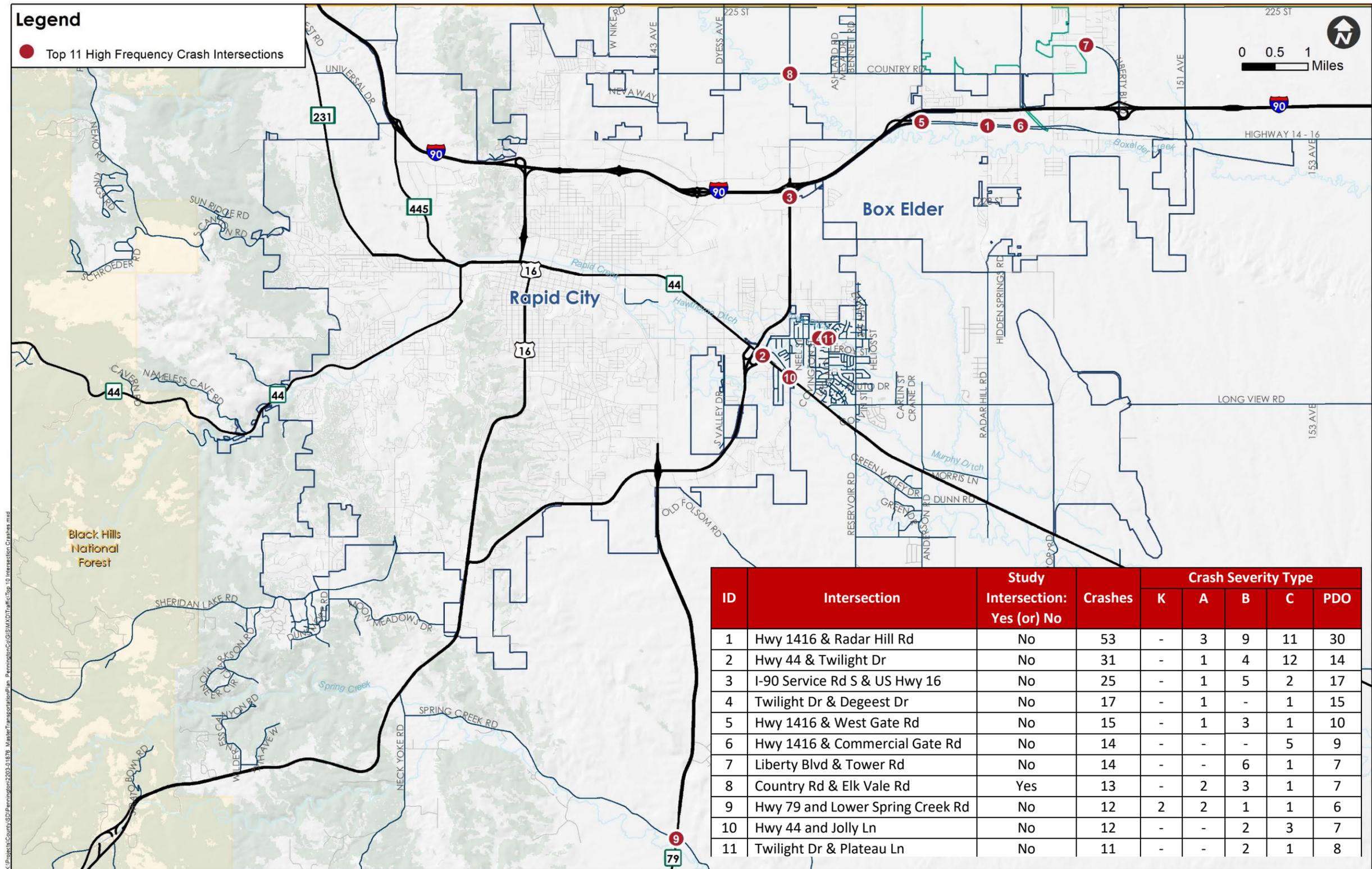
- Adjust the alignment of the intersection to reduce skewed approaches and improve visibility.
- Increase the turn radii to accommodate larger turning vehicles and reduce the likelihood of angle crashes.

11. Twilight Dr and Plateau Ln

There were 11 crashes (two non-incapacitating, one possible injury, and eight non-injury type) reported during the analysis period. This includes eight angle crashes. The intersection is controlled by stop control with stops on Plateau Ln approaches. The major contributing factors to the angle crashes were failure to yield and speeding. The land use around the intersection is single-home residential. To address these safety concerns, potential alternatives include either one or combination of:

- Monitoring the traffic volumes to analyze if the intersection meets warrant for all-way stops. All-way stops can improve traffic control and reduce the likelihood of angle crashes.
- Enforce traffic laws through increased police presence and monitoring, particularly focusing on failure to yield and speeding.
- Encourage community involvement in monitoring and reporting unsafe driving behaviors.

Figure 41 - Top 11 High Frequency Crash Intersections (Year 2018-2022)



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

February 2024

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EXTENSIVE TRAFFIC OPERATIONS AND SAFETY EVALUATION

Site visits were conducted in July 2023 for each of the fifteen study intersections chosen by Pennington County for detailed analysis. Site visits enabled evaluators to identify operational issues, such as traffic flow disruptions, signal timing problems, or issues related to pedestrian and cyclist access. Additionally, evaluators can identify potential safety hazards, such as visibility issues, inadequate lighting, or confusing traffic signal operations, which may not be apparent from reports or statistical data alone. This firsthand knowledge is crucial for developing effective strategies to address operational and safety challenges. The visits were necessary to assess existing issues and establish a baseline for evaluating future conditions. A summary of observations for each intersection is provided in the following section.

Location # 1: Sheridan Lake Road and Dunsmore Road

The Sheridan Lake Road and Dunsmore Road intersection is located southwest of Rapid City. The following photo was taken during the site visit.

Figure 42 - Study Intersection 1: Sheridan Lake Rd and Dunsmore Rd



The overall intersection of Sheridan Lake with Dunsmore Rd and its southbound and eastbound approach is expected to operate with unacceptable delay and LOS D during the AM and PM peak hours under the projected future 2045 intersection traffic volumes. The southbound approach of the intersection is also expected to operate with unacceptable delay and LOS E in the PM peak under the projected 2045 intersection traffic volumes. However, the overall intersection is expected to operate with acceptable delay and LOS C in the PM Peak under the projected future 2045 intersection traffic volumes. The intersection operations are expected to continue to deteriorate if no improvements are made. The unacceptable delays are generally experienced along the southbound approach of Dunsmore Rd. The intersection is on the top of a vertical sag along Dunsmore Rd and is controlled by a traffic signal.

There were 10 crashes (one incapacitating, one non-incapacitating, three possible injury, and two non-injury crashes) reported during the five-year analysis period from 2018 to 2022. Among these, angle crashes (seven) were the predominant type. The primary contributing factor for the crashes were failure to yield to vehicles and running red lights.

Left turn lanes are present on the Sheridan Lake Road approaches and the southbound approach for Dunsmore Rd. The existing 2023 and projected 2045 northbound (Dunsmore Rd) left turn volumes (200+

in 2023 and 300+ in 2045) are generally high during the AM peak hour. There are also no turn phases operating at the intersection and there are no pedestrian crossing facilities.

To address the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Adjust the signal timings to prioritize the southbound approach during the peak hours.
- Introduce dedicated turn phases for left turns, especially for the southbound approach off Dunsmore during peak hours.
- Implement a system for continuous monitoring of traffic conditions and intersection performance.

Location # 2: Twilight Drive and Reservoir Road

The Twilight Drive and Reservoir Road intersection is in Rapid Valley. The following photo was taken during the site visit.

Figure 43 - Study Intersection 2: Twilight Dr and Reservoir Rd



The intersection of Twilight Dr with Reservoir Rd is controlled by all-way stops. The intersection has left turn lanes on all four approaches. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. There were four crashes reported for the intersection during the five-year analysis period from 2018 to 2022. This includes two possible injury and two non-injury crashes. There were three angle crashes (two possible injury and one non-injury crash) and one rear-end (non-injury crash). One of the angle crashes occurred during dark conditions with no lighting.

The intersection has no lighting and is on a downhill grade north to south through the intersection. There are pedestrian ramps and sidewalk connections on all four quadrants of the intersection. The crosswalks are faded. There is a retaining wall in the northeast quadrant of the intersection which limits visibility.

To address the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Adding intersection lighting would be beneficial. It will improve visibility during dark conditions and address the downhill grade to enhance visibility.
- Repaint the crosswalks with high-visibility markings to enhance visibility.

- There were no crashes involving pedestrians or bicyclists during the analysis period. Consider installing additional pedestrian signage and crossing beacons, especially if there is a concern about pedestrian safety.
- Consider implementation of traffic calming measures, such as speed bumps or raised crosswalks, to encourage drivers to adhere to speed limits and enhance overall safety.

Location # 3: Nemo Road and Norris Peak Road

The Nemo Road and Norris Peak Road intersection is about six miles east of I-90 and northwest of Rapid City. The following photo was taken during the site visit.

Figure 44 - Study Intersection 3: Nemo Road and Norris Peak Road



The intersection of Nemo Rd with Norris Peak Rd is controlled by yield signs with yield sign on Norris Peak Rd approach. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. There were three (3) crashes (one non-incapacitating, one possible injury, and non-injury crash) reported during the analysis period from 2018 and 2022. This includes one angle, one rear-end, and one single vehicle related crashes. The Nemo Road and Norris Peak Road intersection is a skewed T-intersection with Norris Peak Road entering Nemo Road at the end of a horizontal curve. Nemo Road has a posted speed limit of 50 mph. There are no turn lanes or lighting at the intersection.

To address the traffic operations and safety concerns, potential alternatives include either one or combination of:

- The yield sign may be replaced with a stop sign.
- Additional signage to indicate the presence of a skewed intersection and the need for caution is recommended.
- Reduction of the posted speed limit on Nemo Rd approaching the intersection to enhance safety, especially given the curved nature of the road may be beneficial.
- Redesigning the intersection to reduce or eliminate the skew and improve sightlines should be considered. A possible solution would be to bend Norris Peak Road into a 90-degree intersection with Nemo Road, and adding a left turn lane on Nemo Road for turns onto Norris Peak Road.
- Chevron signs could also be installed to highlight the curvature of Nemo Road.

Location # 4: Longview Road and Reservoir Road

The Longview Road and Reservoir Road intersection is in Rapid Valley. The following photo was taken during the site visit.

Figure 45 - Study Intersection 4: Longview Road and Reservoir Road



The intersection of Longview Rd with Reservoir Rd is controlled by all-way stops. There was twice as much traffic on Longview Rd as there was on Reservoir Rd. The intersection and its approaches operate with acceptable delay and LOS during the AM and PM peak hours under the existing 2023 intersection traffic volumes. The eastbound approach of the intersection is expected to operate with unacceptable delay and LOS during the PM peak under projected 2045 traffic volumes. There were three crashes reported during the five-year analysis period from 2018 to 2022. Two of the three crashes occurred during dark conditions under no intersection lighting.

There are left turn lanes on all approaches and a southbound right turn lane, and no intersection lighting. There is a hill crest a short distance west of the intersection, but visibility appears adequate on all intersection approaches.

To address the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Adding intersection lighting would be beneficial. It will improve visibility during dark conditions.
- Replace the all-way stop control of the intersection with side-street stop control as the intersection does not meet the all-way stop control warrants under the existing 2023 and projected 2045 traffic volumes. Recommend keeping stop signs on the Reservoir Rd approaches. This will improve traffic operations.

Location # 5: Anderson Road and Longview Road

The Anderson Road and Longview Road intersection is located in Rapid Valley. The following photo was taken during the site visit.

Figure 46 - Study Intersection 5: Anderson Road and Longview Road



The intersection of Anderson Rd with Longview Rd is controlled by side street stops with stops on Anderson Rd approaches. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. There were three crashes reported during the five-year analysis period from 2018 to 2022. Two of the three crashes involved collisions with wild animals.

The intersection has no turn lanes or lighting. All approaches are straight and level. The northwest and southwest quadrants of the intersection have limited visibility due to tree growth. Pruning is recommended.

To improve the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Pruning trees at the intersections will help maintain clear sightlines for drivers. Unobstructed visibility is crucial for drivers to see oncoming traffic, pedestrians, and traffic signals, reducing the risk of crashes.
- Adding intersection lighting would be beneficial. It will improve visibility during dark conditions.

Location # 6: 161st Avenue and Highway 1416

The 161st Avenue and Highway 1416 intersection is the southerly end of New Underwood Road, located in New Underwood. The following photo was taken during the site visit.

Figure 47 - Study Intersection 6: 161st Avenue and Highway 1416



The intersection of 161st Avenue with Highway 1416 is controlled by yield sign. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. There were no crashes reported during the five-year analysis period from 2018 to 2022.

This is a tee intersection, with 161st Avenue yielding to Highway 1416. Yield control seems appropriate given the good visibility at the intersection. This is a busy intersection surrounded by development. The

speed limit of 35 mph on all approaches seems appropriate given the amount of access and development in proximity.

To improve the traffic operations and safety at the intersection, potential alternatives include:

- Better access management in the northwest and northeast quadrants of the intersection would improve intersection safety.

Location # 7: 156th Avenue and Highway 1416

The 156th Avenue and Highway 1416 intersection is located west of New Underwood. The following photo was taken during the site visit.

Figure 48 - Study Intersection 7: 156th Avenue and Highway 1416



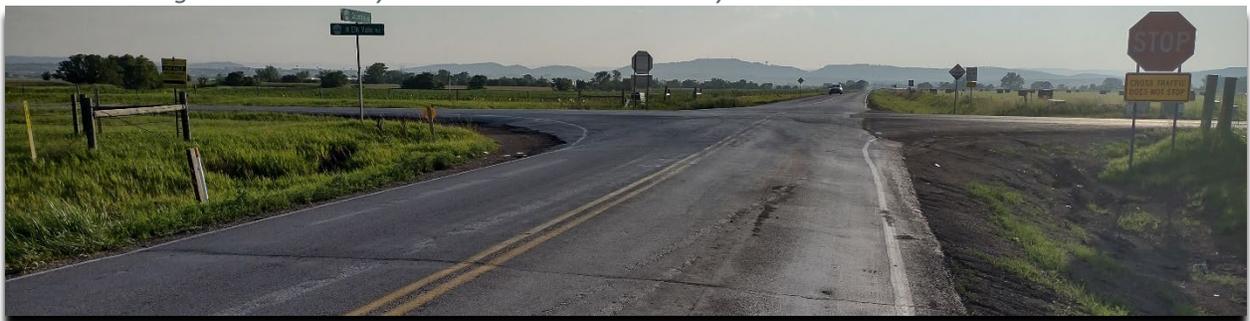
This is a tee intersection, with 156th Avenue stopping for Highway 1416. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. There were no crashes reported during the five-year analysis period from 2018 to 2022.

156th Avenue has a downward slope to the intersection. There are no turn lanes or lighting. The visibility at the intersection is satisfactory. No improvements were identified.

Location # 8: Country Road and Elk Vale Road

The Country Road and Elk Vale Road intersection is located one mile north of I-90. The following photo was taken during the site visit.

Figure 49 - Study Intersection 8: Country Road and Elk Vale Road



The intersection has east-west stop signs on Country Road. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. This intersection ranks 8th among the top 10 most frequent crash intersections in the county. There were 13

crashes reported during the five-year analysis period from 2018 to 2022. Among these, angle crashes (eight) were the predominant type. This includes two incapacitating crashes that occurred during dark conditions under no intersection lighting. The primary contributing factors for these incidents were failure to yield and disregarding the traffic control. There are no turn lanes or lighting at the intersection. The visibility at the intersection is satisfactory during daylight.

To improve the traffic operations and safety concerns, potential alternatives include either one or a combination of:

- Adding intersection lighting would be beneficial. It will improve visibility during dark conditions.
- Consider implementing advanced warning signs and rumble strips well before the intersection on Country Road to alert drivers about the upcoming stop signs. This helps in preparing drivers for the stop and reducing the chances of running the stop signs.

Location # 9: Sheridan Lake Road and US Highway 385

The Sheridan Lake Road and US Highway 385 intersection is located about 10 miles southwest of Rapid City. The following photo was taken during the site visit.

Figure 50 - Study Intersection 9: Sheridan Lake Road and US Highway 385



This is a tee intersection, with Sheridan Lake Road stopping for US Highway 385. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045.

There were 11 crashes (two incapacitating, one non-incapacitating, one possible, and seven non-injury crashes) reported during the five-year analysis period from 2018 to 2022. Single vehicle crashes were the most prominent type (ten crashes) and mostly along westbound direction. Nine of the 11 crashes were during dark conditions under no lighting. The contributing factors for the crashes were speeding and collisions with wild animals.

There are no turn lanes on US Highway 385 and a left turn lane exists for traffic turning off Sheridan Lake Road. There is no intersection lighting. There is a hill crest north along US Highway 385 that limits visibility for traffic turning left from Sheridan Lake Road to travel south.

To improve the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Adding intersection lighting would be beneficial. It will improve visibility during dark conditions. Adequate lighting can help drivers see potential hazards and reduce the risk of crashes.
- Placing advanced warning signs along US Highway 385 to alert drivers to the upcoming tee intersection, especially considering the hill crest that limits visibility.
- Consider installing flashing warning lights or beacons to enhance the visibility of the intersection, particularly during low-light conditions or when there's a higher risk of crashes.
- Consider implementing advanced warning signs well before the intersection on Country Road to alert drivers about the upcoming stop signs. This helps in preparing drivers for the stop and reducing the chances of running the stop signs.
- Consider installing signs warning drivers about the potential for wildlife crossings in the area. This may help drivers anticipate and respond to the presence of animals on the road.

Location # 10: Universal Drive and Sturgis Road

The Universal Drive and Sturgis Road intersection is located west of Deadwood Avenue. The following photo was taken during the site visit.

Figure 51 - Study Intersection 10: Universal Drive and Sturgis Road



This intersection has a private approach on the west side and east-west stop control on Universal Drive. Both Universal Drive and Sturgis Road carry heavy truck traffic. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045.

There were 10 crashes (two non-incapacitating, one possible, seven non-injury crashes) reported during the analysis period from 2018 to 2022. Single vehicle related crashes (five) were the most prominent type of crashes at the intersection. Four of the five single vehicle crashes were during dark conditions under no lighting. The contributing factors for the crashes were speeding and collisions with wild animals.

The radii on Universal Drive at Sturgis Road are large, which aids in accommodating the high truck traffic. There are no turn lanes and limited shoulders on Universal Drive. There is no intersection lighting. Sturgis Road operates as a 3-lane section and the visibility at the intersection is satisfactory under daylight conditions. There are bushes in the southwest quadrant of intersection which obstruct views for the private approach on the west side of the intersection.

To improve the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Adding intersection lighting would be beneficial. It will improve visibility during dark conditions.
- Trimming the bushes in the southwest quadrant of the intersection to improve sightlines for the private approach on the west side, reducing the risk of collisions.
- Enhance shoulders on Universal Drive to provide more space for vehicles, especially trucks. Adequate shoulders can improve safety and accommodate vehicles that may need additional space.

Location # 11: Neck Yoke Road and South Rockerville Road

The Neck Yoke Road and South Rockerville Road intersection is located about 1 mile south of Rockerville. The following photo was taken during the site visit.

Figure 52 - Study Intersection 11: Neck Yoke Road and South Rockerville Road



This tee intersection has stop control on the Neck Yoke Road approach. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. There was only one crash resulting in possible injury reported during the analysis period from 2018 to 2022.

There are no turn lanes or intersection lighting. There are sight distance issues due to the curvature of Rockerville Road to the north and hill crests to the south and east. Rockerville Road is posted at 40 mph and Neck Yoke Road is posted at 35 mph. Shoulders have been constructed at the intersection to provide additional maneuvering space.

To improve the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Adding intersection lighting would be beneficial. It will improve visibility during dark conditions.
- Evaluate options to improve sight lines, considering the curvature of Rockerville Road to the north and hill crests to the south and east.
- Consider installing rumble strips on the east approach to alert drivers about the upcoming intersection and encourage them to reduce speed, especially if they are approaching the intersection too quickly.

Location # 12: Covington Street and Twilight Drive

The Covington Street and Twilight Drive intersection is in Rapid Valley. The following photo was taken during the site visit.

Figure 53 - Study Intersection 12: Covington Street and Twilight Drive



This tee intersection has stop control for Covington Street. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. There was only one crash resulting in no injury severity reported during the analysis period from 2018 to 2022. There is a positive offset to Dorothy Drive which is unlikely to cause problems. There are many private accesses in proximity to the intersection. Left turn lanes are available on both roads. The intersection is not lighted but there is good visibility. No recommendations are provided.

Location # 13: Concourse Road and Twilight Drive

The Concourse Road and Twilight Drive intersection is in Rapid Valley. The following photo was taken during the site visit.

Figure 54 - Study Intersection 13: Concourse Road and Twilight Drive



The intersection has north-south stop control and left turn lanes on north, east and west approaches, as well as a right turn lane on the east approach. The intersection experiences unacceptable delay and LOS under the existing 2023 PM peak conditions and is expected to continue to deteriorate through 2045 if no improvements are made.

There is minimal lighting available along Twilight Drive and there is a crest vertical curve along the west approach. There were seven crashes (one non-incapacitating, six no injury) reported during the five-year analysis period from 2018 to 2022. Six out of the seven crashes were angle crashes. The primary contributing factor for the crashes was failure to yield. The uninterrupted flow on Twilight Drive creates minimal gaps for vehicles on Concourse Rd to enter Twilight Drive. Under such circumstances motorists from the minor streets could often take risks when entering the major street due to excessive delay and driver frustration. The intersection does not meet traffic signal or multi-way stop control warrants under existing traffic volumes but are expected to meet Warrant 3: Peak Hour, and close to meeting Warrant 1A: Eight Hour Minimum Vehicular Volume by projected 2045 future traffic volumes.

To improve the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Consider providing a connection from Concourse over to Jubilee Lane. That would result in many of the left turns to occur from Jolly Lane onto Twilight Drive, which may be a better location for a new traffic signal. With this change, the Jolly Lane/Twilight Drive intersection should be evaluated to determine whether it would meet warrants now or in the near future.
- Adjusting the approach angles and lane configurations can enhance safety.
- Enhancing lighting along Twilight Drive to improve visibility during nighttime conditions.
- Adjusting the crest vertical curve along the west approach to improve visibility for drivers.
- Installing advanced warning systems, such as flashing beacons or variable message signs, to alert drivers of the upcoming intersection.
- Monitoring the traffic volumes at the intersection to identify when the intersection will meet traffic signal or multi-way stop control warrants.

Location # 14: Old Folsom Road and Lower Spring Creek Road

The Old Folsom Road and Lower Spring Creek Road intersection is located about eight miles south of Rapid Valley. The following photo was taken during the site visit.

Figure 55 - Study Intersection 14: Old Folsom Road and Lower Spring Creek Road



Old Folsom Road tees into Lower Spring Creek Road in the middle of a sharp horizontal curve. There is a private approach just west of the intersection and an at-grade railroad crossing a short distance south of

the intersection. There are upward grades from the intersection both to the north and west. There are no turn lanes or intersection lighting. Folsom Road stops for Lower Spring Creek Road.

The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. The minor street volume is projected to be under 100 vehicles a day in the year 2045, which is generally low. There was only one crash resulting in no injury severity reported during the analysis period from 2018 to 2022.

Given the current conditions and the projected traffic volumes at the intersection of Old Folsom Road and Lower Spring Creek Road, it seems that the operational and safety issues are relatively low. However, there are always opportunities for improvement and preventive measures. To improve the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Installing intersection lighting to enhance visibility during low-light conditions, such as dawn, dusk, or nighttime.
- Placing advanced warning signs indicating the upcoming curve and intersection.
- If feasible and beneficial, consider minor adjustments to the intersection alignment to improve sightlines and enhance safety.

Location # 15: 151st Avenue and Highway 1416

The 151st Avenue and Highway 1416 intersection is located one mile east of Liberty Boulevard in Box Elder.

Figure 56 - Study Intersection 15: 151st Avenue and Highway 1416



This tee intersection has southbound stop control on 151st Avenue. The intersection and its approaches are expected to operate with acceptable delay and LOS under the AM and PM peak hours through 2045. There were no crashes reported during the five-year analysis period from 2018 to 2022. The intersection has a significant skew, with a posted 25-mph curve extending to the north. Other than visibility concerns with the skew, the intersection appears to have adequate sight distances. There is also a private approach

in very close proximity to the north side of the intersection. To improve the traffic operations and safety concerns, potential alternatives include either one or combination of:

- Correcting the significant skew of the intersection to improve overall safety and sightlines.
- Evaluating the private approach on the north side of the intersection and consider modifying it to improve its location in relation to the intersection.

CHAPTER 5 - EXISTING CONDITIONS SUMMARY

The data collection period, SAT meetings 1 through 3, and Public Input Meeting (PIM) 1 served to gather as much information as possible from a variety of data sources, Pennington County staff, residents and stakeholders about existing transportation conditions and issues within the study area. This comprehensive method of gathering transportation information was valuable in determining the biggest issues needing attention during the development of this MTP.

Suggestions for transportation improvements have been provided by County stakeholders, members of the public and the consultant team. Issues mentioned in addition to those identified in the Inventory of Existing Conditions are summarized as follows by category:

GROWTH

During SAT meetings, KLI and Pennington County transportation leadership discussed what the drivers for growth have been, e.g., a concentration of new development occurring southeast and southwest of Rapid City and Box Elder, EAFB, and post pandemic migration/influx which is leading to new demand for housing needs in these areas, and subsequently creating capacity and LOS impacts to the existing transportation system.

Forecasted ongoing population and employment growth and subsequent subdivision developments in both urbanized and rural areas of Pennington County have implications for both roadway and multi-modal county transportation systems; Growth changes traffic patterns and where the growth is occurring, it most notably effects traffic volumes/ADT, LOS (i.e., capacity), and safety for all users.

A key consideration for this MTP was to appropriately analyze and plan for the changing transportation needs of the identified growth areas within Pennington County (i.e., both urban and rural new subdivisions and areas identified for residential growth), as well as to forecast additional growth that is occurring and expected to continue to occur into the future.

The County's Future Land Use (FLU) plan is forthcoming in 2024. Current development policy/strategies, the Rapid City Area MPO's 2024-2027 Transportation Improvement Plan (TIP), and existing and projected 2045 roadway data pertaining to volumes, LOS, and safety analysis, were used to inform the new projects identification in **Chapter 8**. **Chapter 5** provides detailed mapping of the baseline conditions data inputs used, and graphically summarizes identified growth areas and associated roadways, composited using GIS, to inform recommendations for new projects.

ROADWAY

Based on collected baseline conditions data, SAT 1, SAT 2, and SAT 3 feedback, and PIM 1 information gleaned from public input, the following highlights key County roadway issues and needs.

KLJ used Streetlight data as an Origin/Destination (OD) tool to determine trip generation and identify existing and future areas where roadway capacity (volume/ADT and LOS) needed to be analyzed, and recommendations made for future project identification.

Potential New County Roads/Routes

County staff identified, and KLJ verified via traffic analysis, the potential/viability of a new connector route between Rapid Valley and Radar Hill Road. A new route, to be determined, would alleviate existing and projected LOS and capacity issues on existing roads in this area of the County which is experiencing major growth.

Jurisdiction

Interstate 90 Service Rd from Elk Vale Rd is a documented high crash intersection. This road segment, heading east approximately 1.5 miles is projected to have high truck traffic. In the long-term, there is need for capacity improvements and the road is a candidate for potential jurisdictional transfer to Box Elder.

Functional Classification

There is the need for coordination of Pennington County road functional classifications with the RCAMPO Major Street Plan (MSP) and SDDOT classifications.

- May need to adjust boundaries, sharing data with firms, possibly some reclassifications.
- Road Classifications and alignments need to match up between MPO and Pennington County MTP
 - Rapid City Major Streets Plan
 - Dunsmore area classification
- DOT standards, project MPO models do not include EAFB project (4,000 to 5,000 new residents)

Traffic Volumes

It was noted by the SAT that traffic volume counts were updated in January (2020-2023). KLJ verified AADT count dates which were confirmed to have been conducted in May 2023.

Roadway Surface and Pavement Management

KLJ and the SAT discussed paving threshold recommendations in the MTP. There is a need to:

- Incorporate the most up to date *Pavement Condition Index Report Data* available from the County to inform identification of future maintenance and/or pavement projects
 - The update to the previous Pavement Conditions study is pending
- Chip sealing new development is an alternative to asphalt pavement.
 - Current County Pavement Conditions Index (old) averaged a score of 87 (network wide).
- Identify future developments.
- Have accurate O/D Streetlight data and maps which assist the process for prompting approval/validating road upgrades.
- “Gravel to Pavement” Thresholds should be based on 200-250 AADT
 - Ordinance 14 – reports a 250 ADT on certain gravel roads. KLJ and County staff used this information for gravel to pavement project candidates as well as for new road classification recommendations where needed.
- Gravel Maintenance Issues

- The county received a recent summer 2023 dust complaint at Rochford Rd.
- Gravel road conditions/maintenance is an issue at the following locations based on PIM 1 feedback: Creighton, Babcock, and Sage Creek roads.
- Rochford Road segments are a candidate: to be chip sealed/paved in the future.
 - Rochford Road traffic will increase once paved.
- KLJ recommends a budget model for future maintenance budget/plans.
- Pennington County staff noted that 50% of the County's road network is gravel.
 - Dust concerns on busy gravel roads, including those near/around Wall pose ongoing maintenance issues.
 - Issues can partially be addressed with new ATV/UTV transportation policy and ordinances.
- Road Districts are common
- There are several platting jurisdictions in cities in Pennington County
 - Underwood
 - Hermosa
 - Boxelder
 - Hill City
 - *Rapid City: Platting jurisdiction is w/in 3-mile zoning district for standards – (Communications, routing, etc.)

Farm to Market Roads

County staff noted Agricultural/Ranching based traffic is being generated and affecting the following roads. These roads and associated intersections were considered for new project selection.

- Creighton Road
- Quinn Road / Pedro Road
- Sage Creek / Sage Brush
- Baseline
- 233rd

Emergency Response Issues

The MTP also considered the needs of emergency responders in the county, including ambulance/EMS providers and rural fire departments. Pennington County is served by six ambulance services. They are a mix of paid career professionals and volunteers:

- Wall Ambulance District
- Keystone Ambulance
- Hill City Ambulance
- Rapid City Ambulance
- Piedmont Ambulance in Meade County
- Ellsworth Air Force Base Ambulance

Pennington County is served by several fire departments/districts. There are 20 fire districts in the county, only two are non-volunteer, the remainder are staffed by volunteers. There are also five additional federal fire departments. These fire districts contain 34 fire stations which serve Pennington County and often surrounding counties as well. County fire administrators, fire department staff, and EMS providers identified transportation issues in the county.

- Roads in the Conata Basin area including Sage Creek, Bear Creek, and the Scenic area are difficult for fire equipment to navigate.
- Northbound roads from Wall and Quinn and roads serving the northeast portion of the county often have high truck traffic and are difficult for firefighters to navigate.
- Signage along Rochford-South Rochford roads are sometimes inaccurate.
- County Highway 1416 through Box Elder is difficult for providers, with particular difficulty at railroad crossings on cross streets (Radar Hill Rd, Ellsworth Rd, Liberty Blvd).
- EMS providers in Keystone mentioned difficulty with navigating Foster Gulch Rd during summer tourist season, however this is a Forest Service road and they are already aware of the issue.

BRIDGES AND CULVERTS

The County currently has 16 bridges rated in *Poor* condition, 38 bridges in *Good* condition, and 73 Bridges in *Fair* condition. **Table 15** lists the County bridges currently in poor condition which are candidates for short- and long-term projects.

Table 15 – Bridge and Culverts in Poor Condition

Facility	Bridge ID	Feature Intersected	District	County	Notes
SLATE PRAIRIE ROAD	52141325	CASTLE CK	Rapid City	52 PENNINGTON	--
NORRIS PEAK ROAD	52308298	RAPID CK	Rapid City	52 PENNINGTON	Rehabilitation work in 2024
THUNDERHEAD FALLS	52316316	RAPID CK	Rapid City	52 PENNINGTON	Replacement work under contract for 2024.
THUNDERHEAD FALLS	52316317	RAPID CK	Rapid City	52 PENNINGTON	Replacement work under construction in 2024.
THUNDERHEAD FALLS	52317313	RAPID CK	Rapid City	52 PENNINGTON	Structure replacement scheduled for 2025
THUNDERHEAD FALLS	52317318	RAPID CK	Rapid City	52 PENNINGTON	--
THUNDERHEAD FALLS	52318318	RAPID CK	Rapid City	52 PENNINGTON	52318318 is not programed for construction at this time, no funding is avail.
THUNDERHEAD FALLS	52320312	RAPID CK	Rapid City	52 PENNINGTON	--
COUNTRY ROAD	52444270	BOX ELDER CK	Rapid City	52 PENNINGTON	--
HAMMERQUIST ROAD	52575383	RAPID CK	Rapid City	52 PENNINGTON	--
234TH STREET	52582350	Trib to Rapid Ck	Rapid City	52 PENNINGTON	--
159TH AVE	52590291	BOXELDER CK	Rapid City	52 PENNINGTON	--

Facility	Bridge ID	Feature Intersected	District	County	Notes
HUETHER ROAD	52896490	TRIB TO CHEYENNE RIVER	Rapid City	52 PENNINGTON	To be replaced in 2024
223RD STREET	52909240	TRIB TO CHEYENNE RIVER	Rapid City	52 PENNINGTON	--
PAULSEN RD	52952341	COTTONWOOD CK	Rapid City	52 PENNINGTON	To be replaced in 2024
PAULSEN RD	52953340	COTTONWOOD CK	Rapid City	52 PENNINGTON	To be replaced in 2024

MULTI-MODAL TRANSPORTATION

The MTP is a “multi-modal” plan, however based on feedback from the SAT, pedestrian and bicycle projects are not a county priority. Based on that feedback, pedestrian/bicycle projects should be considered on a case-by-case basis and efforts can be focused to widen road shoulders for bicycle use where needed and couple these bicycle projects with pavement improvement projects as they occur. The following points were discussed during SAT meetings regarding the various modes of multi-modal travel.

Freight

Freight infrastructure and modes were reviewed by KLJ and the County during SAT meetings. Freight future needs analysis assessed Truck volumes on County roadways, and evaluated key freight generators, origin/destinations, such as the Transload facility and rail lines. Freight strategies are addressed where applicable as they pertain to roadway LOS, safety, volumes, and maintenance. Potential truck traffic issues to note include the following road locations and truck traffic generators:

- Affected Roadways:
 - Deerfield and China Gulch Roads
 - Heavy truck traffic
 - Nemo Road – Pennington County Trucks hauling from gravel pits.
 - Want/need for designating haul roads
 - Truck traffic should ideally use Hwy 79.
 - Hwy 1416
 - Old Dominion hub
 - Reservoir Rd (off Longview)
 - Old Folsom
- Truck Traffic Generators
 - Transload Facility
 - J&J
 - Plastics (Industrial Area) freight
 - Rubble Site near Box Elder
 - Gravel Pit in Mead Co.
 - Boxelder dump / 51st?
 - Iron Ore mine in Lawrence Co
 - Gravel Pit in Meade Co
 - Old Folsom possible industrial area

ATV/UTV Facilities

Existing conditions for ATV/UTV Facilities and Usage were reviewed. KLJ made an inquiry to better understand crash data specifically for ATV/UTV incidents, however that data is mostly unavailable. KLJ and the county discussed further desktop analysis of any existing UTV studies that would provide precedent to inform UTV usage policy and maintenance for ongoing impacts to the county gravel/unpaved road system. Based on PIM 1 feedback, the following issues have been documented by the public:

- UTV traffic and overloaded trucks have increased, impacting County roads
- UTV safety along Reno Gulch – curves and no shoulders
- Users are traveling on the county road system to access trail heads for recreational use
- Hill City has highly active UTV usage/activity
 - County uses MgCl for dust control
- KLJ will obtain trail locations and facilities from the Forest Service and document within the MTP

Nonmotorized Facilities: Pedestrian and Bicycles

Consideration for county road shoulder widths is to be identified for potential on-road bicyclists. The County should consider recommended 4' biking width shoulders to roadways along Sheridan Lake Road, Upper and Lower Spring Creek Roads, Nemo Road, Deadwood Avenue, Old Hill City Road, Moon Meadows Drive, and Rochford Road. Pennington County staff has noted that most bikers are using major roads/interstate for long distance recreation uses.

- KLJ denoted any roadways that have existing 4 ft. shoulders.
- Omaha and Campbell (TAP project) resulted in new bicycle facilities along those corridors.

Other pedestrian/bicycle issues, needs, and considerations include:

- Provide an off-street/road bicycle path connection from Rapid City to mountain biking trailheads in the Black Hills area:
 - Maintenance of any new facilities is a concern both by the County and residents.
 - Consider joint projects for multi-use paths
- Higher need for bike/ped facilities in the urban and developed areas.
 - The RCAMPO has not heard much feedback from the public regarding multiuse paths/bicycle routes regarding the Radar Hill area.

Air Transportation

As county roads in the vicinity of RAP become more and more utilized due to growth, there is the potential for new County Roads/Routes and consideration for the viability of new connector route(s) in the Rapid Valley to Radar Hill Road vicinity. Having adequate future LOS and capacity in the vicinity of RAP will be key in both providing efficient access to the airport, as well as meeting the roadways needs for users living and working in this area of Pennington County. There is an existing need to coordinate County roadway planning with RAP long-range plans.

Transit

Transit improvement issues and needs are ongoing and improvements and/or extensions of service are highly based on available funding. Known ongoing transit issues/needs include the following for RTS.

- Supplement the existing transit system to include night/weekend hours of operation and service to surrounding communities. Introduce evening service on a limited basis first to test
- Educate the entire community about available transit services
- Need to develop a collaborative approach among service providers
- Need more service between EAFB and Rapid City
- No budget for extending transit routes outside Rapid City limits
 - Not cost effective to run transit to airport.
- Prairie Hills Transit provides some transit outside of Rapid City Limits
- Black Hills Works is an existing last-mile type transit service.

TRAFFIC

Operations

Intersection delays and LOS were reviewed by KLJ and discussion with county for known problem intersections:

- It was noted that improving signal timing could reduce delay at Sheridan/Dunsmore.
 - Provision of left turn projected phases could improve safety and reduce delay
 - This was identified as a new project for inclusion in the MTP
- Also noted that the intersection of Concourse/Twilight at Northbound and Southbound approaches experience a LOS delay
 - A connection from Concourse to Jubilee Lane may be a good option to enhance traffic operations along Twilight Road, both at Concourse and at Jubilee Lane.

Crash Safety Analysis

Consideration was provided for areas of high frequency crashes and crash severity (fatal or serious injury). Recommendations were given to address identified deficiencies on a case-by-case basis.

Traffic Impact Studies

Traffic Impact Study (TIS) requirements should be clearly outlined within County Ordinances. Planned growth of sufficient size to warrant a TIS will need to be determined, and the analysis methods will be provided to allow consistent development and review. This will include requirements for the level of financial participation to upgrade nearby transportation facilities that are expected from developments.

PROJECT IDENTIFICATION

Identifying areas of growth in the County was a key first step in the process of **new** project identification. A composite GIS analysis of the key identified urban and rural growth areas listed previously in **Table 2 - County Growth Areas: Urban and Rural**, the baseline conditions inventoried in this **CHAPTER 3**, and traffic volumes, operations, and safety analysis in **CHAPTER 4**, provided the basis for the identification of **new** projects.

The following existing conditions data sets from Chapter 3 and Chapter 4 were analyzed to identify transportation system deficiencies that currently exist or are anticipated to exist in the future horizon year 2045. The GIS data, with additional desktop analysis, assisted in the identification and prioritization of *new* County transportation projects.

1. Transportation Analysis Zones (RCAMPO Area)
2. Identified Growth Areas: rural, urban, and urbanizing
3. Household and Job Growth (2018-2025 – RCAMPO Area)
4. Projected ADT 2045 - greater than 250 (County Roads Only)
5. Projected Truck ADT 2045 - greater than 250 (County Roads Only)
6. Paved County Roads – Pavement Condition Index < 70 (2012)
7. Potential for Gravel to Paved Conversion (County Roads Only)
8. Roadway and Intersection Capacity/Level of Service (LOS)
9. 15 Key Study Intersections
10. Top 10 High Frequency Crash Intersections
11. Significant County Road Dead Ends
12. Forest Service Motorized Trails on County Roads
13. Rapid City Bike Network: Existing, Planned, and Proposed Routes on or intersecting County Routes
14. Non-Motorized Trail and County Road Crossings

The following Figures 57 to Figure 60 provide documentation of the GIS analysis performed using the above data inputs for helping identify new projects.

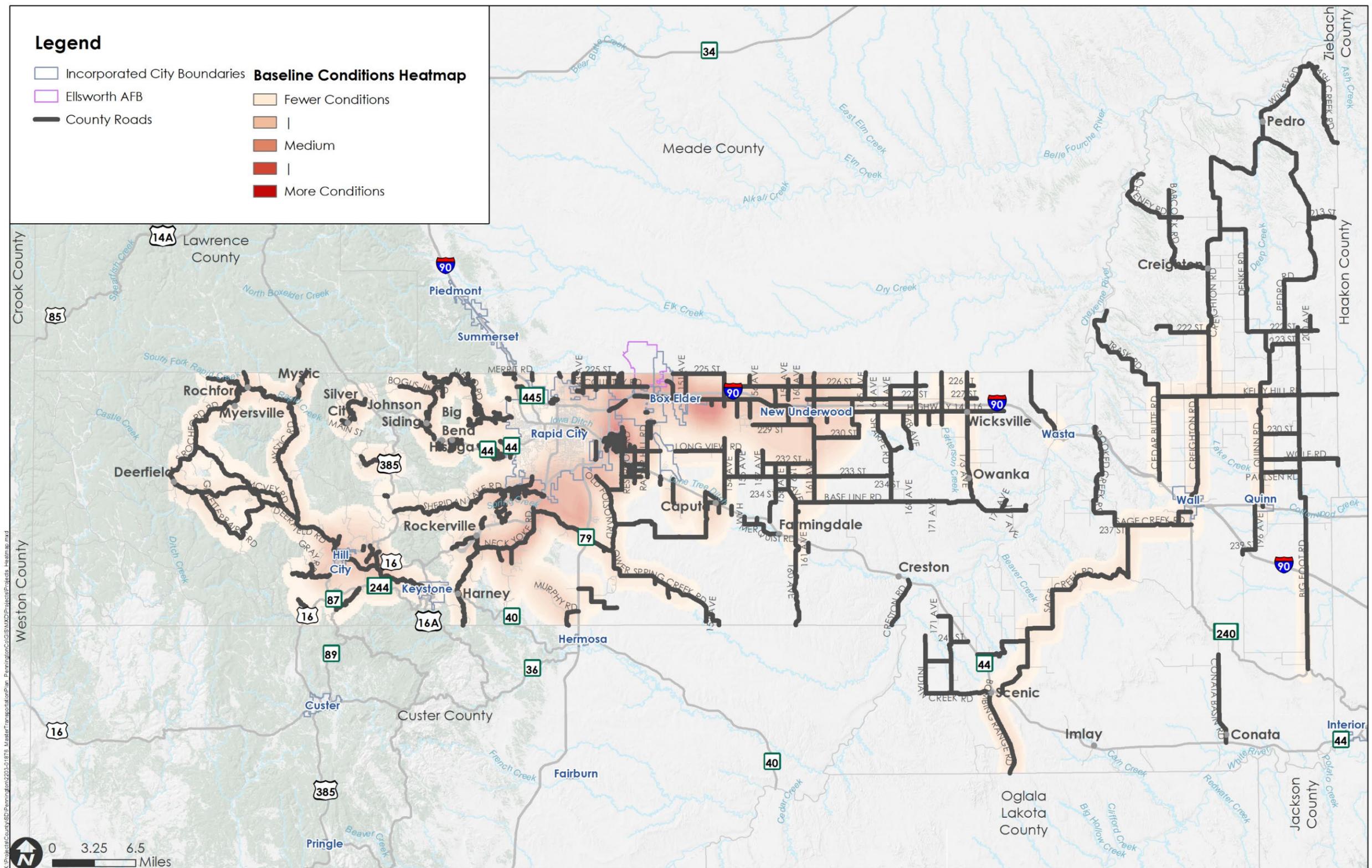
In **Figure 57**, KLJ created a heatmap of the data inputs from above to gain a geographic understanding of where in the County more of the adverse existing conditions are concentrated. You can see that more of the conditions that trigger the need for new projects exist to the east, southeast and south of metro Rapid City. Additionally, a “medium” number of conditions exists in the Hill City vicinity.

Figure 58 focuses on Transportation Analysis Zones (TAZ – from line 1 above) county wide, which verifies household and job growth is also occurring to the east (Box Elder), southeast, and south/southwest of metro Rapid City, and within the MPO’s jurisdictional area.

Figure 59 combines the TAZ data with the data points from 2 through 14 above. With the data inputs from above factored into the map, the data corresponds to the same geographic areas within the County, noted in the preceding two maps. Based on these inputs, areas of concern are noted, and specific projects can be identified, based on the data analysis. **Figure 60** is the same analysis as **Figure 59**, it is simply zoomed to the MPO area level of detail.

In Chapter 6, Transportation Standards are detailed and recommendations made where appropriate.

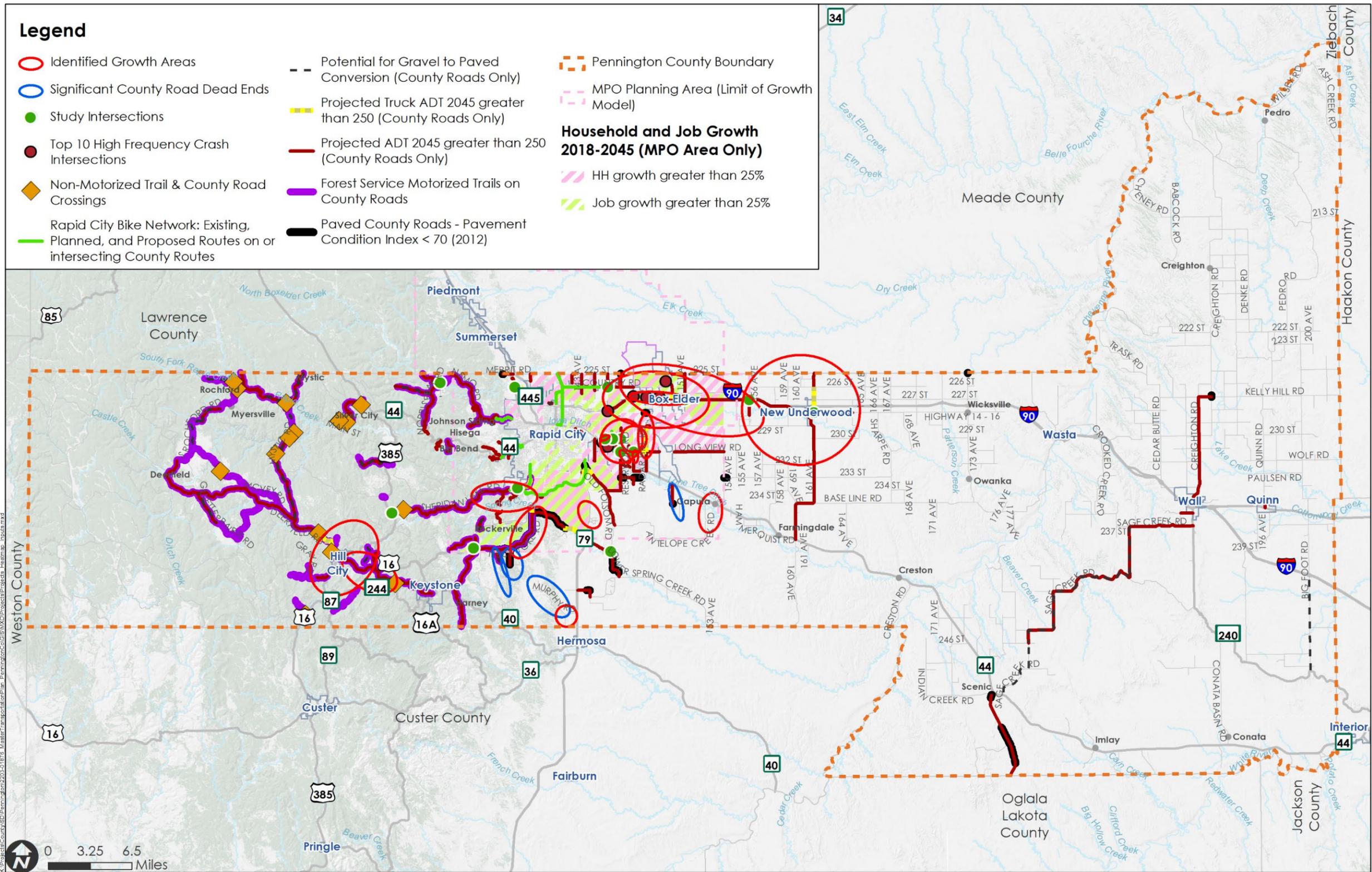
Figure 57 - Baseline Conditions Heat Map (County Wide)



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

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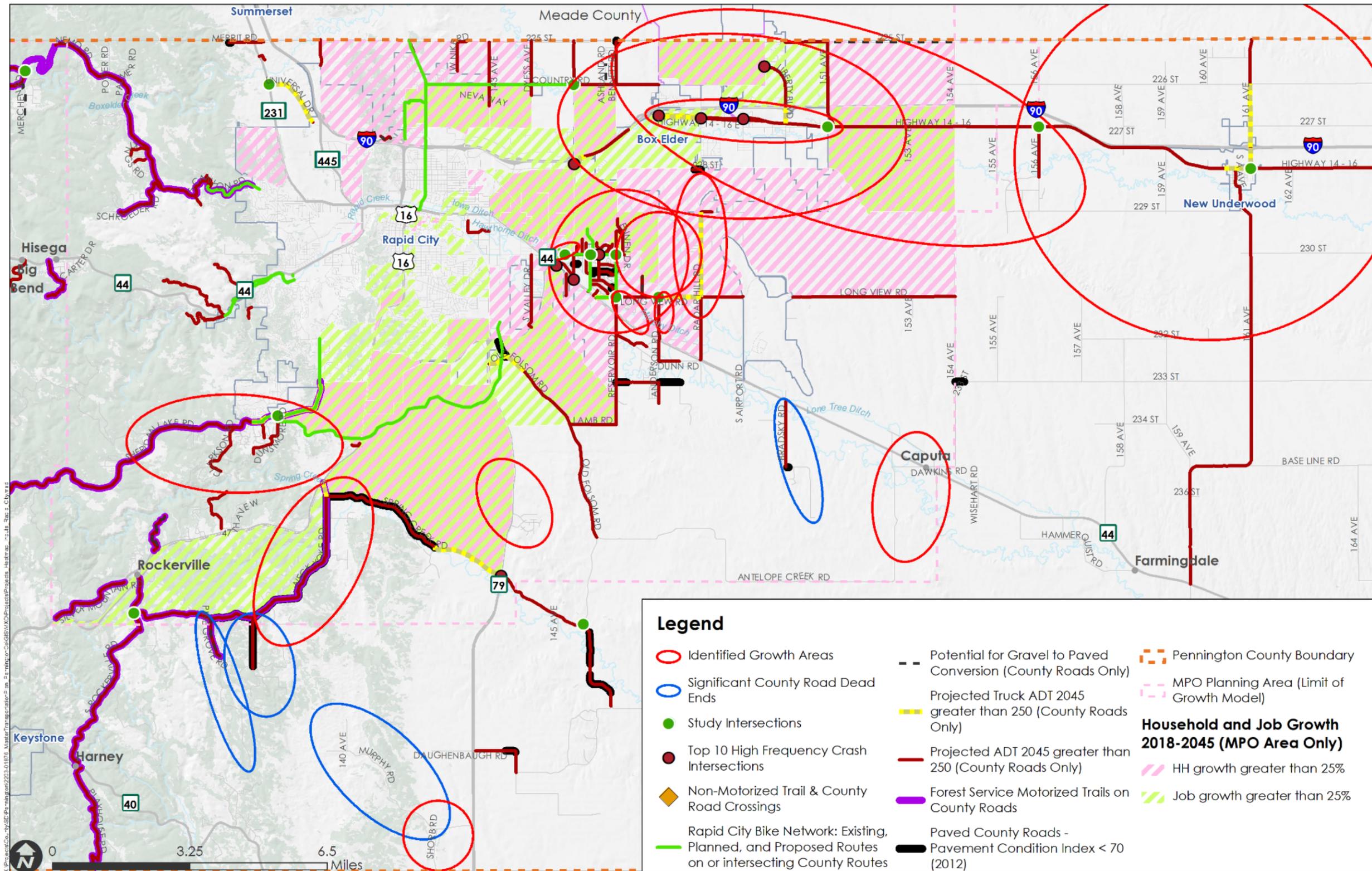
Figure 59 - Preliminary Project Identification: Heat Map Inputs (County Wide)



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLU

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Figure 60 - Preliminary Project Identification: Heat Map Inputs (MPO Area)



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLIJ

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CHAPTER 6 – TRANSPORTATION STANDARDS

INTRODUCTION

The transportation system principles and standards included in this plan serve as the foundation for developing the transportation system, evaluating its effectiveness, determining future system needs, and implementing strategies to fulfill the identified goals and objectives.

Although significant effort has been put forth in the preparation of the Highway Standards and Development Procedures, not all conditions of development, site characteristics or unusual circumstances can be addressed within this master transportation plan.

The following sections describe new and updated references for future planning of the Pennington County Road network:

- Functional Classification System
- Roadway Surface
- Cross Section Standards
- Roadway Planning Level Capacity
- Level of Service Standards
- Access Management Guidelines
- Traffic Impact Study
- Data Management / GIS

FUNCTIONAL CLASSIFICATION

The definition of each functional classification is discussed in **CHAPTER 3 – BASELINE CONDITIONS**. The Pennington County roadway classification system is based on the Highway Functional Classification system from the Federal Highway Administration (FHWA) and is expected to remain the same in almost all cases in terms of classifications.

Rapid City Area MPO Major Streets Plan – Functional Class

The Rapid City Area MPO identified changes to functional classification of roads within its planning area as part of its Major Streets Plan 2020 (MSP). Approximately 53.6 miles of existing county roads in the MSP were given functional classification designations, both existing and proposed. The remaining 144.8 miles of county roads currently within the MPO's planning area were not given functional classifications as part of the MSP. Of the 53.6 miles identified in the MSP, only 0.75 miles have the same classification in the existing county database and in the MSP. Dawkins Rd between SD Hwy 44 and Antelope Creek Rd is currently classified as a collector by the county and remains a collector in the MSP.

Table 16 summarizes the potential functional classification conversion of county roadways within the MSP from the current county functional classification to the MSP classification.

The county should work with the MPO on functional classification changes as needed when growth and development necessitate change. These roads can also be seen in **Figure 61**.

Table 16 – County and MSP Functional Classification Changes

Road	Existing County Functional Class	Functional Class in MSP	Miles	Relation to Current MPO Planning Area
154 Ave	Rural Local Road	Proposed Minor Arterial	4.46	Within
	Rural Major Collector	Proposed Minor Arterial	1.99	Colinear with Planning Area Boundary
225 St	Rural Local Road	Existing Principal Arterial	1.00	Within
	Urban Local Street	Existing Principal Arterial	1.21	Within
229 St	Rural Local Road	Proposed Minor Arterial	0.26	Within
233 St	Rural Major Collector	Proposed Minor Arterial	2.00	Beyond Planning Area
Anderson Rd	Rural Local Road	Proposed Collector	0.49	Within
	Urban Collector	Existing Principal Arterial	1.02	Within
	Urban Local Street	Proposed Collector	1.03	Within
	Urban Local Street	Proposed Principal Arterial	0.35	Within
Antelope Creek Rd	Rural Local Road	Existing Minor Arterial	0.37	Within
	Rural Major Collector	Existing Minor Arterial	7.01	Colinear with Planning Area Boundary (Portion)
	Rural Major Collector	Proposed Minor Arterial	3.48	Colinear with Planning Area Boundary (Portion)
Bradsky Rd	Rural Local Road	Existing Principal Arterial	1.64	Within
Caputa Loop	Rural Local Road	Existing Collector	1.37	Within
	Rural Local Road	Existing Minor Arterial	0.44	Within
Carlin St	Urban Local Street	Proposed Collector	0.50	Within
Dawkins Rd	Rural Major Collector	Proposed Collector	0.75	Within
	Rural Major Collector	Proposed Minor Arterial	0.67	Colinear with Planning Area Boundary (Portion)

Road	Existing County Functional Class	Functional Class in MSP	Miles	Relation to Current MPO Planning Area
Dunn Rd	Rural Local Road	Proposed Collector	0.98	Within
Everest Rd	Rural Local Road	Proposed Collector	0.07	Within
Green Valley Dr	Rural Local Road	Proposed Collector	1.16	Within
Heart Ranch Rd West	Rural Local Road	Proposed Collector	1.16	Beyond Planning Area
Hidden Valley Ln	Rural Local Road	Proposed Collector	0.10	Within
Highland Hills Rd	Rural Local Road	Proposed Collector	0.30	Within
Kitt Peak Rd	Rural Local Road	Proposed Collector	0.64	Within
Long View Rd	Rural Major Collector	Proposed Principal Arterial	3.84	Within
Lower Spring Creek Rd	Rural Major Collector	Proposed Minor Arterial	0.59	Beyond Planning Area
Meadow Ridge Dr	Urban Local Street	Proposed Collector	0.19	Within
Mercury Dr	Urban Local Street	Proposed Collector	0.24	Within
Merritt Rd	Rural Local Road	Existing Principal Arterial	0.56	Within
Morris Ln	Rural Local Road	Existing Collector	0.99	Within
Nameless Cave Rd	Rural Local Road	Proposed Principal Arterial	1.18	Within
Neva Way	Urban Local Street	Proposed Collector	0.51	Within
Pine Grove Rd	Rural Local Road	Proposed Collector	0.98	Beyond Planning Area
Potter Rd	Rural Local Road	Proposed Principal Arterial	0.79	Within
Radar Hill Rd	Rural Local Road	Proposed Minor Arterial	0.54	Within
	Rural Major Collector	Existing Minor Arterial	1.48	Within
	Urban Collector	Existing Minor Arterial	2.01	Within
Reservoir Rd	Urban Collector	Proposed Minor Arterial	0.11	Within
S Airport Rd	Rural Local Road	Proposed Minor Arterial	0.67	Within

Road	Existing County Functional Class	Functional Class in MSP	Miles	Relation to Current MPO Planning Area
Saint Germaine Rd	Rural Local Road	Proposed Principal Arterial	0.65	Colinear with Planning Area Boundary
Schroeder Rd	Rural Local Road	Proposed Principal Arterial	0.85	Within
Southside Dr	Rural Local Road	Proposed Collector	1.52	Within
Sun Ridge Rd	Rural Local Road	Proposed Collector	0.53	Within
W Nike Rd	Rural Local Road	Proposed Collector	0.91	Within
TOTAL			53.56	

SDDOT – Functional Class

In addition to changes to future functional classifications laid out in the MPO's Major Streets Plan, county road existing functional classifications were compared to functional classifications provided by SDDOT. On most county roads, functional classification does not vary from the county to the DOT. There are however approximately 72 miles of county roads that differ from SDDOT's database: 32 miles have similar classes but differ in their designation of urban or rural, while 40 miles have different classifications altogether.

SDDOT uses the FHWA definition of an adjusted urban area to determine urban and rural designations. This boundary can be seen in **Figure 62**. The county assigns urban and rural designations to roads within its own database. The county's urban roads are all within the vicinity of Rapid City, however they do not correspond with the recently approved adjusted urban area boundary, city limits, or other similar boundaries, nor do they align with the presence of curb and gutter.

Table 17 shows County roads that differ between County and SDDOT functional classifications.

Table 18 shows County roads that differ from the SDDOT only in their urban and rural designations.

County and SDDOT functional classification discrepancies are shown in **Figure 62**.

Table 17 – County and SDDOT Functional Classification Discrepancies

Road	County Functional Class	DOT Functional Class	Miles
154 Ave	Rural Local Road	Rural Major Collector	1.96
213 St	Rural Local Road	Rural Minor Collector	0.99
228 St	Urban Local Street	Urban Major Collector	0.15
Babcock Rd	Rural Local Road	Rural Minor Collector	6.69
Country Rd	Urban Collector	Urban Local Street	2.01
Dunsmore Rd	Rural Local Road	Urban Major Collector	0.90
Edelweiss Mountain Rd	Rural Local Road	Rural Minor Collector	3.21
Highway 1416	Urban Minor Arterial	Urban Major Collector	1.11
	Rural Major Collector	Rural Minor Collector	7.63
	Rural Major Collector	Rural Minor Collector	0.66
Liberty Blvd	Urban Collector	Urban Minor Arterial	1.64
Moon Meadows Drive	Rural Local Road	Urban Major Collector	2.03
Pink Cabin Rd	Rural Local Road	Rural Minor Collector	1.14
Rochford Rd	Rural Local Road	Rural Minor Collector	3.37
Sheridan Lake Rd	Urban Minor Arterial	Rural Major Collector	0.98
Silver City Rd	Rural Local Road	Rural Minor Collector	4.58
South Canyon Rd	Urban Minor Arterial	Rural Major Collector	1.39
Total			40.4

Table 18 – County and SDDOT Urban and Rural Discrepancies

Road	County Functional Class	DOT Functional Class	Miles
225th St	Rural Local Road	Urban Local Street	1.00
229th St	Rural Local Road	Urban Local Street	0.26
Anderson Rd	Rural Local Road	Urban Local Street	0.49
Ashland Rd	Rural Local Road	Urban Local Street	0.62
Bennett Rd	Rural Local Road	Urban Local Street	1.05
Clarkson Rd	Rural Local Road	Urban Local Street	1.28
Croyle Ave	Rural Local Road	Urban Local Street	0.60
Dark Canyon Rd	Rural Local Road	Urban Local Street	0.42
Dunn Rd	Rural Local Road	Urban Local Street	0.98
Dunsmore Rd	Rural Local Road	Urban Local Street	0.47
Everest Rd	Rural Local Road	Urban Local Street	0.19
Fort Hayes Dr	Rural Local Road	Urban Local Street	0.24
Green Dr	Rural Local Road	Urban Local Street	0.36
Green Oak Ln	Rural Local Road	Urban Local Street	0.30
Green Tree Dr	Rural Local Road	Urban Local Street	0.23
Green Valley Dr	Rural Local Road	Urban Local Street	1.16
Green Willow Dr	Rural Local Road	Urban Local Street	0.37
Greenfield Dr	Rural Local Road	Urban Local Street	0.66
Greenfield Ln	Rural Local Road	Urban Local Street	0.18
Greenwood Ln	Rural Local Road	Urban Local Street	0.50
Hickory Dr	Rural Local Road	Urban Local Street	0.25
Hidden Springs Rd	Rural Local Road	Urban Local Street	0.98
Highland Hills Rd	Rural Local Road	Urban Local Street	0.30
Highway 1416	Rural Major Collector	Urban Major Collector	1.52
Hurst Ave	Rural Local Road	Urban Local Street	0.12

Road	County Functional Class	DOT Functional Class	Miles
I-90 Service Rd S	Rural Local Road	Urban Local Street	1.55
Kerry Dr	Rural Local Road	Urban Local Street	0.43
Kitt Peak Rd	Rural Local Road	Urban Local Street	0.64
Langenberg Ct	Rural Local Road	Urban Local Street	0.05
Long View Rd	Rural Major Collector	Urban Major Collector	1.00
Marcia Ct	Rural Local Road	Urban Local Street	0.08
Merritt Rd	Rural Local Road	Urban Local Street	0.82
Mesa Dr	Rural Local Road	Urban Local Street	0.50
Mittenwald Ct	Rural Local Road	Urban Local Street	0.11
Morning View Dr	Rural Local Road	Urban Local Street	0.50
Morris Ln	Rural Local Road	Urban Local Street	0.99
Mountain Pine Ln	Rural Local Road	Urban Local Street	0.23
Mystic Dr	Rural Local Road	Urban Local Street	0.25
Nike Rd W	Rural Local Road	Urban Local Street	0.91
Nonanna St	Rural Local Road	Urban Local Street	0.38
Okpealuk Ct	Rural Local Road	Urban Local Street	0.07
Okpealuk St	Rural Local Road	Urban Local Street	0.54
Old Folsom Rd	Urban Collector	Rural Major Collector	0.61
Pinewood Dr	Rural Local Road	Urban Local Street	0.23
Radar Hill Rd	Rural Major Collector	Urban Major Collector	1.48
Radar Hill Rd	Rural Local Road	Urban Local Street	0.54
Reservoir Rd	Rural Major Collector	Urban Major Collector	2.14
Southside Dr	Rural Local Road	Urban Local Street	1.52
Spring Canyon Trl	Rural Local Road	Urban Local Street	0.35
Sunnyside Dr	Rural Local Road	Urban Local Street	0.37
Sunnyside Dr S	Rural Local Road	Urban Local Street	0.38

Road	County Functional Class	DOT Functional Class	Miles
Sunnyside Dr W	Rural Local Road	Urban Local Street	0.25
Vista Dr	Rural Local Road	Urban Local Street	0.25
Wamberg Ct	Rural Local Road	Urban Local Street	0.03
Total			31.70

Functional Classification Recommendations

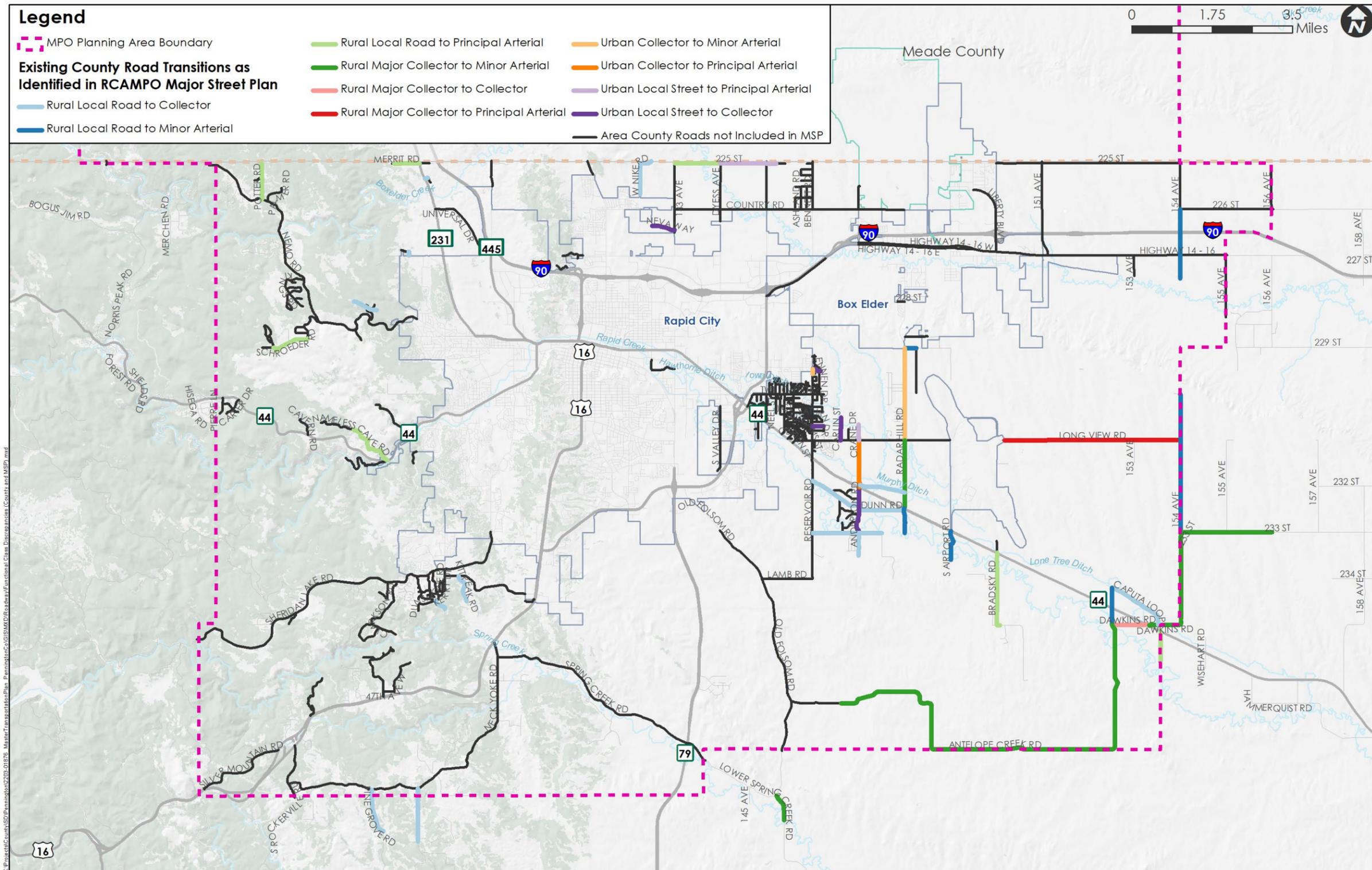
It is recommended that one of the following occur to maintain Functional Classification continuity between the State, County, and the RCAMPO:

- 1) Update all County Road functional classification designations to match SDDOT designations. The county should also consistently apply urban and rural designations to match SDDOT.
- 2) County Road Jurisdiction and Functional Classification should be *congruent with MPO functional class inside the MPO jurisdictional area*, and *congruent with SDDOT outside of the MPO area*.

*Note that road pavement type i.e., gravel or pavement and the absence or presence of “curb and gutter” could be used as a factor for helping determine functional classification, especially for “urban” roads (e.g., inside the MPO or FHWA boundary). Two examples for potential functional classification revision include:

- *Longview Rd (See Tables 16 and 18)
- *Country Rd. (See Table 17)

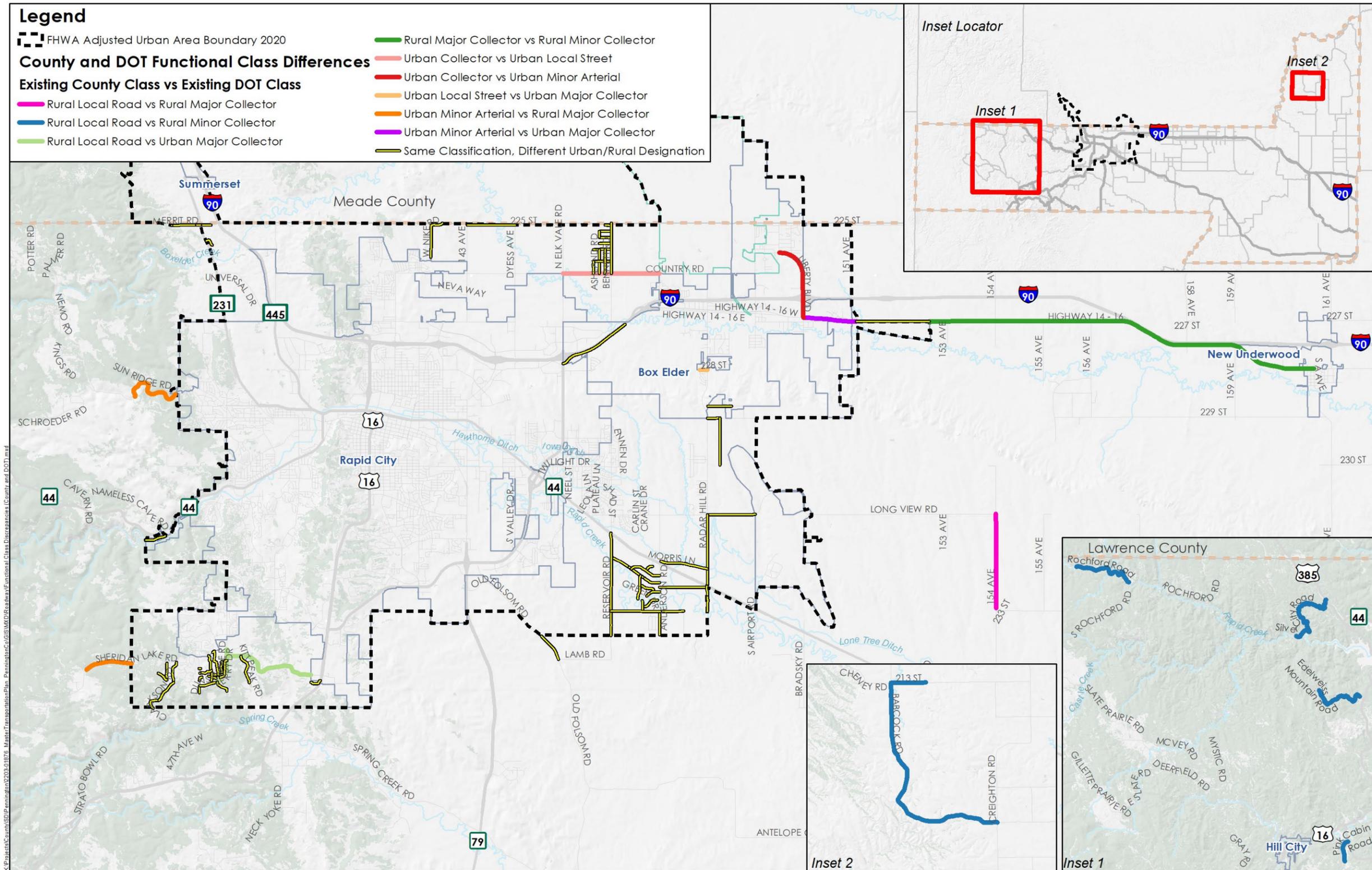
Figure 61 – County and MSP Functional Class Changes



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

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Figure 62 – County and SDDOT Functional Class Discrepancies



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLJ

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ROADWAY SURFACE

The use of FHWA's functional classification system may not always be suitable for designing road standards. For instance, a road classified as a collector may be paved or unpaved and can accommodate various types of vehicles such as personal cars or semis. This classification may not fully address all the variables associated with the road's characteristics. As a result, a customized standard has been developed specifically for Pennington County. This plan will assist in future road designs and project planning, taking into consideration the type of pavement used and the routes for heavy vehicles as the main factors. The Roadway Plan for Pennington County places emphasis on the operations, safety, access, and freight capacity of the county roads.

Gravel Roads

Although they may not have the same level of regional connectedness as paved county roads, county primary gravel roads facilitate connectivity. They generally carry less traffic (under 250 daily vehicles) than paved highways, which is perhaps why they have not previously been paved.

Paved Roads

The roadways in Pennington County that support the greatest degree of interregional connectivity also carry the highest traffic and the heaviest loads. They generally transport over 500 vehicles per day. Since these routes link towns, these can also draw bicyclists. These roadways are frequently high-speed infrastructure in Pennington County. Wide shoulders, generally between four and six feet, and recoverable 4:1 inslopes should be included in significant upgrade plans. Although they enhance regional connectivity, not all paved roads are as important as the priority routes. They typically transport under 500 vehicles every day, but they are nevertheless essential for moving people and products around Pennington County. When major enhancements are planned, they should have recoverable 4:1 inslopes and may have narrow shoulders (two feet) if daily traffic volumes are less than 400 vehicles per day.

Conversion of roadway from Gravel to Paved

Over time, components of the transportation system including bridges and pavements deteriorate. Replacement eventually proves to be the most economical course of action, even with proactive preservation over the course of the transportation system. To maintain the safe and effective flow of people and commodities, standards and practices also evolve, which has an impact on system operation and safety. When a component of the transportation system becomes structurally or operationally outdated, the County will replace it when it becomes a priority and once funding is available.

The number of vehicles on the road and the weight of the vehicles using it are among the factors that contribute to the deterioration of the life of a road. The ADT used to justify paving generally is in the range of 200 vehicles to 250 vehicles. When traffic volumes reach this range, serious consideration should be given to upgrade the roadway surface from gravel to paved. Traffic volumes are merely guides. Types of traffic and available funding should also be considered. Different types of traffic result in different demands on roads. Overloaded trucks are most damaging to both gravel and paved roads.

The functional classification of the highway should also be considered. If the roadway is a collector or arterial road, it should be paved. A local road may be sealed or paved while the road with heavy truck usage may be surfaced with gravel and left unpaved until sufficient funds are available to place a thick load-bearing pavement on the road.

Currently, the County has 504.7 miles of gravel roads, or 57.7% of the total county route system. The County will keep focusing its resources on paving gravel routes that are rated as collectors or larger and handle more than 250 cars per day to improve mobility, safety, and maintenance effectiveness.

The County will take other criteria into account in addition to ADT when considering the need for paving. These include:

- A road section that is either urban or rural.
- Located inside the Municipal Urban Service Area (MUSA).
- Typical ease and speed of travel.
- Safety and mobility.
- Maintenance efficiency.
- Funding availability.
- Coordination with partnering agencies.
- Bridge needs; and
- Environmental impacts.

CROSS SECTION STANDARDS

Pennington County Ordinance Number 14's standards and requirements must be met for the cross-section design to be approved as a County Road. The road will also adhere to additional jurisdictional rules and requirements if they apply, such as the County Subdivision Ordinance or if it is located within a municipality's extraterritorial zone.

Additionally, road design standards will be based on the current editions of the following references:

- American Association of State highway Transportation Officials (AASHTO), and
- SDDOT's Standard Specifications for Roads and Bridges.

SDDOT references often derive their recommendations and design standards from older editions of AASHTO. References are often updated with new editions, and new editions should be used when designing new roads. If new roads are being built or existing roads are being renovated, the current planning standards and recommendations as discussed below should be used:

- The design of the major arterial roads must have a right-of-way (ROW) width of 100 feet or more. This is necessary to accommodate all the objects in the cross section designed.
- Lane width of 12 ft is standard, especially for new construction, however 10 ft lanes may be considered for roads, including truck roads, where traffic capacity requirements is not a top priority, especially in the presence of paved shoulders and rumble strips.
- The crown rates for paved and gravel surfaces should be 0.02 ft/ft to 0.04 ft/ft. The maximum super elevation rate will be 0.06 ft/ft on paved surfaces and 0.08 ft/ft on gravel surfaces.
- Written approval from the County Highway Superintendent or their representative will be required for any road or segment of a road to have a grade exceeding twelve percent (12%).
- The maximum slope allowed is 4 to 1, with a preferred back slope of 3 to 1. The back slope should never exceed 1 to 1 under any circumstances.
- Roads that exceed 250 ADT should be paved.

Table 19 presents the typical cross-section standards for roadways in Pennington County. Figure 63 through Figure 69 on the following pages, shows minimum cross section standards for the county roadway classification plan.

Table 19 - County Roads Typical Cross Sections

Road Classification ->	Major Arterial		Minor Arterial		Collector			Local		
Type ->	Rural	Urban	Rural	Urban	Rural ^A	Rural ^B	Urban	Rural ^A	Rural ^{B,C}	Urban
Surface Material	Paved	Paved	Gravel	Paved	Gravel	Paved	Paved	Gravel	Paved	Paved
Surface Width (feet)	48	48	32	42	24	24	32	24	24	32
Lane Width (feet) ^D	12	12	12	12	12	14	12	12	12	12
Shoulder Material	Gravel	Paved	Gravel	Paved	Gravel	Paved	Paved	Gravel	Paved	Paved
Min Shoulder Width (feet)	2	4	2	4	2	2	4	2	2	4
Crown Rate	2%	2%	4%	2%	4%	2%	2%	4%	2%	2%
Max Super Elevation	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
In-Slope	4 to 1	-	4 to 1	-	4 to 1	4 to 1	-	4 to 1	4 to 1	-
Back Slope	3 to 1	-	3 to 1	-	3 to 1	3 to 1	-	3 to 1	3 to 1	-
Walk Width (feet)	-	6	-	6	-	-	6	-	-	6
Shared Use path (feet)	-	10	-	10	-	-	-	-	-	-
Minimum ROW (feet)	100	100	80	80	66	66	66	66	66	66

A - < 250 ADT; B - >250 ADT; C - Consider 6' On-Street Parking; D - Minimum 10 feet

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Figure 63 - County Roads Typical Cross Sections: Collector and Local (Rural, greater than 250 ADT)

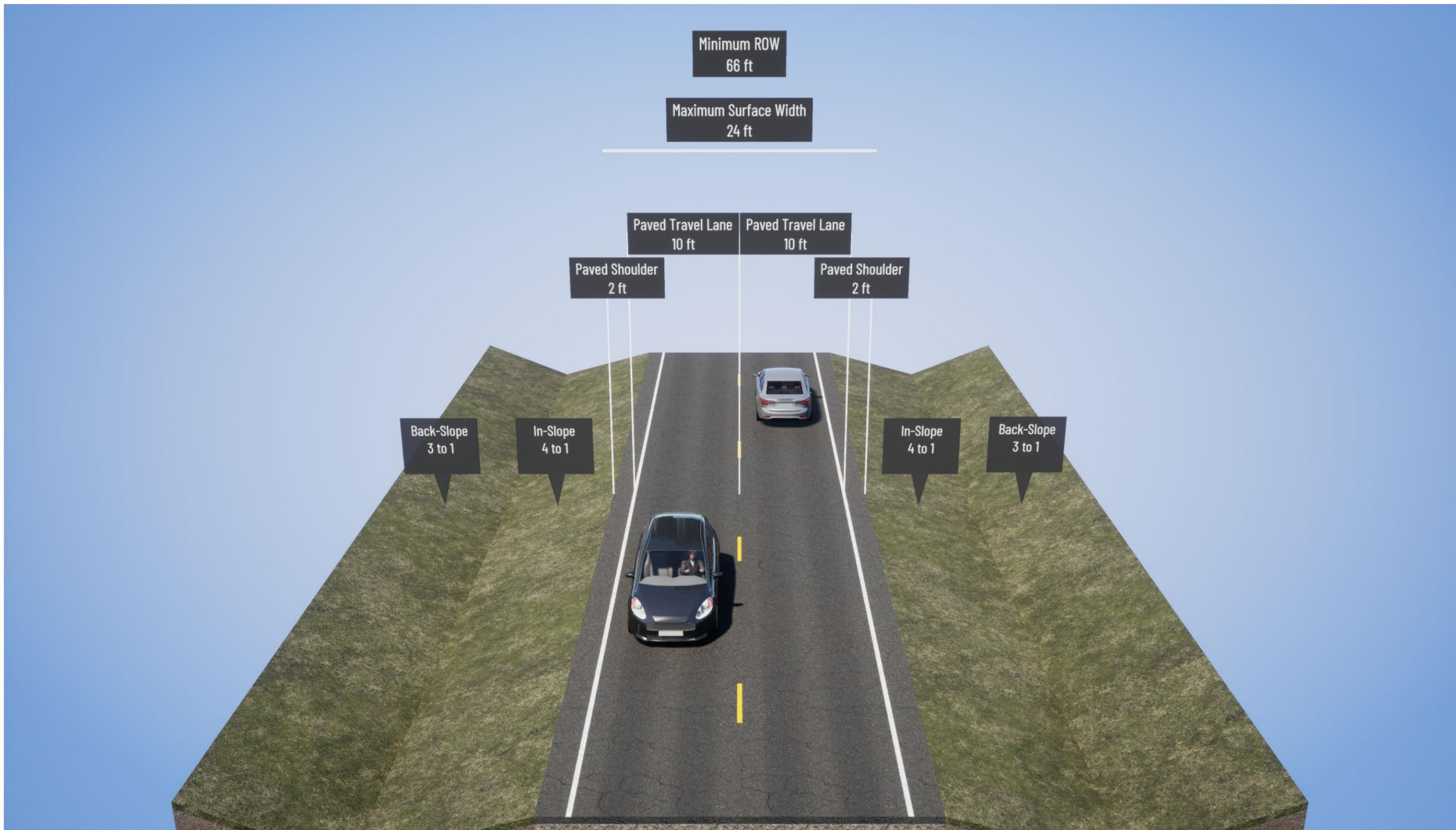


Figure 64- County Roads Typical Cross Sections: Collector and Local (Rural, less than 250 ADT)

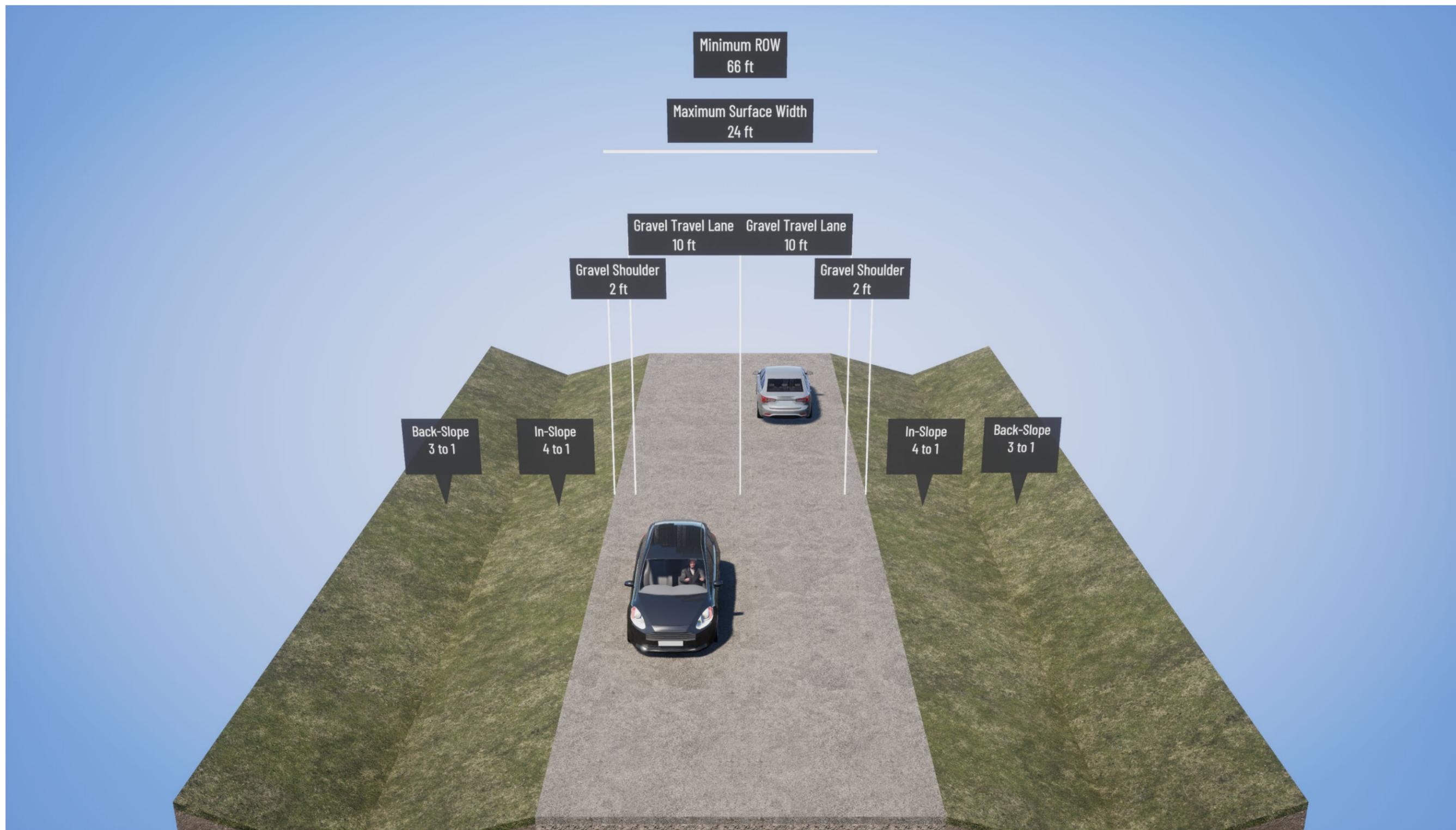


Figure 65 - County Roads Typical Cross Sections: Collector and Local (Urban)

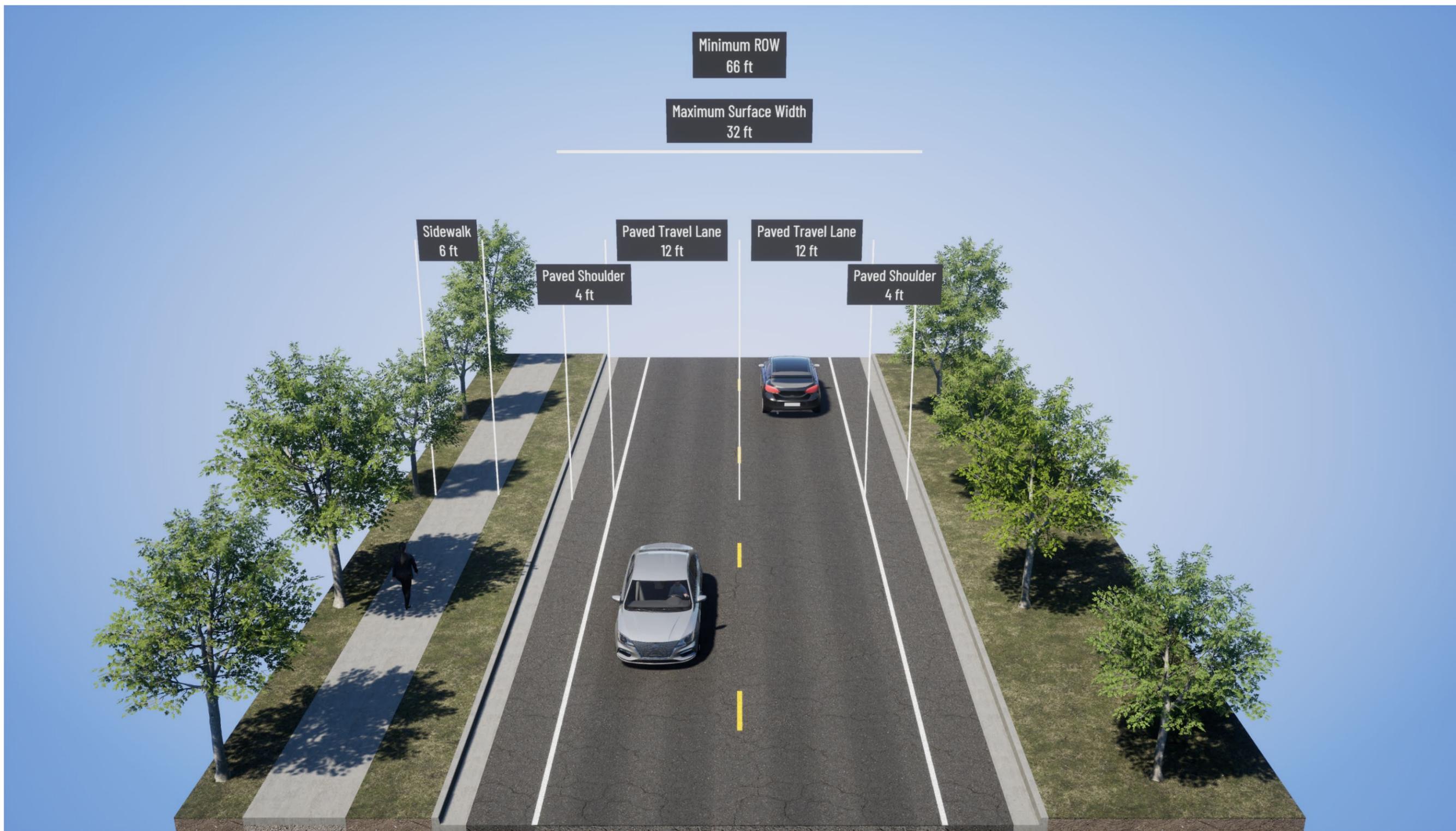


Figure 66 - County Roads Typical Cross Sections: Major Arterial (Rural)

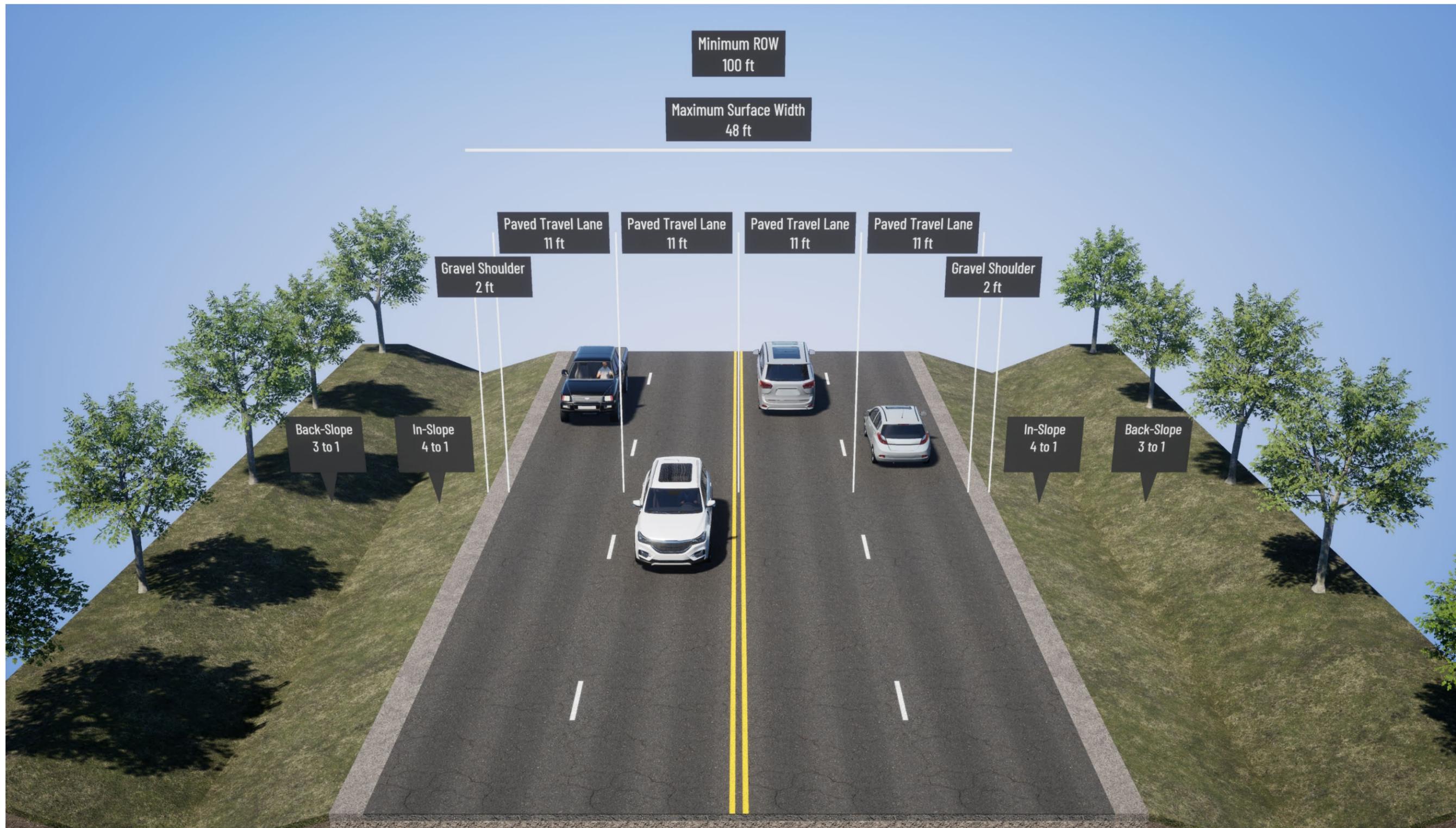


Figure 67 - County Roads Typical Cross Sections: Major Arterial (Urban)

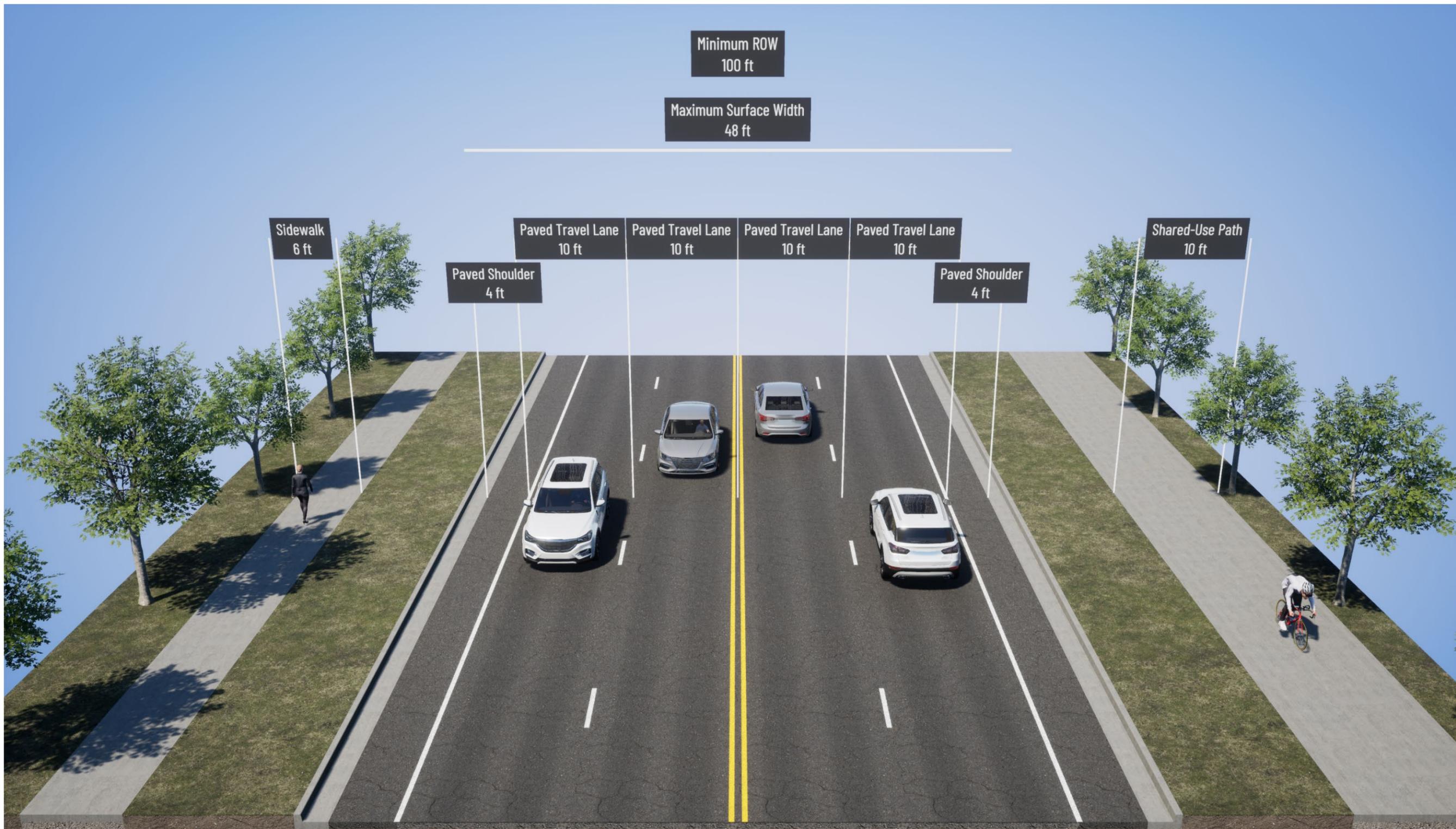


Figure 68 - County Roads Typical Cross Sections: Minor Arterial (Rural)

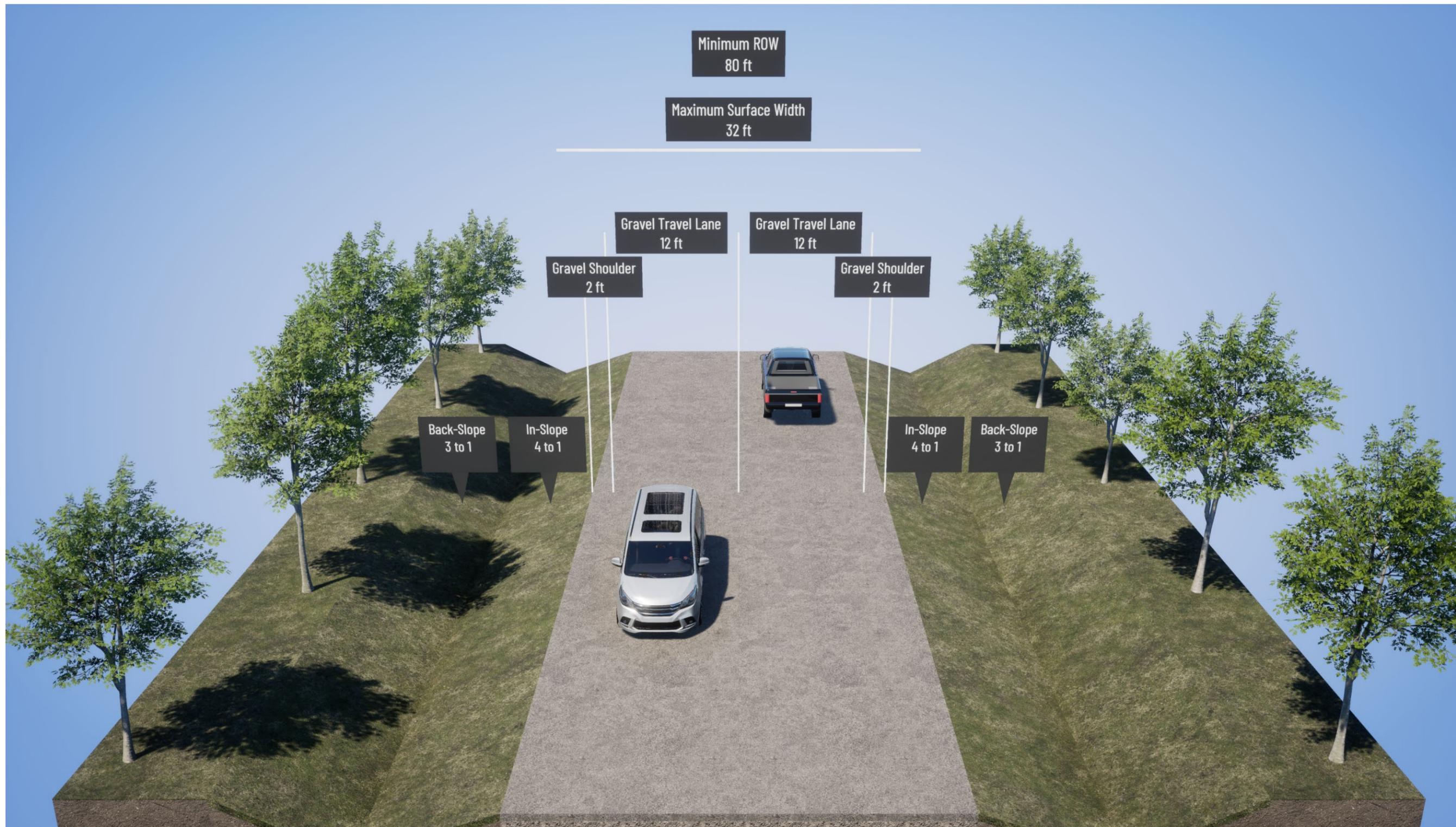
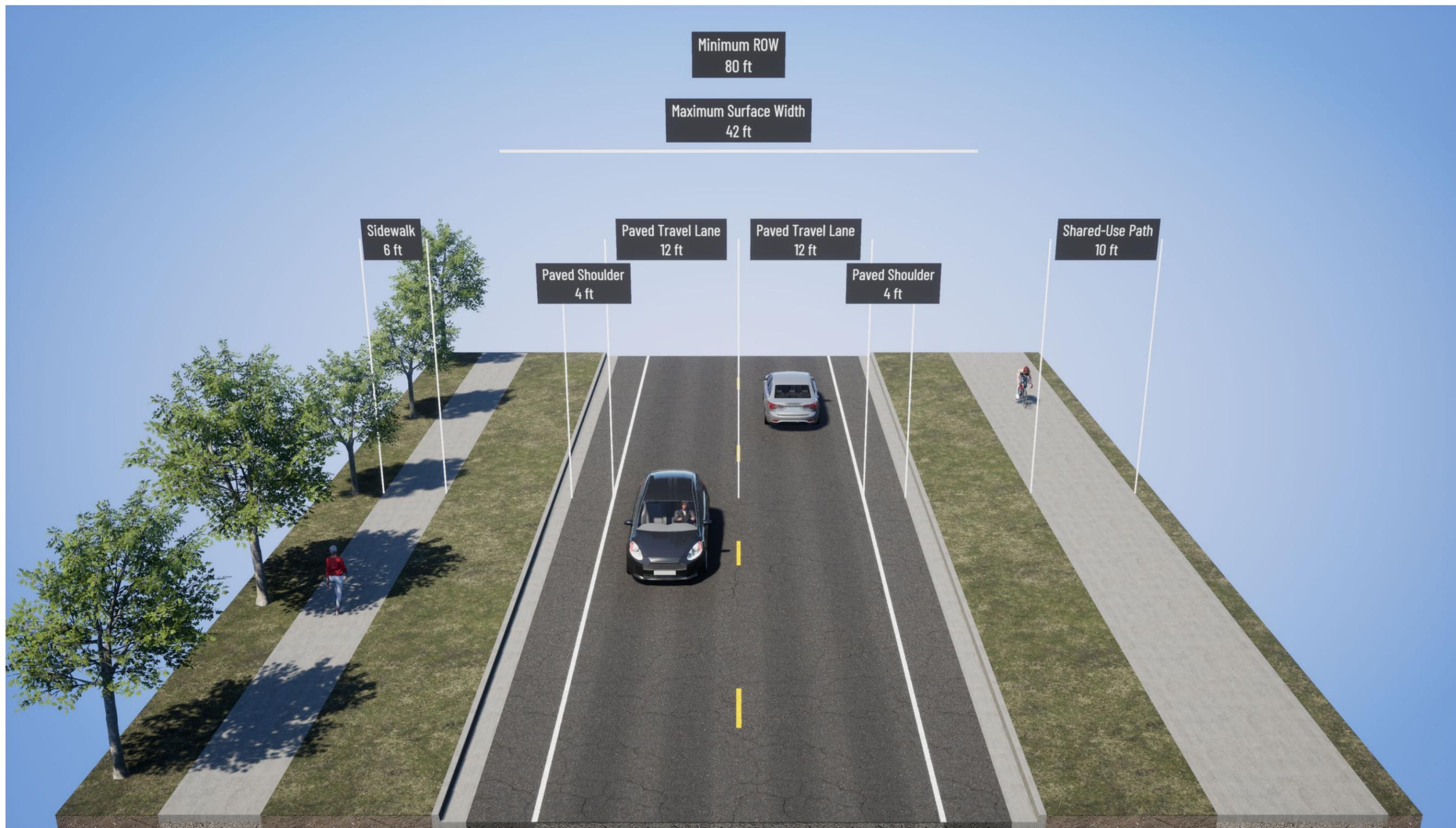


Figure 69 - County Roads Typical Cross Sections: Minor Arterial (Urban)



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ROADWAY PLANNING LEVEL CAPACITY

The daily capacities employed in the analysis (as presented in **Table 20**) are derived from information sourced from the Florida Department of Transportation (FDOT) pertaining to urban areas. FDOT's approach aligns with the principles outlined in the Highway Capacity Manual and offers planning-level approximations for daily capacities on arterials and freeways. These capacities are structured to offer overarching daily volume estimates and are also the standards used by Rapid City MPO.

Table 20 - Planning Level Roadway Capacity in Pennington County

Facility Type	Cross-Section	LOS E/F Daily Capacity
Arterial	2-Lane	12,744
	2-Lane + TWLTL in Center	15,930
	4-Lane	26,865
	4-Lane + TWLTL in Center	35,820
Collector/Local	2-Lane	9,600
	2-Lane + TWLTL in Center	12,000
	4-Lane	20,237
	4-Lane + TWLTL in Center	26,983

Source: 2012 Florida Department of Transportation Quality/Level of Service Handbook

LEVEL OF SERVICE STANDARDS

Considering the ongoing growth in Pennington County there is a pressing need to address the rising demand for transportation while simultaneously preserving the capacity of County roadways. The following section outlines the criteria for evaluating the Level of Service (LOS) standards, which play a crucial role in assessing the current and future performance of our transportation infrastructure.

Traffic operations are described in terms of level of service (LOS), based on the methodologies described in the Highway Capacity Manual (HCM). Level of service (LOS) is a qualitative measure developed by the transportation profession to quantify traffic operations by incorporating traffic volumes, roadway geometry, and other parameters to estimate the delay per vehicle. LOS at intersections provides a means for identifying intersections that are experiencing operational difficulties, as well as providing a scale to compare intersections with each other. The scale is based on the ability of an intersection or street segment to accommodate the amount of traffic using it. The LOS scale ranges from "A" to "F". LOS A indicates near free-flow traffic conditions with little delay and LOS F indicates breakdown of traffic flow with very high amounts of delay.

In summary, the level of service for intersections is a valuable tool for transportation professionals to evaluate and manage traffic operations. By assessing and improving LOS, cities and transportation agencies can enhance traffic flow, reduce congestion, and improve the overall quality of transportation networks while ensuring safety for all road users.

LOS for Roadways

A capacity deficiency exists when actual traffic exceeds the vehicular capacity of the highway. The acceptable capacity of a highway is influenced by numerous factors, encompassing location, route options, roadway geometrics, the positioning of major intersections, access management, peak-hour traffic volumes, and traffic control measures. Each segment of the highway possesses a finite capacity,

representing the maximum number of vehicles it can accommodate across all its lanes. For planning purposes, the level of service for a roadway link is determined by comparing the link's traffic volume to its roadway capacity. For a more comprehensive understanding of the level of service (LOS), please refer to **Table 21** for additional clarification.

Table 21 - Level of Service Definitions for Roadways

LOS	Traffic Flow	Vehicle/Capacity Ratio
A	Free Flow (Below Capacity)	0.20
B	Stable Flow (Below Capacity)	0.40
C	Stable Flow (Below Capacity)	0.60
D	Restricted Flow (Near Capacity)	0.85
E	Unstable Flow (Approaching Capacity)	1.00
F	Forced Flow (Over Capacity)	>1.00

It should be noted that while this methodology is appropriate for a planning-level, regional analysis, several factors such as signal density, freeway merging/diverging, and unique temporal traffic patterns are not well-captured with this methodology. Values are used as a guideline and should not be used for operational analysis purposes or final design.

In most scenarios within Pennington County, traffic analysis will predominantly focus on rural two-lane highways and intersections. The prevailing practice in the region is to maintain a level of service B for the rural roadway system and a level of service C for urban highways and intersection operations. Consequently, the recommended minimum acceptable LOS for existing or future conditions on Pennington County roads stands at LOS B for rural two-lane highways and LOS C for urban two-lane highways and intersections. These selected LOS standards align with the guidelines set forth in the SDDOT's Road Design Manual.

LOS for Intersections

Although the planning-level capacity can provide a good barometer of corridor operations, intersection operations often provide a clearer indication of corridor operations. Level of Service (LOS) for intersections is a crucial metric used in transportation planning and engineering to evaluate the operational performance and efficiency of road intersections. Intersections are key points where two or more roadways intersect, and they play a pivotal role in traffic flow and safety. Assessing the level of service helps transportation professionals understand how well an intersection is functioning and whether it meets the needs of road users.

At oversaturated intersections and approaches, the delay may only reflect the vehicles that can be processed in the analysis period and not the total delay for that intersection, thus underreporting the actual delay experienced by drivers. LOS C or better is generally desirable, and LOS D may be appropriate for urbanized areas in many agencies in South Dakota. Additionally, each approach to the intersection should be designed to have the highest LOS practical. The LOS thresholds for intersection delay are shown in **Table 22**.

Table 22 - Intersection Delay and Level of Service Thresholds

Level of Service	Average Delay (Seconds per Vehicle)		Description
	Unsignalized Intersection	Signalized Intersection	
A	≤ 10	≤ 10	Near free-flow traffic.
B	> 10 and ≤ 15	> 10 and ≤ 20	Minor delays.
C	> 15 and ≤ 25	> 20 and ≤ 35	Some delays, but not resulting in significant traffic congestion.
D	> 25 and ≤ 35	> 35 and ≤ 55	Delays with some traffic congestion.
E	> 35 and ≤ 50	> 55 and ≤ 80	Significant delays with significant traffic congestion, approaching capacity.
F	> 50	> 80	Breakdown of traffic flow, major traffic congestion.

LOS for Signalized Intersections

For signalized intersections, the LOS is based on the average stopped delay per vehicle. The procedures used to evaluate signalized intersections use detailed information on geometry, lane use, signal timing, peak hour volumes, arrival types and other parameters. This information is then used to calculate delays and determine the capacity of each intersection.

*LOS for Unsignalized Intersections*Side-Street Stop Controlled Intersection

Overall intersection LOS is undefined for side-street stop-controlled intersections within the HCM. The LOS for the side-street stop-controlled intersections in the analysis is based on the delay experienced by couple of movements within the intersection, rather than on the overall stopped delay per vehicle at the intersection. This difference from the method used for signalized intersections is necessary since the operating characteristics of side-street stop-controlled intersections are substantially different. Driver expectation and perceptions are entirely different. For side-street stop-controlled intersections the through traffic on the major (uncontrolled) street experiences minimal to no significant delay at the intersection. Conversely, vehicles turning left and going across the major street from the minor street, or vehicles turning left from major street to minor street experience more delay than other movements and at times can experience significant delay. Vehicles on the minor street which are turning right from the minor street experience less delay than those turning left or going across from the same approach. Due to this situation, the LOS assigned to a side-street stop-controlled intersection is based on the average delay per vehicle for vehicles for the minor street approach and left turn major street approach.

All-way Stop Control and/or Roundabout.

LOS for all-way stop controlled and or roundabout intersections are also based on delay experienced by the vehicles at the intersection. Since there is no major street, the highest delay could be experienced by any of the approaching streets.

LOS for Pedestrian and Bicyclists

Traffic analysis should incorporate multimodal assessments, as the most recent edition of the Highway Capacity Manual provides methodologies for evaluating bicycle and pedestrian LOS.

- Ord 14, LOS – any road that is paved will receive full maintenance.
- Gravel roads, based on area population, receive scaled back maintenance plans/program.

ACCESS MANAGEMENT GUIDELINES

Effective management of access points plays a crucial role in establishing a safe and efficient road network. This encompasses regulating entry and exit points on roadways, including the spacing of intersections and placement of driveways. Such control measures are pivotal for preserving or enhancing the smooth operation of the road system and, importantly, for bolstering safety by minimizing the risk of crashes.

Access control guidelines serve multiple purposes, chiefly safeguarding the public's investment in the road infrastructure and providing developers with clear directives for project planning. These guidelines are designed to strike a balance between the broader public interest in unhindered mobility and property owners' rights to access their properties. Access, in this context, pertains to ensuring convenient entry and exit points along roadways, which are essential at both ends of a journey. Mobility, on the other hand, refers to the ability to move freely and easily between locations. Most roadways fulfill both these functions to varying degrees, contingent upon their functional classification.

Efficient management of driveway access throughout the entire road network necessitates coordinated efforts among City, County, and State authorities.

In Pennington County, Access Spacing and Access Configuration Guidelines have been formulated to offer direction in making determinations regarding the type and placement of access points across the County's road system. These guidelines are typically employed in situations involving safety or operational concerns, evaluations of access during permit issuance or plat review processes, and in conjunction with planning studies and improvement initiatives.

The overarching goal of these Access Guidelines is to ensure that the county's roadways contribute to a transportation system that minimizes safety hazards while optimizing overall efficiency. Further details regarding the standard specifications for county approaches can be found in Pennington County's Ordinance No. 14. Along state highways, SDDOT access standards apply which is authorized by the 2002 South Dakota Legislature to create administrative rules relevant to highway design functions. **Table 23** summarizes the proposed access spacing standards for Pennington County, including direction for signal spacing, intersection spacing, driveway access density, and direct property access.

Table 23 - Pennington County Access Spacing Guidelines

Class	Sub Class	Cross Street (feet)	Signal (mile)	Access Density (per mile)	Direct Access
Arterial	Rural	1,000	1/4	5	Exception only
	Urban	2,640 F 1,320 D	1/2	4	Exception only
Collector	Rural	1,000	1/4	5	Yes
	Urban	1,320	1/4	5	Yes
Local	Local	Not applicable			

F – Full Movement; D – Directional Only

The access spacing for private access points is based on Stopping Sight Distance. Stopping sight distance is defined as the minimum distance needed by motorists to see an object on the roadway ahead and bring their vehicles to safe stop before colliding with the object. **Table 24** below is the minimum spacing for unsignalized private access points. Note that this table is based on a level roadway without any horizontal and vertical curvature. In areas with vertical and horizontal curves, additional distance may be needed.

Table 24 - Minimum spacing for unsignalized private access points

Speed Limit (mph)	Minimum Separation (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

Source: AASHTO Green Book, 2004

Access management guidelines and practices should generally be implemented at the county and local levels (cities and townships with active land use planning programs) as these agencies are typically involved at the planning stages of development proposals. However, effective access management requires mutual support and effective communication at all governmental levels. Therefore, it is important to consider how access management guidelines are implemented as part of county planning and development review procedures.

INTERSECTION CONTROL WARRANTS

The evaluation of intersection control in this report adheres to the principles outlined in the Manual of Uniform Traffic Control Devices (MUTCD), which is a comprehensive guide that governs the design and usage of traffic control devices on roads and highways. In accordance with the MUTCD, the following guidelines are employed for assessing and determining appropriate intersection control measures, with additional insights available in the 2009 Edition of the MUTCD.

An engineering study should be conducted to identify appropriate traffic control measures. The study incorporates factors to consider in the establishment of intersection control and includes:

- Vehicular, bicycle, and pedestrian traffic volumes on all approaches
- Number and angle of approaches
- Approach speeds
- Sight distance available on each approach
- Reported crash experience

Conditions have been established in the MUTCD to provide guidance on the use or consideration of YIELD and STOP signs. These conditions are specific to application and are based on the aforementioned factors when evaluating the establishment of intersection control.

In locations where dynamic means of traffic control may be desired, the following traffic signal warrants are analyzed to help in the analysis of whether to install a traffic signal.

- Warrant 1: Eight-Hour Vehicular Volume
- Warrant 2: Four-Hour Vehicular Volume
- Warrant 3: Peak Hour
- Warrant 4: Pedestrian Volume
- Warrant 5: School Crossing
- Warrant 6: Coordinated Signal System
- Warrant 7: Crash Experience
- Warrant 8: Roadway Network
- Warrant 9: Intersection Near a Grade Crossing

It should be noted that the MUTCD 2009 Edition states, “The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal”. Further information on the individual warrant definitions, traffic control signal needs studies, the standard, guidance, and options are provided in the latest edition of the MUTCD.

NEED FOR TURN LANES

It is generally beneficial to install turn lanes at intersections to improve traffic operations and safety, and especially along highway segments with high traffic volumes or high volumes of turning vehicles. Turn lanes contribute to safer, more efficient intersections by separating turning and through traffic, reducing conflicts, and minimizing delays. This results in an overall improvement in the performance and safety of the transportation system.

Chapter 15 of the SDDOT Road Design Manual provides comprehensive guidance on factors to be taken into consideration when implementing left- and right-turn lanes at intersections. These considerations are pertinent across various types of roadway or driveway intersections and are designed to align seamlessly with established access management policies and County ordinances.

The following items are recommended for consideration in the determination of whether a turn lane is warranted:

- Traffic Volume during design hour
 - Turn Volume
 - Opposing and Advancing Volume
- Crash History
- Special Cases such as:
 - Railroad Crossings
 - Safety Concerns
 - Presence of Non-transferable medians (for left turns)

At signalized intersections, it is typically advantageous to install a left-turn lane in terms of traffic operations and safety, while a right-turn lane is generally determined based on signal capacity needs or operational/safety improvements by removing turning vehicles from the through lane.

The process for application and assessment of turn-lane warrant criteria is outlined in detail within Chapter 15 of the SDDOT Road Design Manual. While SDDOT's Road Design Manual should be used as a guide, the Pennington County Highway Department will take into consideration the context of each situation which includes existing and proposed conditions as well as other factors such as heavy-truck use, proximity to railroad crossings, bridges, percent trucks during peak hour operations, and other factors.

Turn lanes should be at least 12-feet wide plus a minimum shoulder width depending on adjacent roadways, bike use, and other factors. Right-turn lanes constructed with no center or left turn should be constructed with a minimum of 6-feet additional width to accommodate a future need for a center turn lane.

TRAFFIC IMPACT STUDY GUIDELINES

A Traffic Impact Study (TIS) is a tool used to manage roadway access and objectively evaluate anticipated safety and operational impacts of proposed development on the surrounding transportation system. The primary responsibility for assessing the traffic impacts associated with a proposed development rest with the developer, with Pennington County Highway Department serving in a review and approval capacity.

General

A TIS could be required for any type of development and associated trips being generated to objectively assess the safety and operational impacts of the development or modified land use on the Pennington County Roadway System. These impacts are typically due to generation of new traffic volumes or shifts in travel patterns. However, the general rule, unless waived by the Pennington County Highway Department, should be that a TIS will be required for:

- Any nonresidential development proposal when trip generation during the peak hour is expected to exceed one hundred (100) vehicles, or
- Any residential development with one hundred fifty (150) or more dwelling units.
- Any development that may result in traffic issues in the opinion of the County Highway Superintendent.

If the development does not meet the above trip generation requirements, the developer should be required to submit a short memo to the County Highway Superintendent documenting why a TIS is not required or that the County Highway Superintendent has waived the requirements for a TIS.

When a TIS is required, it is recommended that the developer is responsible for assessing the traffic impacts, prepared, and signed by a registered professional engineer, and licensed in the state of South Dakota. The County should serve in a review and approval capacity. Traffic impact study approvals granted by the County shall be valid for up to two years. If significant work on the development has not commenced within the approval period, the TIS shall be updated and resubmitted for review. Unless waived by the County Highway Superintendent, studies will be required to be updated within the two-year approval period if the proposed land use(s) are significantly altered, or traffic volumes within the study area are increased by more than 15%.

Prior to starting the study, the developer or the engineer preparing the study is strongly encouraged to schedule a pre-study conference with the County Highway Department. If there are any other potential jurisdiction authorities within the study area, they should also be included in the pre-study conference to determine if there will be additional review agencies and requirements as part of the study. The purpose of pre-study conference is to discuss the development, definition of the study area, intersections requiring capacity analysis, data collection needs, design standards, traffic and trip analysis parameters, and other methods, requirements, and assumptions. Following the pre-study conference, the developer or the engineer preparing the study shall detail the agreed upon assumptions and requirements in the report.

The boundaries of the TIS should include any roadway on the County roadway system that is impacted or receives an impact that lowers the level of service (LOS) below "C" or causes operational deficiencies. This might include intersections with other County highways, intersections with public streets, or adjacent driveways. The TIS will be reviewed by the Pennington County highway staff. The review will ensure that the study is acceptable and that all mitigation measures meet Pennington County standards.

Report Format and Contents

Specific requirements will vary depending on location of the proposed development and other factors. At the pre-study conference, reductions in complexity or variations from the SDDOT Road Design Manual shall be agreed upon by Pennington County Highway Department. However, all traffic reports shall contain, as a minimum, the following information:

- Introduction
 - Background
 - Location of the proposed project
 - Description of the site
 - Objective of the study
- Study Area
 - Map showing existing and future study roadways and intersections.
 - Lane configurations of the existing and future study roadways and intersections.
 - Site plan including all existing and proposed access points to the County highway system.
 - Internal circulation network including any proposed construction phasing.
 - Discussion of any non-motorized transportation facilities provided at the site.

- Traffic Data
 - Traffic count locations, design hour counts, and type of counts
 - Traffic counts must be collected on Tuesday, Wednesday, or Thursday under non-adverse weather or road conditions.
 - Traffic counts may need to be collected on weekends if proposed traffic generated by the development are expected to be high on weekends.
 - Review of most recent five years of crash records in the study area
 - Other relevant data that may seem required by the County Superintendent
- Study/Analysis Years
 - Build-out year - The year when the construction of the site will be completed and fully operational.
 - 20-year horizon year.
 - Interim-year analysis year if the construction will be built in multiple phases.
 - Analysis should be completed for the design hours (AM and PM peak) for No-Build and Build scenarios.
 - *No-Build* scenario refers to the conditions without the proposed development scenario. This option includes no geometric improvements at the proposed site accesses, and the existing traffic counts projected to the facilities opening year traffic volumes.
 - *Build Scenario* refers to the conditions of the proposed development scenario. This option pertains to geometric improvements, if any, combined projected background and development traffic.
- Trip Generation and Distribution
 - Description of the proposed Land Uses
 - Calculate trips generated based on the land use characteristics found in the most recent edition of the Institute of Transportation Engineer (ITE) Trip Generation Manual or any other relevant studies.
 - Trip Distribution based on prevailing travel patterns, and engineering judgement.
- Traffic Volume
 - Traffic forecast method.
 - Forecasted Pre-development background traffic volumes.
 - Forecasted post development background traffic volumes.
- Traffic Operations Analysis for design hours
 - Mention of the traffic analysis software package used (ex. Highway Capacity Software, Synchro, VISSIM, etc.) that uses the methodologies documented in the most recent version of the *Highway Capacity Manual*.
 - Delay and Level of Service (LOS) of the existing and proposed study intersections
 - 95th percentile queueing analysis
 - Consideration for heavy vehicles, peak hour factor (PHF), saturation flow rate (use 1750), and other variables

- Warrant Analysis should be completed for No-Build and Build scenarios for the Build-out year
 - Traffic Signal and/or multi-way-stop-control warrant analysis of unsignalized intersections
 - Turn-lane warrant analysis
 - Access spacing of the proposed accesses from the nearest crossing roadways
- Discussion of the results.
- Identify issues by comparing the impacted facility with and without the development.
- Mitigation measures if the traffic operational and safety issues are caused by the proposed development.
- Conclusions and Recommendations.

Appendices

All reports should include the following appendices, at minimum:

- Summarized hourly traffic counts.
- Traffic Capacity Analysis output reports showing delay per vehicle, level of service, and 95th-percentile queues.
- Worksheets used in the analysis.

TRANSPORTATION POLICY AND ORDINANCE RECOMMENDATIONS

The following are recommendations for departmental policies, ordinances, or office procedures that may help to implement the goals and objectives of the MTP and other County plans.

Engineering Study:

- Define “Engineering Study” in the County code. This would provide an explanation why a study is necessary and who is qualified to do the studies.
- Develop a checklist that provides criteria for what is to be included in the study.
- Various items may be waived if certain circumstances are met.
- The circumstances should be listed so that there is some guidance for policy makers to grant waivers in a consistent and justifiable manner.

UTV/ATV:

- KIJ recommends consideration of writing a new ordinance to regulate UTV/ATC traffic. A draft sample ordinance is included in Appendix B, which details components gleaned from Ouray and Montrose Counties in Colorado. These two counties have a similar environment and share the concern about the impact these vehicles have on the condition and traffic on county roads.
- Coordinate with law enforcement, municipalities, and federal agencies, in the drafting of ordinances, policies and the allocation of resources.

Buffering and Mitigation of Impacts:

- Consider identifying areas where regulations, techniques or installation of structures may be needed to mitigate noise, dust, and light that may be offensive to residents. Particular attention should be given to intensive commercial, manufacturing, or industrial properties.

Bicycle/Pedestrian

- Identify areas of the county that may be developed with higher density residential developments and that may have pedestrian and non-motorized transportation needs.
- Consider codifying the standards and recommendations that are stated in this plan and the comprehensive plan.
- Coordinate with the school districts on potential stops and routes as they may provide an indication of potential areas where children will travel on foot and on bicycles.

Traffic Impact Studies:

- Define Traffic Impact Study in the county code.
- Codify when a Traffic Impact Study is to be required. Establish a criterion and the ability to waive certain elements for unique circumstances (see pages 114, 132, 133). The waiver process should be like the variance process, whereas applicants must justify the reasons why a study is not necessary. The ordinance may provide for a condensed study requirement, or a temporary waiver that includes conditions when the study will be required in the future, an example is a project developed in phases.
- Establish a listing of consultants who are qualified to prepare the studies.
- Require the developer/applicant to pay for the traffic impact study.
- Include Traffic Impact Studies as project costs for Tax Incremental Financing Districts.

Access Management:

- Develop a county access management strategy or policy.
- The SDDOT has sample language on their forms, and documents to be used as guidance.
- Collaborate and coordinate with other entities when county roads intersect with other public roads and jurisdictions.
- The county should consider purchasing access rights in key areas to prevent unauthorized access. This is in addition to requiring driveway permits.
- Incorporate in the nuisance ordinance, controls and abatements of obstructions and encroachments in county roadways that impede maintenance and traffic. Enforcement action may be required for those who consistently have items too close and are uncooperative. (Mailboxes, signs, landscaping features)
- Develop and codify minimum standards for private roads to insure access for prompt emergency response, maintenance, snow removal, wildlife migration, and adequate pedestrian traffic (if applicable).

Dead End Roads and Emergency Response:

- Develop a procedure or policy in coordination with emergency response departments to discourage 'dead end roads' in new subdivisions.
- During the pre-conference process inform the developer they must demonstrate why the proposed road placement is the most efficient and feasible.
- Installation of a secondary or temporary access for emergency response may be required when a subdivision is being developed in phases and roads are being installed incrementally.
- Temporary access roads for emergency response may be required.
- Encourage alignment to future roads indicated on the county's road plan, or with adjoining subdivisions that have future roads planned.

Right to Farm Covenants:

- The county may want to consider requiring covenants in areas where development and agricultural activities may have land use conflicts. Ag activities have specific needs and have specialized vehicles that will be on county roads.
- Covenants may provide notice to prospective buyers that there will be traffic for agricultural vehicles that will be entering and leaving ag land, farms, and ranches, and to the markets.

Joint Jurisdictional Ordinances:

Consider joint-jurisdictional plans and/or ordinances for areas that are adjacent to municipalities but may not be suitable for immediate annexation, but developable under county regulations. Targeting the transitional areas will be for the mutually beneficial and will result in the following:

- Codifying the alignment of the streets and roads to assure connectivity between jurisdictions and other transportation infrastructure.
- Provide consistent standards for roadways in the transition of municipal to county roads and vice versa. This may also be applicable for county roads to state highways and vice versa.
- Improve communication between the entities for future planning and budgeting.
- Provide notice to future landowners and developers in the transitional areas.
- Improve the efficiency for application review, processing, and approval.
- Improve consistency and compatibility with county and municipal plans.

Development Fees/Costs:

- Consider incentive or bonus zoning for best practices in designing desirable transportation systems/roads. This may include waiving fees, county providing and placing traffic control signs, and other benefits. The best practices may include access roads, sufficient ROW, pedestrian traffic alternatives, drainage, and other features that exceed standards.
- Periodically examine fees to ensure the recovery for the costs of reviewing applications, public notices, departmental expenses, and the fees are reasonable and sufficient.

County Website:

- The website is very navigable and continue to maintain the website with features that provide transparency and a venue for public comment. Continue to provide supporting documents that are user-friendly and visually appealing.

Comprehensive Plan:

- Continue to review and update the County Comprehensive Plan accordingly when new developments are proposed. Amend the plan when necessary.
- Continue to collaborate with the municipalities when they find it necessary to change their comprehensive plans, particularly in areas adjacent to the county's jurisdiction.
- Continue to monitor traffic patterns and installation of new transportation systems that will result in substantial development and amend the plan accordingly.

Comprehensive 2020 Transportation Goals and Objectives:

- Pursuit of grants and other funding sources. (Transportation Circulation (TC)-1.1)
- Coordination and partnerships with various entities in the County. (TC 1.4)
- Seek opportunities for new technologies. (TC 1.5)
- Explore and consider accommodating bicyclists. (TC 1.3,2.1, 2.2)
- Examine the viability of alternative transportation for visitors to the county. (TC 2.3)
- Collaborate with the municipalities for access and circulation to and from the airport. (TC 3.2)
- Resist changing signage regulations to prevent clutter and preserve the natural landscape, especially on designated county scenic routes. (TC 5.3, 5.4)
- Consider a wayfinding signage program. (TC 4.1, 4.2, 4.3)
- Consider policies to protect the views, historic sites, and natural environment. (TC 5.1, 5.2)

Development Guide:

- Maintain the Development Guide. This is an excellent tool and is very clear and concise. Update it periodically when ordinances or polices change.

GIS/Mapping:

- Continue to update the tools and features of the GIS and mapping systems of the county to provide additional data and depictions.

Rural Living:

- Consider producing and distributing a document that addresses rural living. It may contrast the typical county services provided versus typical municipal services. This may provide new residents to 'country living' expectations regarding transportation in rural Pennington County. These may include ordinances, policies, emergency response, snow removal, road surfaces, and access. The appendix includes a publication that other counties in South Dakota have provided their new residents.

CHAPTER 7 – ROADWAY (and Data) MANAGEMENT SYSTEM

Roadway Management Systems (RMS) play a pivotal role in the effective functioning of transportation agencies, serving as the backbone for planning, monitoring, and optimizing road networks. The integration of these systems not only enhances operational efficiency but also contributes to safer, more sustainable, and technologically advanced transportation networks. As the challenges of urbanization and population growth persist, the importance of RMS in shaping the future of transportation cannot be overstated. Agencies that prioritize the implementation and continuous improvement of RMS are better positioned to meet the dynamic demands of the ever-evolving transportation landscape.

As part of the Master Transportation Plan, a Roadway Management System comprising of comprehensive, customized spatial features and attributes were created in Geographic Information System (GIS) and excel spreadsheets to track infrastructure improvement projects. The RMS is expected to keep the County to track roadway surfacing and maintenance needs and identifies upcoming projects needed to keep County Roadways in acceptable condition.

DATA FRAMEWORK

To ensure the successful development of a data framework, it is essential to establish a comprehensive implementation plan. This plan should be collaboratively agreed upon, considering factors such as available resources, maintenance protocols, and cost considerations. Additionally, the plan should address two key considerations.

1. **Designation of Data Manager**

The data manager plays a crucial role in controlling access to the data and ensuring privacy, especially when handling sensitive or confidential information. Successful instances have shown that assigning a non-governmental organization as the data manager can yield positive outcomes.

2. **Defining the roles of different stakeholders serving as data sources.**

Agreements within the framework should outline who will provide the data, the required format, and the timeframe for data updates. These agreements enable the data framework to supply metadata information to historical data users, facilitating their identification of necessary sources and simplifying the download and utilization of data.

Once the data framework is designed and implemented, the advantages of data accessibility can be shared among various stakeholders. This ensures the provision of reliable and updated information for use in diverse transportation planning activities within the region.

PERFORMANCE MEASURES

A list of primary performance measures is developed to support the RMS. It is intended that these measures provide sufficient information to understand, evaluate, and plan for mitigating the transportation challenges such as highway capacity, safety, land use, population, etc.

The following data listed are among the information that was referred to obtain the desired performance measures, for different transportation-related analyses:

1. Land Use
2. Transportation Analysis Zone (TAZ)
3. Roadway Jurisdiction
4. Annual Average Daily Traffic (AADT)
5. Roadway Functional Classification
6. Roadway Speed
7. Roadway Surface Type
8. Roadway width
9. Right-of-way (ROW)
10. Crash Data
11. Pavement Condition Index
12. Bridge & Culvert Inventory

Development of a short-term and long-term major road plan for 2030 and 2045 includes the preferred location for future arterials and collectors within the County. Arterial and collector recommendations consider FHWA functional classification mileage percentages and recent development activity compiled in a GIS and Excel spreadsheet-based database and available to the Pennington County Data Manager.

POTENTIAL DATA SOURCES

This section lists the potential sources of data that may be available for use and developing performance measures of the roadway infrastructures.

1. SDGIS Data Hub

The South Dakota GIS Data Hub is the portal to South Dakota geospatial data and information. The infrastructure is comprised of geospatial data storage, data services, and application interfaces. The GIS Data Hub supports state agencies in the development of their GIS and the dissemination of common interest data to other levels of government and the public.

2. Rapid City MPO Travel Demand Model

The Rapid City Travel Demand Model (TDM) is a regional model that encompasses the major municipalities of Pennington County and Meade County. The Rapid City TDM is maintained by the Rapid City MPO. The information used to update the model, as well as the model's projections, may be a useful data source to obtain some of the desired performance measures. The TDM could benefit from the cooperation of multiple agencies involved with Congestion Management Process projects.

3. Highway Performance Monitoring System (HPMS)

The Highway Performance Monitoring System (HPMS) serves as a data repository overseen by the Federal Department of Transportation (DOT) to evaluate the effectiveness of the national highway system. This program, operating on a nationwide scale, compiles inventory details for all public road mileage within the country. State Governors annually certify this information, encompassing roads accessible to the public irrespective of ownership, ranging from Federal and State to county, city, and privately-owned roads like toll facilities. States are obligated to submit comprehensive data in adherence to the reporting guidelines outlined in the HPMS Field Manual.

Access to the HPMS is facilitated through the User Profile Access Control System (UPACS), providing entry to State Departments of Transportation (DOT) and Metropolitan Planning Offices (MPO). This ensures that relevant entities can securely retrieve and utilize the pertinent data stored within the HPMS for various transportation planning and analysis purposes.

4. National Bridge Inventory System (NBI)

The NBI System functions as a repository for data pertaining to bridge inspections and the expenses linked to the replacement of structurally deficient bridges both within and outside the National Highway System (NHS). This information is gathered in accordance with the regulations set forth by the National Bridge Inspection Standards (NBIS) as mandated by legislation. The NBI System plays a crucial role in evaluating eligibility for NHS projects, generating performance metrics reports, determining penalties related to the NHS, and fulfilling reporting obligations to Congress. Additionally, it contributes to the oversight of the NBIS by utilizing diverse reporting tools and furnishes data reports aligning with the strategic goals of the agency.

CHAPTER 8 – PROJECTS, PRIORITIZATION, AND PROGRAMMING

ROADWAYS, INTERSECTIONS, AND PEDESTRIAN/BICYCLE PROJECTS

Identifying areas of growth in the County was a key first step in the process of *new* project identification. A composite GIS analysis of the key identified urban and rural growth areas listed previously in **Table 2 - County Growth Areas: Urban and Rural (CHAPTER 3)**, the baseline conditions inventoried in **CHAPTER 3**, and traffic volumes, operations, and safety analysis from **CHAPTER 4**, provided the basis for the identification of *new* projects.

In addition to the identification of *new* projects, projects from the previous 2016 MTP (CHAPS), and the current Pennington County Transportation Department’s Five-Year Plan (2023-2027) were reviewed by KLJ with communication with County staff to verify each of the existing plans project’s current status and/or completion. From these existing and previously prioritized projects listings, any incomplete or “in-progress” projects were carried forward into this current MTP and prioritized as short-term projects and re-assigned a recommended completion year between 2024 and 2028.

Roadway and pavement projects are based on the following maintenance and construction costs for each type of road improvement, shown below in **Table 25**.

Table 25 - Roadway Improvement Costs Per Mile by Improvement Type

Improvement Type	Cost per Mile*
Complete Reconstruction	\$2,200,000
Reconstruction	\$2,000,000
Structural Overlay w/ Dig Outs	\$1,200,000
Structural Overlay	\$1,000,000
Non-Structural Overlay	\$600,000
Crack and Chip Seal	\$55,000
Chip Seal	\$46,000
Crack Seal	\$22,000

Table 26 below, provides a project source breakdown, summary, and totals for 2024 MTP Roadway, Intersection, and Pedestrian/Bicycle projects.

Table 26 – Projects Source Summary

Project Type	Project Source			Project Totals
	2016 Chaps – Carried Forward	5-Year Plan (2023-2027) Carried Forward	New Identified Projects (2024 MTP)	
Short Term (2024-2028)				
Roadway	4	16	8	28
Intersection	8	1	9	18
Ped/Bike	0	0	0	0
Total Short-Term Projects				46
Long Term (2029+)				
Roadway	4	0	17	21
Intersection	1	0	11	12
Ped/Bike	1	0	0	1
Total Long-Term Projects				34
2024 PENNINGTON COUNTY MASTER TRANSPORTATION PLAN (MTP): TOTAL ROAD, INTERSECTION, & PED/BIKE PROJECTS				80

For each project type, i.e., roadway, intersection, or bicycle/pedestrian project (excluding Bridge Projects) **Table 27** (short-term projects 2024-2028) and **Table 28** (long-term projects 2029+) provide the following details for each project type:

- Project source (e.g., 5-Year Plan, CHAPS, or New project generated from GIS and baseline conditions analysis)
- Road segments/project extents (“from” and “to”) - **for roadway projects only*
 - Miles of project roadway are quantified
 - Average Pavement Condition Index score is provided where data was available

- Intersection name - **for intersection projects only*
- Recommended improvements / Work type action
- Cost Estimation
- Project Time Frame (short term *or* long term)
- Completion Year: 2024-2028 (short term) *or* 2029+ (long-term)
- Project Rationale

Figure 70 provides a county wide geographic detail with a numbered project list of all short- and long-term Pennington County transportation projects (excluding bridge projects – Bridge programming is discussed in the following subsection of this Chapter). **Table 27** (short-term projects 2024-2028) and **Table 28** (long-term projects 2029+) provide prioritized project lists which corresponds with the numbered projects from **Figure 70**.

FREIGHT PROJECTS

Truck Freight Impacts to the County Road System

Freight future needs analysis assessed truck volumes on County roadways and evaluated key freight generators and origin/destinations such as the Transload facility and rail lines. Truck freight projects are captured in the short- and long-term roadway projects listed in **Tables 27 and 28** and **Figure 73** and are addressed as they pertain to roadway LOS, safety, volumes, and pavement maintenance and conditions.

TRANSIT PROJECTS

It is recommended that Pennington County support transit agencies whenever possible. This support could range from an annual allocation for transit funding for specific purposes within the County, to supporting their efforts in future grant applications. Future funding allocations could initially be provided to River Cities Transit (RCT), to help increase RCT's Federal matching grant amount. River Cities Transit is currently providing services and additional funding would help continue to serve the demand for transit in Eastern Pennington County and provide necessary services, particularly for the transit-dependent population in Pennington County.

Transit improvement issues and needs are ongoing and improvements and/or extensions of service are highly based on available funding. Known ongoing transit issues/needs include the following for RTS.

- Supplement the existing transit system to include night/weekend hours of operation and service to surrounding communities. Introduce evening service on a limited basis first to test
- Educate the entire community about available transit services
- Need to develop a collaborative approach among service providers
- Need more service between EAFB and Rapid City
- No budget for extending transit routes outside Rapid City limits
 - Not cost effective to run transit to airport at this time.
- Prairie Hills Transit provides some transit outside of Rapid City Limits
- Black Hills Works is an existing last-mile type transit service.

BRIDGE PROJECTS

Table 29 provides a detailed 8-year bridge Program Schedule for all bridges and culverts within Pennington County.

Table 27 – Short-Term Roadway, Intersection and Bike/Ped Projects

Project #	PROJECT SOURCE: 5-Yr. Co. Road # / CHAPS / NEW	GIS ID #	Road Segment	From	To	Miles	GIS Category (New Project)	Avg. PCI	Recommendation / Improvement (Work Type / Action)	Cost (Estimation)	Time Frame (Short Term = 2024-2028)	Completion Year	Rationale / Project Status
SHORT-TERM ROADWAYS													
1	CHAPS	130603, 130602, 130601	S. Rochford Rd	Rochford Rd*	Deerfield Rd	8.55			Pave Roadway 1 (2015)	\$20,000,000	Short Term	2024	Construction 2023-2024
2	5-Year 330701	330701	Slate Prairie Road	S. Rochford Rd	Deerfield Rd	6.03			Base Stabilization	\$3,618,000	Short Term	2026	
3	NEW	230901	Gillette Prairie Rd	Deerfield Rd	E Slate Rd	5.27	Gravel to Pave Candidate		Pave Road	\$10,540,000	Short Term	2028	ADT>250 now
4	130604, 130605 / NEW	130604, 130605	Rochford Rd/N Rochford Rd	Jct. Rochford Rd & S Rochford Rd	Lawrence County Line	1.87	Pavement Conditions plus growth factors	79.2	Pavement and/or Maintenance	\$102,850	Short Term	2028	
5	131202 / NEW	131202	Rochford Rd	Jct. Rochford Rd & Mystic Rd - West 4 miles to	beginning of pavement	4.05	Gravel to Pave Candidate		Pave Roadway, UTV/ATV signage	\$8,100,000	Short Term	2028	
7	5-Year 329901	329901	Silver City Road	US 385	Silver City (end of pavement)	4.60			Overlay	\$3,680,000	Short Term	2027	
8	5- Year 439801	439801	Edelweiss Mountain Rd	Custer Gulch Rd	Bear Gulch Rd	3.21			Base Stabilization	\$3,210,000	Short Term	2024	
9	NEW	439801	Edelweiss Mountain Rd	Custer Gulch Rd	Bear Gulch Rd	3.21	Gravel to Pave Candidate		Pave Road	\$7,062,000	Short Term	2028	ADT>250 now
11	5-Year 327001	327001	Bogus Jim Road	Norris Peak Rd	End of County Portion	2.74			Base Stabilization	\$2,740,000	Short Term	2024	
13	NEW	123402, 123403	Nemo Rd	Westberry Hill Rd	End of CHAPS Project #18.1	3.39	Potential Future Capacity Needs		Realignment 2023, Stabilization 2024	\$6,780,000	Short Term	2028	
13.1	CHAPS	123405	Nemo Rd	from the North County Line E/SE	to between Palmer Rd and Schmitz Trail	6.10			Resurface roadway1 (2019)	\$1,035,750	Short Term	2024	No Action Taken
17	5-Year 124101	124101	Universal Drive	Rapid City Limits	Sturgis Rd (SD 231)	1.39			Overlay	\$1,112,000	Short Term	2024	High Truck Traffic
18	CHAPS	126001	Deadwood Ave	Calamity Rd	Meade County Line	0.56			Reconstruct Roadway	\$1,182,050	Short Term	2028	
19	NEW	123501, 123602	Neck Yoke Rd/Spring Creek Rd	US Hwy 16	Arena Dr	3.33	Potential Future Capacity Needs, High Projected Truck Traffic, Dead End Road System		Capacity Improvements, Dead End/Alternative Road Access	\$6,660,000	Short Term	2028	
20	5-Year 320701	320701	143rd Avenue	Country Rd	South to End of County Portion	0.51			Reconstruction 2024	\$1,122,000	Short Term	2024	(RC Sewer Project)
22	5-Year 221301	221301	Dyess Avenue	Rapid City Limits	Country Rd	0.25			Reconstruct	\$550,000	Short Term	2027	Design w/ City of Rapid City

Project #	PROJECT SOURCE: 5-Yr. Co. Road # / CHAPS / NEW	GIS ID #	Road Segment	From	To	Miles	GIS Category (New Project)	Avg. PCI	Recommendation / Improvement (Work Type / Action)	Cost (Estimation)	Time Frame (Short Term = 2024-2028)	Completion Year	Rationale / Project Status
SHORT-TERM ROADWAYS													
25	5-Year 120901 120902	120901, 120902	Reservoir / Lamb Road	Old Folsom Rd	SD 44	3.73			Reconstruct	\$8,206,000	Short Term	2026	Safety Project PH 6637(01) PCN 08W0
30	5-Year 420422	420422	Leroy Street	Plateau Ln	County Heights Ditch	0.19			Mill & Overlay	\$114,000	Short Term	2025	
31	5-Year 420401	420401	Albert Lane	Plateau Ln	Begin Ellendale Dr	0.38			Full Depth Reclamation & Overlay	\$456,000	Short Term	2025	
33	5-Year TBD	NA	Twilight Dr	End of Twilight Drive	Radar Hill Road	1.76			Construct	\$3,520,000	Short Term	2027	Extend Twilight to Radar Hill Road Apply for RAISE Grant
34	CHAPS	241401	Hwy (Co. Rd) 1416	I-90	151st Ave	2.01*			Reconstruct roadway3 (2016)	\$24,130,814	Short Term	2028	Currently Working with KLJ
35	NEW	121201	Radar Hill Rd	SD44	229 St (Box Elder city limits)	2.01	High Projected Truck Traffic (Intermodal Connection)		Capacity Improvements - Pending Recommendations of Radar Hill Corridor Study. Bicycle Facility Potential/Shoulder Width	\$16,784,009	Short Term	2028	Currently Working with KLJ
36	5-Year 227203	227203	151st Ave	Hwy (Co. Rd) 1416	Meade County Line	2.08			Overlay	\$1,664,000	Short Term	2026	
37	5-Year 145703	145703	233rd Street	154 Ave	161 Ave	6.80			Base Stabilization	\$4,080,000	Short Term	2024	
38	5-Year 144501	144501	161st Avenue	Hwy (Co. Rd) 1416	Meade County Line	3.07			Reconstruct	\$6,754,000	Short Term	2025	
39	5-Year 158901	158901	Bombing Range Road	Pennington County Line	SD 44	6.78			Reconstruct (Safety issue and very poor pavement conditions 50% or below)	\$14,916,000	Short Term	2026	Pending RAISE Grant funding
40	5-Year 150805 150806	150805	Creighton Road	213th	Babcock Road	4.80			Base Stabilization	\$3,840,000	Short Term	2024	
41	NEW	151402	Kelly Hill Rd	Creighton Rd/192 Ave	Quinn Rd	4.12	Pavement Conditions		Pavement and/or Maintenance	\$226,600	Short Term	2028	
TOTAL SHORT-TERM ROADWAY PROJECT COSTS										\$162,186,073			

SHORT-TERM INTERSECTIONS

Project #	PROJEC SOURCE 5-Yr. Plan / Co. Road # / CHAPS / New	GIS ID #	Intersection	Category	Recommendation / Improvement (Work Type / Action)	Cost (Estimation)	Time Frame (Short Term = 2024-2028)	Completion Year	Comments / Project Status
6	CHAPS	130801/131801	Deerfield Road / Mystic Road		Reduce curvature along Mystic Road approach	\$50,000	Short Term	2024	No Action Taken
10	CHAPS	US 385/329901	US 385 / Silver City Road		Reconstruct intersection to improve sight distance looking south	\$150,000	Short Term	2025	No Action Taken
12	CHAPS	323301/US 16	Silver Mountain Road / Highway 16		Realign Silver Mountain Road approach to reduce skew	\$50,000	Short Term	2024	No Action Taken
13.2	5-Year 123405 223801 / 2024 MTP Study Intersection 3	123404/223801	Nemo Road / Norris Peak Road		Reconstruct - Horizontal Curve PH4081(20) 5% Meade County (Other)	\$500,000	Short Term	2024	Intersection Improvement (Nemo Rd portion covered by chaps. Not completed. 2024 MTP Study Intersection 3
14	CHAPS / 2024 MTP Study Intersection 3	123404/223801	Nemo Road / Norris Peak Road		Realign approaches to soften turn angles	\$50,000	Short Term	2024	No Action Taken / 2024 MTP Study Intersection 3
15	CHAPS	SD 40/123302	SD 40 / Rockerville Road		Remove trees causing poor sight distance, realign skewed driveway	\$100,000	Short Term	2024	Trees in SDDOT ROW - HWY 40. Realign driveway. No Action Taken
16	CHAPS	Sturgis Rd (SD 231)/421401	Sturgis Road (SD 231) / Merritt Road		Signalize Intersection	\$750,000	Short Term	2025	No Action Taken
21	NEW	122001/SD 79	Lower Spring Creek Rd & Hwy 79	High Crash Intersection	Intersection Safety Improvement Project	\$600,000	Short Term	2028	

SHORT-TERM INTERSECTIONS

Project #	PROJEC SOURCE 5-Yr. Plan / Co. Road # / CHAPS / New	GIS ID #	Intersection	Category	Recommendation / Improvement (Work Type / Action)	Cost (Estimation)	Time Frame (Short Term = 2024-2028)	Completion Year	Comments / Project Status
23	NEW	SD 44/120601	Twilight Dr & SD 44	High Crash Intersection	Add warning signs and conduct signal timing and coordination adjustments	\$20,000	Short Term	2028	
24	CHAPS / 2024 MTP Study Intersection 13	Concourse Rd/120601	Concourse Rd & Twilight Drive		Add intersection warning signs along curved approaches	\$20,000	Short Term	2028	No Action Taken / 2024 MTP Study Intersection 13
26	NEW	321701/US Hwy 16 Bypass	I-90 Service Rd S & US Hwy 16 Bypass	High Crash Intersection	Intersection Safety Improvement Project	\$600,000	Short Term	2028	
27	NEW	327401/SD 44	Jolly Ln & SD 44	High Crash Intersection	Mitigate Queueing Issues	\$100,000	Short Term	2028	
28	CHAPS		SD 44 / Covington Street		Signalize Intersection	\$350,000	Short Term	2028	No Action Taken
29	NEW		Twilight Dr & Degeest Dr	High Crash Intersection	Add intersection warning signs, Safety Improvement Project	\$20,000	Short Term	2028	
32	NEW	120601/420427	Twilight Dr & Plateau Ln	High Crash Intersection	Add intersection warning signs, Safety Improvement Project	\$20,000	Short Term	2028	
42	NEW / 2024 MTP Study Intersection 14		Old Folsom Rd & Lower Spring Creek Rd		Lighting, Advance Warning Sign Installation, Minor Intersection Alignment Adjustments	\$200,000	Short Term		2024 MTP Study Intersection 14
43	NEW / 2024 MTP Study Intersection 2		Twilight Dr & Reservoir Rd		Lighting	\$50,000	Short Term		2024 MTP Study Intersection 2
44	NEW / 2024 MTP Study Intersection 12		Twilight Dr & Covington St		Lighting	\$50,000	Short Term		2024 MTP Study Intersection 12
TOTAL SHORT-TERM INTERSECTION PROJECT COSTS						\$3,680,000			

Table 28- Long-Term Roadway, Intersection, and Bike/Ped Projects

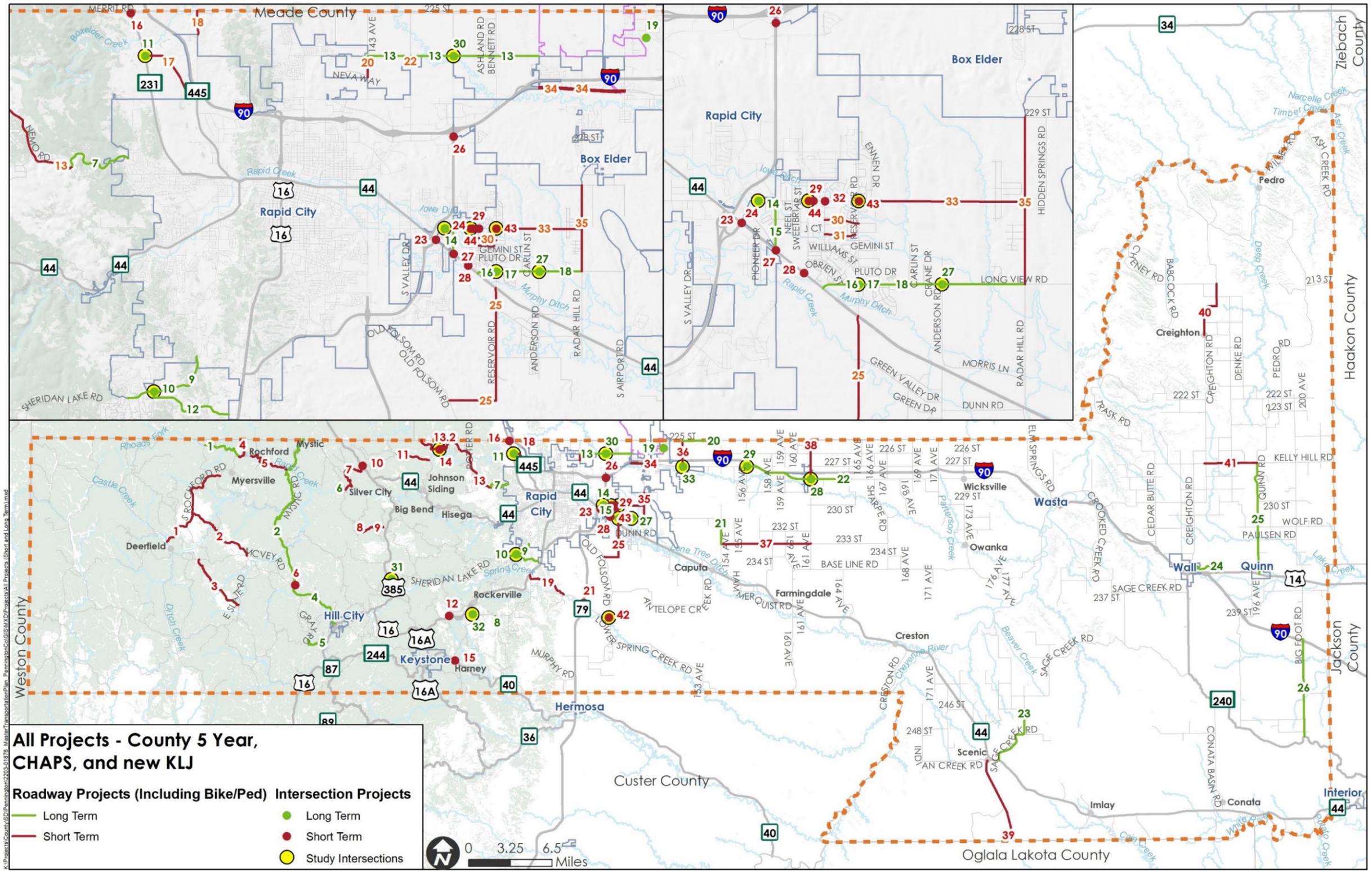
Project #	PROJECT SOURCE: 5-Yr. Plan / Co. Road # / CHAPS / NEW	GIS ID #	Road Segment	From	To	Miles	GIS Category (New Project)	Avg. PCI	Recommendation / Improvement (Work Type / Action)	Cost (Estimation)	Time Frame (Long Term = 2029+)	Completion Year	Rationale / Project Status
LONG-TERM ROADWAYS													
1	430501 / NEW	430501	Rochford Rd	S Rochford Rd	Camp Five Rd	3.37	Gravel to Pave Candidate		Pave Road, UTV/ATV signage, Bicycle Facility Potential	\$6,740,000	Long Term	2029+	ADT>250 2045.
2	CHAPS	131801, 131802	Mystic Rd	Rochford Rd	Tigerville Junction	11.43			Pave Roadway 2	\$11,372,050	Long Term	2029+	No Action Taken
3	CHAPS	131202	Rochford Rd	Rochford Rd	East to Lawrence County Line	3.56			Pave Roadway 2	\$6,403,700	Long Term	2029+	
4	NEW	130801	Deerfield Rd	US 16 (Hill City)	Mystic Rd	5.35	Potential Future Capacity Needs, High Projected Truck Traffic		Capacity Improvements	\$10,700,000	Long Term	2029+	
5	CHAPS	131701	Reno Gulch Rd	Reno Gulch Park	US 385	2.07			Pave Roadway	\$7,654,300	Long Term	2029+	Grind/Base Stabilization/Chip Seal
6	NEW	329902	Silver City Rd	Sherman St	West for .4 miles	0.40	Gravel to Pave Candidate		Pavement Construction Project	\$800,000	Long Term	2029+	ADT>250 2045
7	NEW	123401	S Canyon Rd	Roubaix Dr (Rapid City)	Begin Nemo Rd	1.90	PCI, Proposed Shoulder Bikeway		Pavement and/or Maintenance, Bicycle Facility Potential	\$1,520,000	Long Term	2029+	
8	NEW	425001	Pine Grove Rd	Neck Yoke Rd	S 1 mile	0.98	Gravel to Pave Candidate		Pave Road	\$1,960,000	Long Term	2029+	ADT>250 2030
9	NEW	122801	Sheridan Lake Rd	Rapid City Limits	Albertta Dr	2.22	Future Intersection LOS, Proposed RC Bike Route, High Projected Truck Traffic		Capacity Improvements	\$4,440,000	Long Term	2029+	Bicycle Shoulder is currently 6' wide to Albertta Dr. then is curb/gutter w/ no shoulder to Spring Canyon Tr.
12	NEW	326601	Moon Meadows Dr	Dunsmore Rd.	US 16	2.18	Potential Future Capacity Needs, Future Intersection LOS (Bottlenecks)		Capacity Improvements	\$5,600,000	Long Term	2029+	
13	NEW	221402	Country Rd	143 Ave	West Gate	4.00	Potential Future Capacity Needs		Capacity Improvements	\$8,000,000	Long Term	2029+	
15	NEW	327401	Jolly Ln	SD 44	Twilight Dr	0.59	High Crash Intersection at SD 44		Reconstruct to three lane section	\$1,298,000	Long Term	2029+	

Project #	PROJECT SOURCE: 5-Yr. Plan / Co. Road # / CHAPS / NEW	GIS ID #	Road Segment	From	To	Miles	GIS Category (New Project)	Avg. PCI	Recommendation / Improvement (Work Type / Action)	Cost (Estimation)	Time Frame (Long Term = 2029+)	Completion Year	Rationale / Project Status
LONG-TERM ROADWAYS													
16	NEW	223201	Long View Rd	SD 44	Reservoir Rd	0.45	Future Intersection LOS, High Projected Truck Traffic		Capacity Improvements, Bicycle Facility Potential	\$900,000	Long Term	2029+	
18	NEW	223202	Long View Rd	Reservoir Rd	Radar Hill Rd	2.00	Pavement Conditions plus growth factors, High Projected Truck Traffic	76.6	Pavement Maintenance, Capacity Improvements, Bicycle Facility Potential	\$4,400,000	Long Term	2029+	
20	NEW	227201	225 St	151st Ave	154 Ave	3.00	Gravel to Pave Candidate		Pave Road	\$6,000,000	Long Term	2029+	ADT>250 2045
21	CHAPS	123202	154th Ave	Long View Rd	SD 44	2.01			Pave roadway	\$10,759,050	Long Term	2029+	Partially Paved 2014
22	NEW	241403, 241404, 241405	Hwy (Co. Rd) 1416	156 Ave	164 Ave	8.29	Pavement Conditions plus growth factors, High Projected Truck Traffic	83.4	Reconstruct Roadway	\$18,238,000	Long Term	2029+	
23	NEW	159005	Sage Creek Rd	SD 44	Bear Creek Rd	5.37	Gravel to Pave Candidate		Pavement Construction Project	\$10,740,000	Long Term	2029+	ADT>250 2045. Sage creek was paved from Bear Creek Rd to 237 St 2023. This project paves the remainder to SD 44.
25	NEW	151301, 151302	Quinn Rd	US Hwy 14	Kelly Hill Rd	8.76	Pavement Conditions plus growth factors	79.5	Pavement and/or Maintenance	\$7,008,000	Long Term	2029+	
26	NEW	151101	Big Foot Rd	I90	SD 240	7.59	Gravel to Pave Candidate		Pave Road	\$15,180,000	Long Term	2029+	ADT>250 2045
TBD	NEW	NA	Ranch Road	TBD	TBD	TBD	Dead End System Road		Construct	TBD	Long Term	2029+	
TOTAL LONG-TERM ROADWAY PROJECT COST										\$139,713,100			

LONG-TERM INTERSECTIONS

Project #	PROJECT SOURCE: 5-Yr. Plan / Co. Road # / CHAPS / NEW	GIS ID #	Intersection	Category	Recommendation / Improvement (Work Type / Action)	Cost	Time Frame (Long Term = 2029+)	Completion Year	Comments / Project Status
11	CHAPS	Sturgis Rd (SD 231)/124101	Sturgis Road (SD 231) / Universal Drive		Signalize Intersection	\$350,000	Long Term	2029+	No Action Taken (CHAPS) / 2024 MTP Study Intersection 10
10	NEW	122801/425304	Sheridan Lake Rd & Dunsmore Rd	Future Intersection LOS, Improve Signal Timing	Improve Signal Timing; E.B.L. turn lane, skews, and other issues; Bicycle Facility Potential	\$750,000	Long Term	2029+	2024 MTP Study Intersection 1
14	NEW		Concourse Rd & Twilight Dr	Future Intersection LOS	Perform a traffic study to determine if signalization is warranted.	\$50,000	Long Term	2029+	2024 MTP Study Intersection 13
17	NEW		Longview Rd & Reservoir Rd	Future Intersection LOS	Change to 2-way stop intersection with stops on Reservoir Rd. Improve Lighting for safety issues, Bicycle Facility Potential	\$300,000	Long Term	2029+	2024 MTP Study Intersection 4
19	NEW		Liberty Blvd & Tower Rd	High Crash Intersection	Intersection Safety Improvement Project	\$750,000	Long Term	2029+	
27	NEW / 2024 MTP Study Intersection 5		Anderson Rd & Longview Rd	Lighting	Lighting, Clear Trees / Sightline Obstruction	\$50,000	Long Term	2029+	2024 MTP Study Intersection 5
28	NEW / 2024 MTP Study Intersection 6		161st Ave & Hwy 1416	Access Management	Access Management / Intersection Safety	\$300,000	Long Term	2029+	2024 MTP Study Intersection 6
29	NEW / 2024 MTP Study Intersection 7		156th Ave & Hwy 1416		No Improvements Recommended at this time.	\$0	Long Term	2029+	2024 MTP Study Intersection 7
30	NEW / 2024 MTP Study Intersection 8		Country Rd & Elk Vale Rd	Lighting / Advance Warning	Intersection Lighting, Advance Warning Signage/Rumble Strips	\$300,000	Long Term	2029+	2024 MTP Study Intersection 8
31	NEW / 2024 MTP Study Intersection 9		Sheridan Lake Rd & US Hwy 385	Lighting / Advance Warning	Intersection Lighting, Advance Warning Signage/Beacons	\$300,000	Long Term	2029+	2024 MTP Study Intersection 9
32	NEW / 2024 MTP Study Intersection 11		Neck Yoke Rd & S Rockerville Rd	Lighting / Sightline	Lighting, Sightline Improvements, Rumble Strips	\$150,000	Long Term	2029+	2024 MTP Study Intersection 11
33	NEW / 2024 MTP Study Intersection 15		151st Ave & Hwy 1416	Skew	Correct Skew, Modify Adjacent Private Approach	\$350,000	Long Term	2029+	2024 MTP Study Intersection 15
TOTAL LONG-TERM INTERSECTION PROJECT COST						\$3,650,000			
LONG-TERM BICYCLE AND PEDESTRIAN ONLY									
24	CHAPS		Wall trail extension		Extend Wall Loop Trail east to provide US 14 connection	\$500,000	Long Term	2029+	No Action Taken (CHAPS)

Figure 70 - Prioritized Pennington County Transportation Projects (Short- and Long-Term)



Source: Pennington County, Rapid City MPO, SD GIS Data, SDDOT, ESRI, KLI

February 2024

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APPENDIX A: Public Engagement

Pennington County MTP Public Input Meeting (PIM) #1

Introduction

The public involvement for phase one (1) consisted of identifying needs and desires of the community for the development of the Pennington County Master Transportation Plan (MTP).

Stakeholders included in our outreach efforts:

- Ellsworth Air Base
- Rapid Transit
- EMS Services
- Cities of Rapid City, Wall, Hill City
- Other surrounding communities

Methods and Activities

Efforts were made to provide ample opportunities for the public and stakeholders to provide input with, three (3) public meetings in communities throughout Pennington County, website with interactive map, and targeted advertising with newspaper and social media.

Public Input Meetings

During round 1, three public meetings were held.

Rapid City

June 13

Wall

June 14

Hill City

June 15

Advertising for each public meeting consisted of public notices in area newspapers, targeted social media, and press release.

Newspaper advertising:**Rapid City Journal**

Run dates May 25 and June 1

RAPID CITY AREA METROPOLITAN PLANNING ORGANIZATION (MPO) Notice of Public Open House & Informational Meeting Pennington County Master Transportation Plan

The Rapid City Area Metropolitan Planning Organization (MPO) in conjunction with Pennington County, the South Dakota Department of Transportation (SDDOT) and the Federal Highway Administration (FHWA), will hold a series of open house style public meetings to discuss and receive public comment on the development of a Pennington County Master Transportation Plan (MTP). The purpose of the public meetings is to gather information on county and community needs and desires as input into a long-range, multi-modal plan to address future transportation needs of Pennington County.

Information will be available at each meeting documenting the existing conditions of transportation systems in Pennington County. Public comment will be solicited from the public and interested persons on transportation issues throughout Pennington County.

The public open house meetings are planned for the following dates and locations:

June 13, 2023

Pennington County
Commission Chambers
130 Kansas City St Suite 100
Rapid City, SD 57701
5:30 to 7:00 PM

June 14, 2023

Wall Community Center
501 Main Street
Wall, SD 57790
5:30 to 7:00 PM

June 15, 2023

Hill City Community Center
227 Walnut Ave
Hill City, SD 57745
5:30 to 7:00 PM

Staff from Pennington County and their consultant will be available to discuss the Pennington County MTP. All persons interested in transportation issues are invited to attend the meeting to share their views and concerns. Public and written comments will be taken as part of the public input meeting specific to the Pennington County MTP.

Written comments should be sent to the attention of KLJ Engineering, Attn: Pennington MTP, 330 Knollwood Drive, Rapid City, SD 57701, or by email to steve.grabill@kljeng.com. Written public comment will be accepted on the Pennington County MTP through July 2, 2023.

For more information regarding the Pennington County MTP contact KLJ Project Manager, Steve Grabill at 605.721.5553. Information about the Pennington County MTP is available online at bit.ly/penncoMTP. Comments may also be provided on the website.

Notice is further given to individuals with disabilities that this public meeting is being held in a physically accessible place. Any individuals with disabilities who will require a reasonable accommodation in order to participate in the public meeting should submit a request to the Highway Department at (605) 394-2166 or 1-800-877-1113 (Telecommunication Relay Service for the Deaf). Please request the accommodation no later than 2 business days prior to the meeting in order to ensure accommodations are available.

(Published May 25 & June 1, 2023, at the total approximate cost of \$249.12 and may be viewed free of charge at www.sdpublicnotices.com)

Legal No: 57120

Wall Courant

Run dates May 25 and Jun 1

**NOTICE OF
PUBLIC OPEN
HOUSE &
INFORMATIONAL
MEETING**

**PENNINGTON COUNTY MASTER
TRANSPORTATION PLAN
RAPID CITY AREA METROPOLITAN
PLANNING ORGANIZATION (MPO)**

The Rapid City Area Metropolitan Planning Organization (MPO) in conjunction with Pennington County, the South Dakota Department of Transportation (SDDOT) and the Federal Highway Administration (FHWA), will hold a series of open house style public meetings to discuss and receive public comment on the development of a Pennington County Master Transportation Plan (MTP). The purpose of the public meetings is to gather information on county and community needs and desires as input into a long-range, multi-modal plan to address future transportation needs of Pennington County.

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June 13, 2023
Pennington County
Commission Chambers
130 Kansas City St Suite 100
Rapid City, SD 57701
5:30 to 7:00 PM

June 14, 2023
Wall Community Center
501 Main Street
Wall, SD 57790
5:30 to 7:00 PM

June 15, 2023
Hill City Community Center
227 Walnut Ave
Hill City, SD 57745
5:30 to 7:00 PM

Staff from Pennington County and their consultant will be available to discuss the Pennington County MTP. All persons interested in transportation issues are invited to attend the meeting to share their views and concerns. Public and written comments will be taken as part of the public input meeting specific to the Pennington County MTP.

Written comments should be sent to the attention of KLJ Engineering, Attn: Pennington MTP, 330 Knollwood Drive, Rapid City, SD 57701, or by email to steve.grabill@kljeng.com. Written public comment will be accepted on the Pennington County MTP through July 2, 2023.

For more information regarding the Pennington County MTP contact KLJ Project Manager, Steve Grabill at 605.721.5553. Information about the Pennington County

MTP is available online at bit.ly/penncoMTP. Comments may also be provided on the website.

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[Published May 25 & June 1, 2023, at the total approximate cost of \$71.07 and may be viewed free of charge at www.sdpublicnotices.com]

Hill City Preailer News

Run dates May 24 and May 31

Publish May 24, 2023 and May 31, 2023

Public Notice (display ad)

**RAPID CITY AREA METROPOLITAN PLANNING ORGANIZATION (MPO)
Notice of
Public Open House & Informational Meeting
Pennington County Master Transportation Plan**

The Rapid City Area Metropolitan Planning Organization (MPO) in conjunction with Pennington County, the South Dakota Department of Transportation (SDDOT) and the Federal Highway Administration (FHWA), will hold a series of open house style public meetings to discuss and receive public comment on the development of a Pennington County Master Transportation Plan (MTP). The purpose of the public meetings is to gather information on county and community needs and desires as input into a long-range, multi-modal plan to address future transportation needs of Pennington County.

Information will be available at each meeting documenting the existing conditions of transportation systems in Pennington County. Public comment will be solicited from the public and interested persons on transportation issues throughout Pennington County. The public open house meetings are planned for the following dates and locations:

<p>June 13, 2023 Pennington County Commission Chambers 130 Kansas City St Suite 100 Rapid City, SD 57701 5:30 to 7:00 PM</p>	<p>June 14, 2023 Wall Community Center 501 Main Street Wall, SD 57790 5:30 to 7:00 PM</p>	<p>June 15, 2023 Hill City Community Center 227 Walnut Ave Hill City, SD 57745 5:30 to 7:00 PM</p>
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Staff from Pennington County and their consultant will be available to discuss the Pennington County MTP. All persons interested in transportation issues are invited to attend the meeting to share their views and concerns. Public and written comments will be taken as part of the public input meeting specific to the Pennington County MTP.

Written comments should be sent to the attention of KLJ Engineering, Attn: Pennington MTP, 330 Knollwood Drive, Rapid City, SD 57701, or by email to steve.grabill@kljeng.com. Written public comment will be accepted on the Pennington County MTP through July 2, 2023.

For more information regarding the Pennington County MTP contact KLJ Project Manager, Steve Grabill at 605.721.5553. Information about the Pennington County MTP is available online at bit.ly/penncoMTP. Comments may also be provided on the website.

Notice is further given to individuals with disabilities that this public meeting is being held in a physically accessible place. Any individuals with disabilities who will require a reasonable accommodation in order to participate in the public meeting should submit a request to the Highway Department at (605) 394-2166 or 1-800-877-1113 (Telecommunication Relay Service for the Deaf). Please request the accommodation no later than 2 business days prior to the meeting in order to ensure accommodations are available.

Notice published twice at the total approximate cost of \$###.##.

Two campaigns were distributed on social media.

- 1) Social media advertising consisted of targeted ads on Facebook/Instagram to Rapid City zip codes (57701, 57702, and 57703), Wall (57790) and Hill City (57745). The purpose of this campaign was to inform residents about the public meeting.
- 2) Facebook/Instagram ad with a boarder audience to the Rapid City, Hill City, Wall and surrounding people promoting the online input opportunity with a direct link to the project website.

Rapid City meeting ad (animated)

Run dates: June 8- June 13

Cost: \$70

Results: Reached 25,783 people

KLJ Engineering
Sponsored · 🌐

Join us for a public meeting for Pennington County's Master Transportation Plan. This multi-modal plan needs your input as we prepare for the future transportation needs of the county. Please join us on June 13 from 5:30- 7 pm in the Pennington County Commission Chambers or follow the link below for additional information and opportunities.

PENNINGTON COUNTY
MASTER TRANSPORTATION PLAN

PUBLIC MEETING
June 13
5:30-7 PM
Pennington County Commission Chambers in Rapid City

bit.ly/penncomtp
Pennington MTP [Learn more](#)

3 likes 1 share

Like Comment Share

Wall meeting ad (animated)

Run dates: June 8-14

Cost: \$38.58

Results: Reached 1,758 people

The image shows a Facebook advertisement for a public meeting. At the top, the ad is sponsored by KLJ Engineering. The main text of the ad reads: "Join us for a public meeting for Pennington County's Master Transportation Plan. This multi-modal plan needs your input as we prepare for the future transportation needs of the county. Please join us on June 14 from 5:30- 7 pm at the Wall Community Center or follow the link below for additional information and opportunities." Below the text is a video player showing a graphic with the Pennington County logo and the title "MASTER TRANSPORTATION PLAN". The graphic also features icons for a pedestrian, a bicycle, a truck, and a car, representing different modes of transportation. It specifies the event is a "PUBLIC MEETING" on "June 14" from "5:30-7 PM" at the "Wall Community Center". The video player interface includes a play button, a progress bar, a timestamp of "-0:00", and an "HD" icon. Below the video, there is a link "bit.ly/penncomtp" and the text "Pennington County MTP" with a "Learn more" button. At the bottom, it shows "1 share" and interaction options for "Like", "Comment", and "Share".

KLJ Engineering
Sponsored · 🌐

Join us for a public meeting for Pennington County's Master Transportation Plan. This multi-modal plan needs your input as we prepare for the future transportation needs of the county. Please join us on June 14 from 5:30- 7 pm at the Wall Community Center or follow the link below for additional information and opportunities.

PENNINGTON COUNTY

MASTER TRANSPORTATION PLAN

PUBLIC MEETING

June 14
5:30-7 PM

© Wall Community Center

bit.ly/penncomtp
Pennington County MTP

Learn more

1 share

Like Comment Share

Hill City meeting ad (animated)

Run dates: June 9-15

Cost: \$58.06

Results: Reached 3,309 people

KLJ Engineering
Sponsored · 🌐

Join us for a public meeting for Pennington County's Master Transportation Plan. This multi-modal plan needs your input as we prepare for the future transportation needs of the county. Please join us on June 15 from 5:30- 7 pm at the Hill City Community Center or follow the link below for additional information and opportunities.

PENNINGTON COUNTY

MASTER TRANSPORTATION PLAN

PUBLIC MEETING

June 15
5:30-7 PM

Hill City Community Center

bit.ly/penncomtp
Pennington County MTP

Learn more

1 share

Like Comment Share

Broad online engagement ad

Run dates: June 16- July 2

Cost: \$150

Results: Reached 43,286 people

The advertisement is a Facebook post from KLJ Engineering, a sponsored post. The text of the post reads: "Whether you walk, bike, or drive- share your input for Pennington County's Master Transportation Plan." Below the text is a large green graphic with the Pennington County logo in the top right corner. The graphic contains the text "PENNINGTON COUNTY" in a small yellow box, "MASTER TRANSPORTATION PLAN" in large white letters, and four icons representing a person walking, a bicycle, a truck, and a car. Below these icons is a yellow banner with the text "Share your feedback!". At the bottom of the ad, there is a link "bit.ly/penncomtp", the text "Pennington County MTP Share your feedback!", and a "Learn more" button. The bottom of the ad shows the standard Facebook interaction buttons: "Like", "Comment", and "Share".

KLJ Engineering
Sponsored · 🌐

Whether you walk, bike, or drive- share your input for Pennington County's Master Transportation Plan.

PENNINGTON COUNTY

MASTER TRANSPORTATION PLAN

Share your feedback!

bit.ly/penncomtp
Pennington County MTP
Share your feedback!

Learn more

Like Comment Share

Meeting attendance, discussion items, and comments collected from each meeting are as follows:

PIM #1: Rapid City, SD, June 13, 2023

Welcome & Presentation

An open house opportunity was offered prior to and after the formal presentation. Board displays of the County were available for viewing and discussion. Staff were available to discuss specific concerns attendees had, both prior to and after the formal presentation.

Steve Grabill welcomed attendees to the meeting.

Steve Grabill provided a PowerPoint presentation and gave an overview of what a Master Transportation Plan is for, that it has a 20-year planning horizon, and will respond to the changing needs within Pennington County. He said the plan will provide goals and project recommendations to address current and future needs.

Steve Grabill reviewed the schedule for the project, noting that another public meeting is tentatively scheduled for January 2024 to present draft plan recommendations and receive further input. He also noted that a Study Advisory Team comprised of MPO and County officials and staff were providing key direction for the study.

The presentation covered baseline conditions, including traffic, crash data, road surface conditions, functional classification, transit service, vision, goals, and objectives. Attendees were directed to provide comments verbally, through a printed comments sheet, via email, and the website.

Public Comments

Following the presentation, Steve Grabill opened discussion of transportation needs and issues within Pennington County.

- Attendee comment: UTV traffic has increased and is having a greater impact on County roads. High UTV speeds have been observed and UTV activity impacts road conditions and safety. Forest Service trails are incomplete, leading to more use of the County road system for recreation.

After the formal presentation was completed, members of the public joined staff for informal discussion. No further comments were received.

ATTENDANCE LIST



Pennington County Master Transportation Plan

Tuesday, June 13, 2023 – Rapid City, SD

Name	Organization/Business/Address/Email
Steve Grabill	KLJ / steve.grabill@kljems.com
Shawn Mayfield	KLJ / shawn.mayfield@kljey.com
Humberto Gils-Sanchez	KOTA Territory News
Matt Schmahf	West River Electric
Gary Drewas	PL Commissioner
JOE MILLER	PENNCO Hwy

PIM #1: Wall, SD, June 14th, 2023**Welcome & Presentation**

An open house opportunity was offered prior to and after the formal presentation. Board displays of the County were available for viewing and discussion. Staff were available to discuss specific concerns attendees had, both prior to and after the formal presentation.

Steve Grabill welcomed attendees to the meeting.

Steve Grabill provided a PowerPoint presentation and gave an overview of what a Master Transportation Plan is for, that it has a 20-year planning horizon, and will respond to the changing needs within Pennington County. He said the plan will provide goals and project recommendations to address current and future needs.

Steve Grabill reviewed the schedule for the project, noting that another public meeting is tentatively scheduled for January 2024 to present draft plan recommendations and receive further input. He also noted that a Study Advisory Team comprised of MPO and County officials and staff were providing key direction for the study.

The presentation covered baseline conditions, including traffic, crash data, road surface conditions, functional classification, transit service, vision, goals, and objectives. Attendees were directed to provide comments verbally, through a printed comments sheet, via email, and the website.

Public Comments

Following the presentation, Steve Grabill opened discussion of transportation needs and issues within Pennington County.

- Attendee comment: Gravel road conditions and maintenance is an issue. Primary roads where the public has commented to the Commission on in the past include Creighton Road, Babcock Road, and Sage Creek Road. Others where maintenance has also been mentioned as an issue include Pedro and Wilsey Roads. A problem observed has been overloaded trucks.
- Attendee comment: Why isn't the Radar Hill Road/Highway 1416 intersection included in the top 10 for intersection crash frequency? Mr. Grabill said he would verify that it didn't meet the top 10 in numbers of crashes.
- Attendee comment: It would be interesting to compare crash frequencies with Meade County and Minnehaha County
- Attendee comment: Transit service to Western Dakota Tech would be beneficial.

After the formal presentation was completed, members of the public joined staff for informal discussion. No further comments were received.

ATTENDANCE LIST



Pennington County Master Transportation Plan

Wednesday, June 14, 2023 – Wall, SD

Name	Organization/Business/Address/Email
Travis Lasseter	Pawnee BOC
Steve Grabill	KLJ
Neil Putnam	KLJ

PIM #1: Hill City, SD, June 15th, 2023**Welcome & Presentation**

An open house opportunity was offered prior to and after the formal presentation. Board displays of the County were available for viewing and discussion. Staff were available to discuss specific concerns attendees had, both prior to and after the formal presentation.

Steve Grabill welcomed attendees to the meeting.

Steve Grabill provided a PowerPoint presentation and gave an overview of what a Master Transportation Plan is for, that it has a 20-year planning horizon, and will respond to the changing needs within Pennington County. He said the plan will provide goals and project recommendations to address current and future needs.

Steve Grabill reviewed the schedule for the project, noting that another public meeting is tentatively scheduled for January 2024 to present draft plan recommendations and receive further input. He also noted that a Study Advisory Team comprised of MPO and County officials and staff were providing key direction for the study.

The presentation covered baseline conditions, including traffic, crash data, road surface conditions, functional classification, transit service, vision, goals, and objectives. Attendees were directed to provide comments verbally, through a printed comments sheet, via email, and the website.

Public Comments

Following the presentation, Steve Grabill opened discussion of transportation needs and issues within Pennington County.

- Attendee comment: Left turns are difficult from Old Hill City Road onto US 16
- Attendee comment: Rochford Road traffic will increase once it is paved.
- Attendee comment: It would help if UTV, bike and ped crashes was shown separately.
- Attendee comment: What is the threshold for asphalt vs. gravel?
- Attendee comment: With higher traffic, application of seal coats or MgCl for dust control should be considered as viable options to paving.
- Attendee comment: Traffic counts should be considered on a weekend in July to gather data on the impact of UTV traffic.
- Attendee comment: Deerfield Road and China Gulch Road are experiencing a lot of heavy truck traffic.
- Attendee comment: Reno Gulch has UTV safety concerns with curves and no shoulders.
- Attendee comment: We can improve notification of the public using Facebook. Steve Grabill said ads has been put on Facebook to notify the public.

After the formal presentation was completed, members of the public joined staff for informal discussion. One written comment, shown below, was received.

ATTENDANCE LIST



Pennington County Master Transportation Plan

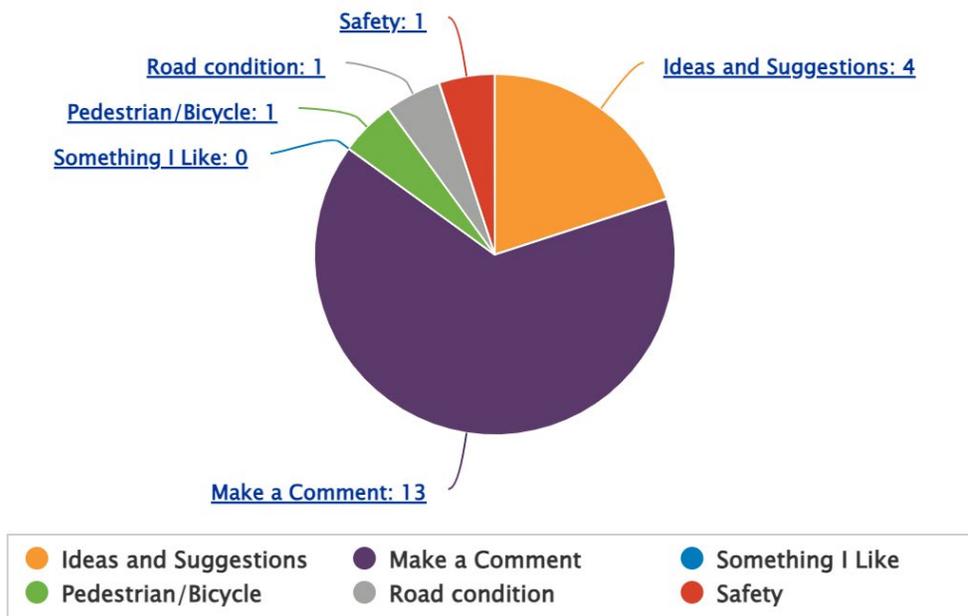
Thursday, June 15, 2023 – Hill City, SD

Name	Organization/Business/Address/Email
Steve Grabill	330 Knollwood Dr. Rapid City/ks
Lori & Bill Mauer	Hill City SD
Don Fosstnecht	Sheldon CA Ke PO Box 553 IKCB 57742
Jim Schreier	226 sunsetview CT Po Box 9
Eric Lind	23837 Placer Pl RC SD 57702

Website

A project website was developed to serve as an information hub for the public. Input was collected from the interactive map in which people could leave comments on range of topics including Safety, Road conditions, Pedestrian/Bicycle, Something I like, Ideas & Suggestions, Other comments. The site saw a total of 415 visitors with a total of 20 comments left on the map.

Category Totals



Pennington County MTP Public Input Meeting (PIM) #2

Introduction

The public involvement for phase two (2) consisted of an open house opportunity for reviewing the Pennington County Master Transportation Plan (MTP) and providing the opportunity for the public to make comment on the MTP Report's findings and project recommendations, as well as provide general comments of concern. Steve Grabill reviewed the schedule for the project, noting that the MTP was in the final stages of development and that further input received by the end of March would be incorporated into the final draft. He also highlighted that the project website is available, as well as comment sheets at the meeting for people to provide their comments. Attendees were directed to provide comments verbally, through a printed comments sheet, via email, and the website.

Stakeholders included in our outreach efforts:

- Ellsworth Air Base
- Rapid Transit
- EMS Services
- Cities of Rapid City, Wall, Hill City
- Other surrounding communities

Methods and Activities

Efforts were made to provide ample opportunities for the public and stakeholders to provide input with, three (3) public meetings in communities throughout Pennington County, website with interactive map, and targeted advertising with newspaper and social media.

Public Input Meetings

During round 2, three public meetings were held.

Rapid City

March 12

Wall

March 13

Hill City

March 14

Advertising for each public meeting consisted of public notices in area newspapers, targeted social media, and press release.

Newspaper advertising:

Rapid City Journal

Run dates February 22 and 29, 2024

Publish

Public Notice (display ad)

**RAPID CITY AREA METROPOLITAN PLANNING ORGANIZATION (MPO) Notice of
Public Open House & Informational Meeting
Pennington County Master Transportation Plan**

The Rapid City Area Metropolitan Planning Organization (MPO) in conjunction with Pennington County, the South Dakota Department of Transportation (SDDOT) and the Federal Highway Administration (FHWA), will hold a series of open house style public meetings to discuss and receive public comment on the draft Pennington County Master Transportation Plan (MTP). The purpose of the public meetings is to receive feedback on the draft MTP, which provides a long-range, multi-modal plan to address existing and future transportation needs of Pennington County.

Information will be available at each meeting reviewing the content of the MTP. Public comment will be solicited from the public and interested persons on transportation recommendations for Pennington County. The public open house meetings are planned for the following dates and locations:

<p>March 12, 2024 Pennington County Commission Chambers 130 Kansas City St Suite 100 Rapid City, SD 57701 5:30 to 7:00 PM</p>	<p>March 13, 2024 Wall Community Center City Council Meeting Room 501 Main Street Wall, SD 57790 5:30 to 7:00 PM</p>	<p>March 14, 2024 Hill City Community Center 227 Walnut Ave Hill City, SD 57745 5:30 to 7:00 PM</p>
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Staff from Pennington County and their consultant will be available to discuss the Pennington County MTP. All persons interested in transportation issues are invited to attend the meeting to share their views and concerns. Public and written comments will be taken as part of the public input meeting specific to the Pennington County MTP.

Written comments should be sent to the attention of KLJ Engineering, Attn: Pennington MTP, 330 Knollwood Drive, Rapid City, SD 57701, or by email to steve.grabill@kljeng.com. Written public comment will be accepted on the Pennington County MTP through April 1, 2024.

Hard copies of the draft MTP will be available for public viewing after March 4 at the Rapid City Public Library, and at Pennington County Planning and Zoning, and at the Pennington County Commissioners Office. For more information regarding the Pennington County MTP contact KLJ Project Manager, Steve Grabill at 605.721.5553. Information about the Pennington County MTP is available online at bit.ly/penncoMTP. Comments may also be provided on the website.

Notice is further given to individuals with disabilities that this public meeting is being held in a physically accessible place. Any individuals with disabilities who will require a reasonable accommodation in order to participate in the public meeting should submit a request to the Highway Department at (605) 394-2166 or 1-800-877-1113 (Telecommunication Relay Service for the Deaf). Please request the accommodation no later than 2 business days prior to the meeting in order to ensure accommodations are available.

Notice published twice at the total approximate cost of \$###.##.

**Newspaper Advertising
Hill City Prevaler**

Publish February 21, 2024 and February 28, 2024
Public Notice (display ad)

**RAPID CITY AREA METROPOLITAN PLANNING ORGANIZATION (MPO)
Notice of
Public Open House & Informational Meeting
Pennington County Master Transportation Plan**

The Rapid City Area Metropolitan Planning Organization (MPO) in conjunction with Pennington County, the South Dakota Department of Transportation (SDDOT) and the Federal Highway Administration (FHWA), will hold a series of open house style public meetings to discuss and receive public comment on the draft Pennington County Master Transportation Plan (MTP). The purpose of the public meetings is to receive feedback on the draft MTP, which provides a long-range, multi-modal plan to address existing and future transportation needs of Pennington County.

Information will be available at each meeting reviewing the content of the MTP. Public comment will be solicited from the public and interested persons on transportation recommendations for Pennington County. The public open house meetings are planned for the following dates and locations:

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Written comments should be sent to the attention of KLJ Engineering, Attn: Pennington MTP, 330 Knollwood Drive, Rapid City, SD 57701, or by email to steve.grabill@kljeng.com. Written public comment will be accepted on the Pennington County MTP through April 1, 2024.

Hard copies of the draft MTP will be available for public viewing after March 4 at the Rapid City Public Library, and at Pennington County Planning and Zoning, and at the Pennington County Commissioners Office. For more information regarding the Pennington County MTP contact KLJ Project Manager, Steve Grabill at 605.721.5553. Information about the Pennington County MTP is available online at bit.ly/penncoMTP. Comments may also be provided on the website.

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Notice published twice at the total approximate cost of \$###.##.

Newspaper Advertising**Wall Courant**

Publish February 22, 2024, and February 29, 2024

Public Notice (display ad)

RAPID CITY AREA METROPOLITAN PLANNING ORGANIZATION (MPO)
Notice of
Public Open House & Informational Meeting
Pennington County Master Transportation Plan

The Rapid City Area Metropolitan Planning Organization (MPO) in conjunction with Pennington County, the South Dakota Department of Transportation (SDDOT) and the Federal Highway Administration (FHWA), will hold a series of open house style public meetings to discuss and receive public comment on the draft Pennington County Master Transportation Plan (MTP). The purpose of the public meetings is to receive feedback on the draft MTP, which provides a long-range, multi-modal plan to address existing and future transportation needs of Pennington County.

Information will be available at each meeting reviewing the content of the MTP. Public comment will be solicited from the public and interested persons on transportation recommendations for Pennington County. The public open house meetings are planned for the following dates and locations:

March 12, 2024

Pennington County
 Commission Chambers
 130 Kansas City St Suite 100
 Rapid City, SD 57701
 5:30 to 7:00 PM

March 13, 2024

Wall Community Center
 City Council Meeting Room
 501 Main Street
 Wall, SD 57790
 5:30 to 7:00 PM

March 14, 2024

Hill City Community
 Center
 227 Walnut Ave
 Hill City, SD 57745
 5:30 to 7:00 PM

Staff from Pennington County and their consultant will be available to discuss the Pennington County MTP. All persons interested in transportation issues are invited to attend the meeting to share their views and concerns. Public and written comments will be taken as part of the public input meeting specific to the Pennington County MTP.

Written comments should be sent to the attention of KLJ Engineering, Attn: Pennington MTP, 330 Knollwood Drive, Rapid City, SD 57701, or by email to steve.grabill@kljeng.com. Written public comment will be accepted on the Pennington County MTP through April 1, 2024.

Hard copies of the draft MTP will be available for public viewing after March 4 at the Rapid City Public Library, and at Pennington County Planning and Zoning, and at the Pennington County Commissioners Office. For more information regarding the Pennington County MTP contact KLJ Project Manager, Steve Grabill at 605.721.5553. Information about the Pennington County MTP is available online at bit.ly/penncoMTP. Comments may also be provided on the website.

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Notice published twice at the total approximate cost of \$###.##.

Pennington County Master Transportation Plan
Public Input Meeting #2
Pennington County Courthouse
March 12, 2024
5:30 - 7:00 P.M. MST

Meeting Discussion Points

Meeting Attendees

- See attached

Welcome & Presentation

- An open house opportunity was offered, as well as a formal presentation. Board displays of the County were available for viewing and discussion. Staff were available to discuss specific concerns attendees had, both prior to and after the formal presentation.
- Steve Grabill welcomed attendees to the meeting.
- Since only County staff attended the meeting, and the staff had participated in earlier SAT meetings, no formal presentation was given.

Public Comments

- KLJ discussed the challenges with how developments within the county are impacting the County Road system. Traffic signals may need to be installed at some point in the future. The County does not have the expertise to maintain traffic signals. The potential for the County to contract with either Rapid City or SDDOT for maintenance was discussed.

No further comments were received.

ATTENDANCE LIST	
Pennington County Master Transportation Plan	
March 13, 2024 - Rapid City, SD	
Name	Business/Address/Email (Optional)
Steve Grabill	KLJ/Rapid City/Steve.Grabill@klj.com
Britney Motter	Penn Co
Stephan McJannetson	Penn Co

Pennington County Master Transportation Plan
 Public Input Meeting #2B
 Wall, SD Commission Room
 March 13, 2024
 5:30 - 7:00 P.M. MST

Meeting Discussion Points

Meeting Attendees

- See attached

Welcome & Presentation

- An open house opportunity was offered prior to and after the formal presentation. Board displays of the County were available for viewing and discussion. KLJ staff were available to discuss specific concerns attendees had, prior to, during and after the formal presentation.
- Steve Grabill welcomed attendees to the meeting.
- Steve Grabill provided a PowerPoint presentation and provided a review of the contents of the draft Master Transportation Plan. Steve Grabill reviewed the

schedule for the project, noting that the MTP was in the final stages of development and that further input received by the end of March would be incorporated into the final draft. He also highlighted that the project website is available, as well as comment sheets at the meeting for people to provide their comments. Attendees were directed to provide comments verbally, through a printed comments sheet, via email, and the website.

Public Comments

- Pennington County should bid out maintenance to people located near the roads to be maintained.
- East side County Roads are not being maintained often enough or at the proper times. After rains, some County Roads are like concrete and impossible to blade.
- Trucks have greater impacts than cars. Thresholds for paving should consider that one truck equals many cars.
- What will be done with Radar Hill Road? Mr. Grabill responded that most of it will be reconstructed as a 3-lane highway once funding is available.
- What problems do UTV/ATV traffic cause? Mr. Grabill responded that slower speeds cause delays and can impact safety. Gravel roads can be rutted due to improper driving on the roads. The MTP suggests better signing and addressing sight distance issues.
- Why isn't bicycle travel addressed on the east side of the County? Mr. Grabill responded that it was, but more on a policy level that in areas of heavier travel that 4-foot shoulders should be considered. He added that Pennington County is not looking to construct separated bicycle facilities.
- The County should consider paving all gravel roads due to the high cost of gravel road maintenance. Mr. Grabill pointed out that the paving threshold considers when high traffic on gravel roads can result in the cost for gravel road maintenance to exceed construction and maintenance of a paved road.
- Ambulances take too long; roads are too rough.
- Many concerns were raised concerning another study that considers closing bridges along the Interstate Highway.
- Is the section along Highway 1416 between Box Elder and New Underwood considered a high growth area? Mr. Grabill responded that it was.

After the formal presentation was completed, members of the public joined KLJ staff for informal discussion. No further comments were received.

ATTENDANCE LIST



Pennington County Master Transportation Plan

Wednesday, March 13, 2024 – Wall, SD

Name	Business/Address/Email (Optional)
Steve Grabill	KLJ/Rapid City/Steve.grabill@KLJSD.org
Todd Trask	P.O. BOX 34 WASTA, SD 57791
Dave Humphrey	Quinn SD
Eric A. Hansen	Wall, SD Box 404 Wall SD 57790
Jim Johnson	19725 223 rd St. QUINN
Clint Stangle	308 Kelly ave Wall SD 57790 clint.stangle@westview.coop
Carrie Schell	22955 Crooked Creek Rd Wall SD 57790
Carolynn Anderson	Wall City
Myra + Mary WILLIAMS	wall
Dawn Richter	Quinn
Paul Jones	Quinn

Pennington County Master Transportation Plan
Public Input Meeting #2C
Hill City, SD Hill City Community Center
March 14, 2024
5:30 - 7:00 P.M. MST

Meeting Discussion Points

Meeting Attendees

Welcome & Presentation

- An open house opportunity was offered, as well as a formal presentation. Board displays of the County were available for viewing and discussion. KLJ staff were available to discuss specific concerns attendees had.
- Steve Grabill welcomed the attendee to the meeting.
- Since only one resident attended the meeting and he didn't want a formal presentation, no formal presentation was given.

Public Comments

- Guard rail is needed along the new Rochford Road bridge. Mr. Grabill said he would pass this along to the County Highway Superintendent.
- Flashing speed zone signs would help near Rochford. Mr. Grabill responded that perhaps a temporary speed trailer could also work.

No further comments were received.

APPENDIX B: Example ATV/UTV Ordinance

THE FOLLOWING IS A POSSIBLE DRAFT ORDINANCE THAT ADDRESSES UTV/ATV REGULATIONS WITHIN THE COUNTY. IT IS MODELED FROM A COUNTY IN COLORADO.

Some of the items may not be appropriate for Pennington County. We strongly recommend consultation with local law enforcement and the state's attorney office.

DEFINITIONS

1. *All-Terrain Vehicle (ATV)* means a three or four wheeled vehicle that travels on low-pressure tires with a seat that is straddled by the rider and with handlebars for steering control.
2. *Child Restraint System*, also known as a car seat, means a specially designed seating system that is designed to protect, hold, or restrain a child in a motor vehicle in such a way as to prevent or minimize injury to the child in the event of a motor vehicle accident that is either permanently affixed to a motor vehicle or is affixed to such vehicle by a safety belt or a universal attachment system, and that meets the federal motor vehicle safety standards.
3. *Defacing Property* means any method of defacement, including but not limited to painting, drawing, writing, or otherwise marring the surface of public or private property by use of paint, spray paint, ink, or any other substance or object, without consent of the owner.
4. *Litter* means all rubbish, waste material, refuse, garbage, trash, debris, or other foreign substances, solid or liquid, of every form, size, kind, and description.
5. *Marring Property* means impairing the appearance of public or private property, including, but is not limited to, driving off the traveled way and leaving tire tracks, skid marks, or otherwise disturbing tundra, wetlands, and any vegetation or natural or manmade surfaces of any kind.
6. *Motorcycle* means an auticycle or a motor vehicle that uses handlebars or any other device connected to the front wheel to steer and that is designed to travel on not more than three wheels in contact with the ground including any dirt bike or other motorcycle primarily used for off road use.
7. *Occupant* is a passenger or rider of a vehicle regulated by this ordinance.
8. *Off-highway vehicle (OHV)* is any self-propelled vehicle that is designed to travel on wheels or tracks in contact with the ground, designed primarily of use off of the public highways, and generally and commonly used to transport persons for recreational purposes, but not (1) a vehicle designed and used primarily for travel on, over, or in the water, (2) snowmobiles, (3) golf carts, (4) vehicles designed and used to carry individuals with disabilities, (5) vehicles designed and used specifically for agricultural, logging, or mining purposes, and other uses exempt under state law.
9. *Operator* means the driver of a vehicle regulated by this ordinance.

10. *Pennington County Public Right-of-Ways* means those roads designated as primary and secondary roads set forth on the official Pennington County Road map and are open to such use by official designation.

REGULATIONS

11. It is unlawful to operate an unlicensed OHV, ATV, or unlicensed/ unregistered motorcycle on Pennington County Public Rights-of-Ways where such use is prohibited by Resolution, Ordinance, or Official Designation, unless:

- a. it is registered/ permitted with the State of South Dakota and the registration / permit is displayed.
 - b. it has at least one lighted head and tail lamp, each having the minimum candlepower prescribed by the State of South Dakota between the hours of sunset and sunrise.
 - c. the driver has a valid driver's license.
 - d. the driver has the required minimum liability insurance required under South Dakota law.
 - e. each occupant wears a safety belt if the OHV is installed with one by the manufacturer.
 - f. any child under the age of eight years old who is transported by an OHV or ATV is properly restrained in a child restraint system as required under state law and installed according to the manufacturer's instructions.
 - g. each occupant uses eye protection consisting of (1) goggles or eyeglasses with lenses made of safety glass or plastic, (2) a helmet containing eye protection made of safety glass or plastic, or (3) a full windshield.
 - h. all occupants under the age of eighteen (18) years old, wear a helmet of the type and design manufactured for use by operators of motorcycles, including a properly secured chin strap when the OHV is in motion. The helmet must meet or exceed the federal Department of Transportation helmet standards set forth under 49 C.F.R. § 571.218 Standard No. 218.
 - i. the OHV /ATV/ motorcycle contains no more occupants than it is designed to hold when in motion.
 - j. the operator obeys all applicable traffic laws state law and county ordinances.
12. It is unlawful for any person owning an OHV, ATV, or motorcycle, to allow, authorize, suffer, or permit another person to operate such OHV in violation of this Ordinance.
13. This Ordinance shall be enforced by any law enforcement officer.
14. It is unlawful for any person to deposit, throw, or leave any litter on any public or private property or to deface public or private property.
15. Any person who violates any provision of this Ordinance, except for litter, defacing, or marring property violations, shall be guilty of a ____ offense which the fine shall be \$____.
16. Any person, operator, or occupant who deposits, throws, or leaves any litter on any public or private property shall be subject to the penalty assessments.
17. Any person, operator, or occupant who defaces, mars, or causes, aids-in, or permits the defacing or marring of any public or private property shall be subject to the penalty assessments set forth under ____.
18. The penalty assessment procedure concerning the issuance of a summons and complaint under ____ shall be followed when issuing a ticket for any violation of this Ordinance.

19. All fines, penalties, or forfeitures for the violation of this Ordinance, but not any surcharge imposed by the Court upon conviction pursuant to ___ shall be paid to the County Treasurer of Pennington County.

20. Reckless driving as provided by ____ and careless driving as provided by ___ apply to the operation of OHVs hereunder and are prohibited. A violation is subject to punishment pursuant to ____.

APPENDIX C: Study Advisory Team Meeting Minutes

Pennington County Master Transportation Plan (MTP)

4/11/2023 Kickoff Meeting Minutes

Meeting Attendance:

Name	Title	Organization	Email	Phone
Joseph Miller	Highway Superintendent	Pennington County Highway Department	Joe.miller@pennco.org	605-394-2166 (o) 605-391-9370 (m)
Sean Smith	Asst. Highway Superintendent	Pennington County Highway Department	Sean.smith@pennco.org	605-394-2166 (o) 605-939-1372 (m)
Josh Lietz	Highway Project Manager	Pennington County Highway Department	Josh.lietz@pennco.org	605-394-2166 (o) 605-786-5286 (m)
Eric Radke	Traffic Operations	Pennington County Highway Department	eric@pennco.org	605-721-1486 (o) 605-431-7613 (m)
Brittney Molitor	Planning Director	Pennington County Planning and Zoning	brittneym@pennco.org	605-394-2186 (o)
Jason Theunissen	Assistant Planning Director	Pennington County Planning and Zoning	Jason.theunissen@pennco.org	605-394-2186 (o)
Kip Harrington	Planner / Director	Rapid City Area MPO	Kip.harrington@rcgov.org	605-394-4120 (o)
Steve Grabill	Project Manager	KLJ Engineering	Steve.grabill@kljeng.com	605-787-2486 (m)
Shawn Mayfield	Structural Engineer	KLJ Engineering	Sean.mayfield@kljeng.com	605-872-5017 (o)
Oz Kahn	Traffic Engineer	KLJ Engineering	Oz.khan@kljeng.com	651-726-5036 (o)
Neil Putnam	Community Planner	KLJ Engineering	Neil.putnam@kljeng.com	605-550-8081 (o)
Ian Butler-Severson	Transportation Planner	KLJ Engineering	ian.severson@kljeng.com	651-726-5032 (o)

AGENDA ITEM 1:

Meeting started on time at 1pm MST.

- Steve Grabill started introductions and all participants introduced themselves.
- Steve noted meeting duration would be from 1-3pm MST.

AGENDA ITEM 2: Discuss Study Expectations**a. Complete list of TRANSPORTATION ISSUES****GENERAL TRANSPORTATION ISSUES/CONSIDERATIONS:**

Steve asked group to address project expectations.

Joe Miller, Jason Theunissen and other PC staff stated a lot has changed in past 3 years:

- Increase in residents from out of state/outside region.
- B-21 Raider addition at Ellsworth AFB
- Board of County Commissioners wants a plan for infrastructure and Planning from a 3rd party.
- Noted the high pace of growth, influx of new residents, need strategic plans to help show/guide where growth can and will occur.
- Needed infrastructure - Provide framework for growth for next 20-30 years.
- Growth and Development concerns in the following areas:
 - 1416
 - Radar Hill
 - Apple Valley – Localized TIS
 - Old Hill City Rd and Neck Yoke – lots of development
- Do not want to be a Mini-Denver, Topography challenges, \$800K to \$1M houses.
- Commission listens to County Hwy Department but the public is more in need of persuasion.

Brittney Molitor: Hwy 44; development is occurring to the south and east; Radar Hill, Old Hill City Rd.

- Development is occurring to the south and east.
- Comp plan recently done, and some new ordinances, including Ordinance 14.

Comp Plan Amendment

- Comp Plan needs updating.

Kip Harrington mentioned major points for MTP:

- MPO major street plan for Rapid City needs to coordinate with the Co. MTP
- May need to adjust boundaries, sharing data with firms, possibly some reclassifications.
- Road Classifications and alignments need to match up between MPO and Co. Plans
 - Rapid City Major Streets Plan kicks off soon.
 - Dunsmore area classification
- DOT standards, project MPO models do not include Raider project (4,000 to 5,000 new residents)

Discussion continued that the MTP is a “multi-modal” plan and maps were displayed from the previous MTP for pike/bed network needs. What bike/ped projects should be considered for this MTP? The following points were discussed for the various modes of travel.

BIKE/PED:

- Maintenance of any new facilities is a concern both by Co. and residents.
- Omaha and Campbell (TAP project) resulted in new facilities along those corridors.
- Combined use multi-use paths – the County does not get very involved with building separated paths.
- Not a big “bike to work” community within the rural county.
- Rochford Rd. (4 ft. shoulders)
- Should the plan denote any roadways that have existing 4 ft. shoulders? KLJ intends to do this.
- Joe mentioned most bikers are using major roads/interstate for long distance recreation uses.
- Kip has not heard much feedback on shared use paths/bike route regarding Radar Hill area.
- Higher need for bike/ped facilities in the urban and developed areas.

UTV / ATV:

- Users are traveling on the county road system to access trail heads for recreational use.
- Hill City has highly active UTV usage/activity
 - County uses MgCl for dust control.
- KLJ will try to obtain trail locations and facilities from the Forest Service and document within the MTP.

FREIGHT:

- Nemo Road – MTPC Trucks hauling from gravel pits.
- 1416 old dominion hub
- Dias (spelling) Ave – Gravel pit
- Western (off of Longview)
- J&J
- Plastics (Industrial Area) freight
- Old Folsom
- Gravel Pit in Mead Co. – big truck t
- Boxelder dump / 51st? 51?
- Jason – Truck traffic should ideally use Hwy 79.
- Iron Ore mine in Lawrence Co
- Gravel Pit in Meade Co
- Old Folsom possible industrial area
- Want/need for designating haul roads.
- Rubble Site near Box Elder
- It was requested that Pennington County (PC) provide truck count data if they have any.

PRAIRIE HILLS TRANSIT:

- No budget for extending transit routes.
- No funding for Transit outside RC city limits
 - Not cost effective to run transit to airport.
- Prairie Hills provides some transit outside of Rapid City Limits
- Black Hills Works (last mile type transit services)

SCHOOL BUS ROUTES:

- Requested by KLJ

AIRPORT:

- Rapid City Regional Airport, Black Hills growing, need to coordinate with their plans.

PAVEMENT MANAGEMENT/CONDITIONS INVENTORY REPORT:

- County Pavement Conditions Index and Budget model for future maintenance budget/plans
- Average score of 87 (network wide)
- Pavement Conditions study completed, KLJ requested a copy.
- Road Districts are common.
- Need to show future developments.
- Several platting jurisdictions in cities in PC
 - Underwood
 - Hermosa
 - Boxelder
 - Hill City
 - *Rapid City
 - Rapid City: Platting jurisdiction is w/in 3-mile zoning district for standards – (Communications, routing, etc.)

GRAVEL ROADS:

- What is the catalyst for triggering upgrades to [gravel] roadways?
 - Comp Plan: Gravel roads at or approaching the 250 ADT threshold may be candidates for paving.
 - Having accurate O/D data and maps would help Co. with their process for prompting approval/validating road upgrades.
 - 5-year model
- Ordinance 14 – reports a 250 ADT on certain gravel roads. KLJ and Co. will use for informing new road classifications where needed.
- Development based.
 - Need to identify future developments.
 - May start chip sealing new development in lieu of pavement.
- Dust concerns on roads near/around Wall
- Joe noted that 50% of the PC road network is gravel.

Steve asked: For base maps, how is best to inventory any new roads that are being upgraded from gravel to paved (chip seal)?

- Joseph stated 15 miles slated to be upgraded in 2023 season.
- Need inventory of proposed development to forecast future road maintenance and upgrades.
- County GIS data would be helpful and will be provided to KLJ.
- Eric Radke stated that ADT spikes during summer seasonal/tourism.
- Eastern and Western parts of county have the most gravel roads and issues.

FARM TO MARKET ROADS:

There are multiple large ranches that generate Agricultural/Ranching based traffic/activity. The county staff noted the following:

- Creighton Road
- Quinn Road / Pedro Road
- Sage Creek / Sage Brush
- Baseline
- 233rd

AGENDA ITEM 3: Review Proposed Approach from KLJ Proposal

a. Task 1 (i) Baseline Conditions Analysis

Traffic Count Cycles

- County conducts counts every 1, 3 and 6 years, depending on the corridor.
- Bridge counts every 10 years.
- Steve requested County's existing traffic count data. County to provide previous counts to KLJ.
- 15 intersection counts will be conducted by KLJ. Joe said it would be most beneficial for KLJ to select intersections for 15 traffic counts that will be performed. Locations will need to be determined in coordination w/ County.
- Timeline: 1st three weeks in May (May to September is peak tourist season)
 - Schools: Rapid Valley and Sheridan Lake
 - Most counts to be in Rapid Valley area.
 - Avoid New Underwood traffic counts.
- Joe said the new solar panel plant/project (New Underwood) could throw off counts, with lots of truck traffic (161 from the south)

Internet survey using Social Pinpoint

- Steve discussed internet survey using Social Pinpoint for obtaining public input. SAT agreed on platform for public comment.

StreetLight Data to assess Origin-Destination Data

- Steve asked SAT to consider where O/D locations would be most relevant for analysis.
- Joe: Rapid Valley (Moon Meadows) is a prime area to focus for O/D streetlight data.
- Streetlight data will be used to A/B w/traffic count data.
- New Underwood Road was discussed as an O/D example on how Streetlight data is valuable for ADT/Planning/Etc.

b. Task 2: Standards Development

Functional Classification System Updates

- County Road Jurisdiction (RJ) and Functional Classification (FC) should be congruent with MPO FC within the MPO jurisdictional area, and congruent with SDDOT outside of the MPO area.
- Steve requested Functional Classifications (FC) in GIS format.
- Ian Butler Severson requested list of Conflict roads i.e., Jurisdiction and/or functional class conflicts.
- County staff mentioned the following roads as notable jurisdiction/functional class “conflict” roadways.
 - Boundary Road
 - Country Road
 - City Annexed Roads

Typical sections, Access Standards, Level of Service (LOS)

- Access Standards – County Follows SDDOT
- Ord 14, LOS – any road that is paved will receive full maintenance.
 - Gravel roads, based on area population, receives scaled back maintenance plans/program.

Brittney – commented that development issues/opportunities are typically subjective (e.g., based on a number of issues/project attributes, degree of stakeholder opposition, development of utility services, etc.)

c. Task 3: Future Needs Analysis

2030 and 2045 MPO model results

- through 2030 for short range
- through 2045 for long-range
- MPO: 2025 will be the next MTP.
- Any new “public road” is changed into a “road district” and is privately levied based on residents’ usage of that road and who are a part of the “road district.”

Traffic Growth Factors

- Inside MPO – use the model.
 - 3.2% growth for Rapid city from 2022-2023
 - Question is: how long will this “high” growth rate continue and at what rate?
- Outside MPO – Use standard growth factor.
 - PC – 2% growth factor.
 - Growth Projections need to be revisited due to: Pandemic; B-21 Raider at AFB.
- Steve requested existing and/or new traffic studies that KLJ may not currently have.
- Large landowners could/should be inventoried to help with forecasting need for upgrading or new road construction.

AM Peak, PM Peak and V/C ratios along key routes.

- Key routes will coincide with 15 traffic count locations.

ID roadway, geometric, right of way, and other deficiencies (2030 & 2045)

- This item was not discussed.

ID airport, transit, freight, pedestrian, and bicycle future needs

- Joe stated County is not interested in bike paths in county; is a maintenance/jurisdiction issue.
- near RC, shoulders another concern.
 - 2' Shoulders Rockhead
 - 4' Shoulders Sheridan Rd.

d. Task 4: ROADWAY (and DATA) MANAGEMENT SYSTEM:

- Steve asked question how best to approach and who to work with on the data management side. KLJ will work primarily with Eric Radke with coordination with other County staff.
- Main "hub" for county data is currently *Pub Works* (PubWorks, an SQL based system)
- Co. would support Oglala Sioux Tribe efforts to obtain grant funding and to reconstruct the Scenic Road project if Tribe and/or federal funding were able to fund most of the project.

e. Task 5: Final Report

- This item was not discussed.

f. Task 6: Public Meetings

- Proposed tentative date of June 15th.
- Need to coordinate and pick dates/times; Question to hold separate meeting or piggyback w/ resolution. Differing needs for the following cities:
 - Wall (standalone meeting)
 - Hill City (Standalone meeting)
 - Rapid City (combined w/ resolution meeting)
 - Resolution will be addressed in all three locations. It was suggested that if the MTP Public.
 - Rapid City Meeting could be held together with county resolution meeting.
- Monthly Status Report is sent out to the PC Commissioners from the Highway Department on the 1st of the Month.
- Stakeholder Meetings
 - Stakeholder meetings will be concurrent with public meetings as needed. KLJ will contact the Forest Service regarding trails, and other key stakeholders within the County.
 - Website: This item was not discussed. It is assumed that KLJ will prepare a project website that will be linked to City, County and SDDOT websites.
 - PC updates to be provided from submitted monthly status reports.
 - Internet Based Survey – Social Pinpoint is appropriate for study use.

g. Previous Studies

Previous studies that KLJ has already obtained:

- Ordinance 14
- Comp Plan and Amendment
- MPO MTP

Previous studies requested by KLJ for review/incorporation into MTP:

- Traffic Studies
 - Alpha Omega Traffic Study
- Any plans that may have recent demographic forecasts.
- Twilight
- Sheridan
- Universal Road
- Zoning and Development--- this report will help in reviewing proposals.

Oz Khan: Requested a list projects from previous plans that have been implemented, are still pending, or have been eliminated. Sean Smith will work on inventorying previously identified projects and providing current status.

AGENDA ITEM 4. Study Schedule

- Scheduling in July, watch for BOCC meetings, Resolution update underway.
- Monthly updates to the BOCC
- Who are the stakeholders for meetings?
- Steve asked if it could be approved to extend the existing proposed schedule out 2 months to May 2024. No objections to extending the schedule.
- a. Tentatively Schedule Public Meeting 1 (June 15?)
- b. Tentatively Schedule SAT Meeting 2 (July 18?)

AGENDA ITEM 5. Adjournment

- **Eric (PC):** requested KLJ make a list of GIS layer/shapefile needs, for the County to send to KLJ.
- The meeting ended on schedule at 3pm MST.

ATTENDANCE LIST



Pennington County Master Transportation Plan

Tuesday, April 11, 2023 SAT Meeting 1

Name	Email Address
Steve Grabill	steve.grabill@KLJeng.com
Neil Putnam	neil.putnam@KLJeng.com
Ian Butler-Severson	ian.severson@KLJeng.com
Oz Khan	oz.khan@kljeng.com oz.khan@kljeng.com
Shawn Mayfield	shawn.mayfield@kljeng.com
Eric Radke	ericr@pennco.org
JOE MILLER	JOE.MILLER@PENNCO.ORG
SEAN SMITH	Sean.Smith@pennco.org
JASON THOMASSON	JASON.THOMASSON@PENNCO.ORG
Kip Harrington	Kip.harrington@rcgdu.org
JOCH LIETZ	joch.lietz@pennco.org
Brittney Molitor	brittney.m@pennco.org

Pennington County
Master Transportation Plan
Study Advisory Team Meeting 2 (SAT2)
July 20, 2023
10:00 A.M. - 12:00 P.M. MST
11:00 A.M. - 1:00 P.M. CDT

Minutes

Meeting Attendance:

Name	Title	Organization	Email	Phone
Joseph Miller	Highway Superintendent	Pennington County Highway Department	Joe.miller@pennco.org	605-394-2166 (o) 605-391-9370 (m)
Sean Smith	Asst. Highway Superintendent	Pennington County Highway Department	Sean.smith@pennco.org	605-394-2166 (o) 605-939-1372 (m)
Josh Lietz	Highway Project Manager	Pennington County Highway Department	Josh.lietz@pennco.org	605-394-2166 (o) 605-786-5286 (m)
Eric Radke	Traffic Operations	Pennington County Highway Department	eric@pennco.org	605-721-1486 (o) 605-431-7613 (m)
Brittney Molitor	Planning Director	Pennington County Planning and Zoning	brittneym@pennco.org	605-394-2186 (o)
Jason Theunissen	Assistant Planning Director	Pennington County Planning and Zoning	Jason.theunissen@pennco.org	605-394-2186 (o)
Kip Harrington	Planner / Director	Rapid City Area MPO	Kip.harrington@rcgov.org	605-394-4120 (o)
Steve Grabill	Project Manager	KLJ Engineering	Steve.grabill@kljeng.com	605-787-2486 (m)
Oz Kahn	Traffic Engineer	KLJ Engineering	Oz.khan@kljeng.com	651-726-5036 (o)

Ian Butler-Severson	Transportation Planner	KLJ Engineering	ian.severson@kljeng.com	651-726-5032 (o)
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AGENDA ITEM 1: Welcome & Introductions

Meeting started on time at 11am CDT/10am MST.

- Steve Grabill started introductions and all participants introduced themselves.
- Steve noted meeting duration would be from 10am to noon MST.

AGENDA ITEM 2: Study Schedule

Steve reviewed the study schedule w/ the SAT members. No adjustments to schedule were determined to be required.

- Tentatively Scheduled SAT Meeting 3 for October 10-12
 - Preference for October 11th at noon CST / 1pm MST
- Tentatively Scheduled Public Input Meeting (PIM) 2 for January 2024. Discussed potential logistic issues if adverse weather conditions were to arise. The hope is that the public will use one of many options to provide input.
- Baseline conditions report to be delivered soon, pending receipt of Existing and Future land use to be provided by County Planning/Rapid City GIS dept.

AGENDA ITEM 3: Baseline Conditions

1. Baseline Conditions

a. Population / Trends were reviewed by KLJ

- Future Growth Areas were reviewed by KLJ (MPO's model for growth projections to 2045 are incorporated and may be supplemented by County growth factors)
- County Staff noted some additional growth areas:
 - Red Rock (a couple hundred new homes)
 - Rapid Valley east of Airport
 - Black Gap
 - Box Elder
 - Hill City

b. Roadway

County and KLJ discussed Rapid Valley to Radar Hill Road and potential/viability of new connector route.

- Jurisdictional Ownership - existing conditions were reviewed
- Functional Classification - Discussion of how functional class should be defined by road type i.e., the presence of "curb and gutter" as a functional class determination factor, especially for "urban" roads.
 - Longview East (revise functional classification)
 - Country Rd. (revise functional classification)
- Number of Lanes Inventory was reviewed by KLJ

- iv. Roadway Surface Types was reviewed by KLJ
- v. Roadway Surface and Pavement Management - KLJ and County discussed including paving threshold recommendations in the MTP:
 - 1. Set “Gravel to Pavement” Thresholds based on an AADT of 200-250
 - a. Rochford Road segments are a candidate: to be chip sealed/paved in the future
- c. Bridges and Culverts
 - i. 6 or 7 of 19 existing structures that are currently rated “poor” are currently in process of being upgraded from “Poor” rating
 - ii. 3 additional Federally funded bridges, totaling 10 bridges in next 2 years that will be upgraded from current “poor” rating.
 - 1. County stated that if an existing “poor” rated bridge is currently under contract, to remove it from “poor” rating designation for the MTP report.
- d. Traffic Volumes were reviewed by KLJ. It was noted that counts were updated in January (2020-2023)
 - i. KLJ asked to verify AADT count dates
- e. Traffic Operations - Intersection delays and LOS were reviewed by KLJ and discussion with county for known problem intersections:
 - i. It was noted by KLJ that improving signal timing could help improve LOS at Sheridan Lake Road/Dunsmore.
 - 1. E.B.L. turn lane, skews, and other issues
 - 2. This was identified as a new project for inclusion in the MTP
 - ii. Also noted that the intersection of Concourse/Twilight at North and South bound approaches experience a LOS delay
- f. Crash Safety and Analysis were reviewed by KLJ.
 - i. Areas of high frequency crashes and crash severity (fatal or serious injury) were noted.
- g. Freight infrastructure and modes were reviewed by KLJ.
 - i. It was noted by the County that revisions be made to the Rail lines that service the County as shown by KLJ in the baseline conditions.
- h. Multi-Modal Transportation
 - i. Existing conditions for ATV/UTV Facilities and Usage were reviewed.
 - ii. Non-Motorized Facilities (e.g., existing bike and pedestrian networks, on and off road and trails), were reviewed by KLJ
 - iii. Air Transportation/Transit was briefly reviewed by KLJ. Steve has requested that KLJ’s aviation planner add narrative to the MTP’s baseline conditions sub-chapter for Air Transportation/Transit
 - iv. Transit was briefly reviewed by KLJ. KLJ has mapped the existing Rapid Transit fixed routes (6), and KLJ took note in communications with RTS that the “school” route has been discontinued.

AGENDA ITEM 4: Goals and Objectives

2. Goals and Objectives were briefly reviewed by Steve Grabill for County staff. No changes to proposed goals and objectives were requested.

AGENDA ITEM 5: Issues Identification Discussion

1. Issues Identification Discussion - future needs and next steps were discussed by KLJ w/ County staff SAT members. Joe commented and agreed with KLJ that the primary goal for the MTP is to understand where the development/growth is occurring, and what then are the implications for the road and multi-modal systems. The purpose of the MTP/study is therefore to correlate growth to what the future transportation system needs are.
 - a. Growth areas - KLJ asked/discussed what the drivers for growth have been, e.g., Ellsworth AFB, post pandemic migration/influx, new subdivision growth as a result of new residents and housing needs.
 - b. Roadway
 - i. The county received a dust complaint at Rochford Rd.
 - ii. Brittney Molitor asked: "Where are people going?" KLJ will use Streetlight data as an O/D tool to determine trips/traffic generation and locations to help identify existing and future areas where AADT/traffic volume and LOS needs to be analyzed.
 - c. Freight - no issues were discussed.
 - d. Multi-Modal - consideration for county road shoulder widths to be identified for potential on-road bicyclists.
 - e. Transportation Policy
 - i. ATV/UTV Usage on County Roads
 1. KLJ and County discussed possibility of finding and reviewing relevant UTV/ATV studies that could help to develop a County UTV policy.
 - a. ITE websites/studies for ATV/UTV - i.e., wear and tear on roads and implications for maintenance.
 2. County noted that UTV rental businesses are opening (Hill City) as it is becoming an increasing outdoor motorized on/off road activity.
 3. County staff noted that it may be worth time to locate vacation rental locations in relationship to UTV rentals/usage.
 4. KLJ noted to request traffic counts for UTVs (to be requested from Eric).
 - ii. Gravel to Pavement policy
 1. Thresholds for Gravel to Pavement policy to be set at AADT range of 200-250.
 2. Existing Growth Areas identified.
 3. Anticipated Growth Areas to be further identified.

- iii. Traffic Impact Studies - recommendations will be provided for how traffic impact studies can help developments include road improvements as part of development costs.

AGENDA ITEM 6: PIM #1 Feedback

1. PIM #1 Feedback
 1. Issues Discussion
 2. Website and Social Pinpoint were reviewed by Steve Grabill
 3. Comments Received
 - a. UTV traffic and overloaded trucks have increased, impacting County roads (July data needs?)
 - b. UTV safety along Reno Gulch - curves and no shoulders
 - c. Gravel road conditions/maintenance is an issue (Creighton, Babcock, and Sage Creek roads)
 - d. Rochford Road traffic will increase once paved
 - e. Deerfield and China Gulch Roads are seeing a lot of heavy truck traffic

AGENDA ITEM 7: Next Steps

1. Next Steps / Remaining Tasks Overview were discussed by Steve Grabill and included the following:
 - a. Standards Development
 - i. Functional Classification System Updates
 - ii. 2030 and 2045 County Major Road Plans
 - iii. Master Bicycle and Pedestrian Plan
 - iv. Process and Draft Ordinances
 - v. Typical Sections, Access Standards, Level of Service
 - b. Future Needs Analysis
 - c. SAT 3 Preparation

AGENDA ITEM 8. Adjournment

Task	2023												2024			
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	
Study Advisory Team Meetings			1			2			3		4					
Public & Stakeholder Meetings					1								2			
Baseline Conditions Analysis			█													
Standards Development				█												
Future Needs Analysis						█										
Roadway Management System						█										
Website						█										
Draft Report												█				
Final Report													█			
Anticipated Completion Date																★

Pennington County
 Master Transportation Plan
 Study Advisory Team Meeting 3 (SAT3)
 October 11, 2023
 1:00 P.M. - 2:00 P.M. MST
 2:00 P.M. - 3:00 P.M. CDT

Minutes

Meeting Attendance:

Name	Title	Organization	Email	Phone
Joseph Miller	Highway Superintendent	Pennington County Highway Department	Joe.miller@pennco.org	605-394-2166 (o) 605-391-9370 (m)
Sean Smith	Asst. Highway Superintendent	Pennington County Highway Department	Sean.smith@pennco.org	605-394-2166 (o) 605-939-1372 (m)
Eric Radke	Traffic Operations	Pennington County Highway Department	eric@pennco.org	605-721-1486 (o) 605-431-7613 (m)
Jason Theunissen	Assistant Planning Director	Pennington County Planning and Zoning	Jason.theunissen@pennco.org	605-394-2186 (o)
Brittney Molitor	Planning Director	Pennington County Planning and Zoning	brittneym@pennco.org	605-394-2186 (o)
Sarah Gilkerson	MPO Coordinator	SDDOT	Sarah.Gilkerson@state.sd.us	605-773-3093 (o)
Kip Harrington	Planner / Director	Rapid City Area MPO	Kip.harrington@rcgov.org	605-394-4120 (o)
Dave Wiosna	Planner	KLJ Engineering	David.Wiosna@kljeng.com	701-271-5034 (o)
Shawn Mayfield	Structural Engineer	KLJ Engineering	Shawn.Mayfield@kljeng.com	605-872-5017 (o)
Steve Grabill	Project Manager	KLJ Engineering	Steve.grabill@kljeng.com	605-787-2486 (m)
Ian Butler-Severson	Transportation Planner	KLJ Engineering	ian.severson@kljeng.com	651-726-5032 (o)

AGENDA ITEM 1: Welcome & Introductions

Meeting started on time at 2:00pm CDT/1:00pm MST.

- Steve Grabill started introductions and all participants introduced themselves.
- Steve noted meeting duration would be from 10am to noon MST.

AGENDA ITEM 2: Study Schedule

Steve reviewed the study schedule w/ the SAT members. Steve said the current schedule calls for the draft MTP to be submitted to the SAT around Dec. 1, with the next SAT scheduled for around December 15. He asked County staff to talk it over and let him know if they wanted more time for review of the draft plan. If that is the case, Steve would move the meeting into January. It was noted that December 14 will not work for some SAT members as our next meeting date.

AGENDA ITEM 3: Discussion on Submittal of 1st Four Chapters

Steve noted that some comments had been received and they were incorporated into the first four chapters of the report. No further comments were offered by the SAT.

AGENDA ITEM 4: Functional Classifications

KLJ presented current functional classification maps, as well as how the County's classifications fit FHWA mileage guidelines. KLJ also presented maps that reflected differences between the County Functional Class Maps and those maintained by the SDDOT. Steve said that recommendations regarding differences will be provided in the draft MTP.

Discussion followed regarding the urban vs. rural functional classifications. Sarah said that the urban classifications should pertain to those located within the Urban boundary, which was in the process of being revised. It was agreed that the County would send KLJ the proposed, revised urban boundary, which will be shown in the MTP and highlighted as being preliminary. Urban vs. rural designations will be modified accordingly.

AGENDA ITEM 5: Present Methodology/Findings of County Growth Impacts on Transportation System

Future Growth Areas:

- EAFB has a projected growth of 4,000 by 2042
- Rapid City is growing by 3,000 annually
- 2.3% ADT increase YoY

Pavement Index Report (PCI)

Joe: PCI report is likely not going to change. 5-year plan report is for asphalt conditions.

- The current report is what we have. The PCI data itself is good.
- Waiting for the 5-year plan model
 - Draft pavement conditions report is available
 - KLJ would normally pull the 5-year plan recommendations into the MTP
 - PC is not able to get into the analytical components of the report due to mismatched ID/ref numbers for the Roads system.
 - KLJ will use the information that is available, incorporate into the draft MTP, and PC SAT can redline any needed updates/revisions
 - Take off the gravel roads on the KLJ document
 - Sheridan Lake road PCI rating should be updated as completed to "good"
 - 60th Ave South is all gravel (take off the list)

UTV/ATV use areas:

Are we looking for recommendations for increased signage (signage to notify drivers to be cautious of UTVs, vs. signage for, site distance at crossings/access points, widened shoulders, passing zones, recognizing the use area?)

Joe:

Sheridan lake road is now 32' wide with 6' shoulders

South Rochford rd.

Roads west of 385

UTVs share the road as licensed vehicles, they're a revenue source. Recommendations should be made policy wise about usage on what types of road type...

Rental users are probably driving in closer proximity to Hill City where the rental locations are located.

Sarah G – recommends a strong consideration for updating/increasing signage at trail head locations, crossings, etc., where motorists are interacting with ATV/UTVs. Signage could be at start, mid and end points of roadways where a road facility interacts with motorized trails.

KLJ will reach out to Forest Service for vehicle use map.

Bicycle Facilities – potential project areas

- Radar Hill Road
- 1416
- Sheridan Lake Road
- South Rochford Road
- Longview
- Anderson
- Twilight
 - 3 lanes w/ four-foot shoulders (October / November)
 - Highlight county roads where there is current 4' shoulders

Inquire to SAT/PC Department for an inventory of

- Intersections and LOS
- Steve will be preparing his notes for analysis
- Jolly – queuing issue

AGENDA ITEM 6: Consider Preliminary Projects List

Steve asked whether any extra-territorial new corridors had been discussed within the County.

Area of Concern: Connection of Twilight into the Rapid Valley area leading to Box Elder

- Longview Reservoir
- Dunsmore /Moon meadows area currently experience LOS issues/bottlenecks
- Commercial corridor between airport/radar hill road area, and new growth development. Intermodal connection.

Joe discussed addressing dead end road systems. New subdivisions are having issues with only providing one road outlet

Neckyoke Road

Ranch Road

Alternative accesses

Dead end road systems within the county are a current policy issue

- ROW acquisition or disallow a development to move forward
- MPO Street plan has some authority of approving plans so it is a conflict to the County's transportation system.

KLJ will have another conversation with Kip regarding extra-territorial corridors that may be future impacts to the county system.

Future section line roads –KLJ asked the SAT to send KLJ their information to add to the county road system inventory and maps – not currently on the road resolution but technically they need to be included with the county system.

- Wall area

KLJ needs the minimum maintenance road info as well (should be included with the Future section line roads.

AGENDA ITEM 7: Next Steps

2. Next Steps / Remaining Tasks Overview were discussed by Steve Grabill and included the following:
 - a. Future Needs Analysis and Project(s) Identification
 - b. Standards Development
 - c. Draft Report (December)

AGENDA ITEM 8. Adjournment

Pennington County Master Transportation Plan Study Schedule 

Task	2023												2024		
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
Study Advisory Team Meetings			1			2			3		4				
Public & Stakeholder Meetings					1							2			
Baseline Conditions Analysis			█												
Standards Development				█											
Future Needs Analysis					█										
Roadway Management System					█										
Website					█										
Draft Report											█				
Final Report												█			
Anticipated Completion Date														★	

Pennington County**Master Transportation Plan****Study Advisory Team Meeting 4 (SAT 4)****Location: Pennington County Highway Department and Online****February 7, 2024****9:30 A.M. - 11:30 A.M. MST****10:30 A.M. - 12:30 P.M. CDT****Minutes****Meeting Attendance:**

Name	Title	Organization	Email	Phone
Joseph Miller	Highway Superintendent	Pennington County Highway Department	Joe.miller@pennco.org	605-394-2166 (o) 605-391-9370 (m)
Sean Smith	Asst. Highway Superintendent	Pennington County Highway Department	Sean.smith@pennco.org	605-394-2166 (o) 605-939-1372 (m)
Eric Radke	Traffic Operations	Pennington County Highway Department	ericr@pennco.org	605-721-1486 (o) 605-431-7613 (m)
Jason Theunissen	Assistant Planning Director	Pennington County Planning and Zoning	Jason.theunissen@pennco.org	605-394-2186 (o)
Brittney Molitor	Planning Director	Pennington County Planning and Zoning	brittneym@pennco.org	605-394-2186 (o)
Sarah Gilkerson	MPO Coordinator	SDDOT	Sarah.Gilkerson@state.sd.us	605-773-3093 (o)
Kip Harrington	Planner / Director	Rapid City Area MPO	Kip.harrington@rcgov.org	605-394-4120 (o)
Greg Heitman		FHWA – Pierre SD	Greg.Heitmann@dot.gov	
Steve Grabill	Project Manager	KLJ Engineering	Steve.grabill@kljeng.com	Steve Grabill
Dave Wiosna	Planner	KLJ Engineering	David.Wiosna@kljeng.com	701-271-5034 (o)
Oz Khan	Traffic Engineer / Planner	KLJ Engineering	Oz.Khan@kljeng.com	651-726-5036 (o)
Ian Butler-Severson	Transportation Planner	KLJ Engineering	ian.severson@kljeng.com	651-726-5032 (o)

AGENDA ITEM 1:

1. Welcome and Introductions – Steve Grabill welcomed attendees and self-introductions were made.

AGENDA ITEM 2:

2. Study Schedule
 - a. Steve Grabill went over the project schedule calendar, indicating the project is a little behind schedule.
 - b. Public Input Meetings (PIM 2) Scheduled
 - i. All Meeting are to be held from 5:30 PM to 7:00 PM
 1. March 12, 2024 - PC Commission Chambers
 2. March 13, 2024 - Wall Community Center
 3. March 14, 2024 - Hill City Community Center

AGENDA ITEM 3:

3. Review of Ch. 4 - Study Intersections, Operations, and Safety
 - a. KLJ reviewed the 15 study intersections for their operations, safety, and recommended alternatives. Steve Grabill noted that he observed the 15 intersections in person.
 - b. Concourse Rd & Twilight Dr deteriorates to an overall LOS F by 2045. KLJ recommended a connection be made from Concourse Drive to Jubilee Lane.
 - i. SAT members noted that development proposals have been submitted in the area.
 - c. Crash statistics were briefly summarized.

AGENDA ITEM 4:

4. Review of Ch. 5 - Existing Conditions Summary
 - a. KLJ gave an overview of growth areas and outlined project identification process inputs.
 - b. Functional Class was reviewed with emphasis on the discrepancies between the county's, MPO's, and DOT's classifications.
 - i. Kip Harrington noted that the SDDOT and County functional class will differ.
 - ii. DOT representatives noted that the DOT is to meet with the MPO and then the county will make decisions regarding functional class.
 1. County SAT members said they have not been engaged by the SDDOT regarding functional class changes so far.
 - iii. KLJ will provide Sarah Gilkerson and Kip Harrington with a pdf of the recommendations to be passed on to a working group.
 - c. Gravel road issues were briefly summarized: SAT members asked why Babcock Rd was included on the list of roads with gravel issues. Steve Grabill stated that the impetus to include Babcock Rd came from public input, possibly in Wall, SD.
 - d. The county indicated that there are no anticipated updates to PCI data.
 - e. KLJ briefly summarized freight and UTV/ATV conditions.

- f. KLJ reviewed bicycle and pedestrian conditions. KLJ reiterated that the county has made it clear they are not interested in bike/ped projects. However, where road improvement projects will occur, there exists a potential opportunity to combine projects.
 - i. Kip Harrington noted that there was no significant public input regarding bike/ped facilities for Radar Hill Road. However, there has been interest in the Apple Valley area.
 - ii. County SAT members noted that while bike/ped facilities are welcomed, their cost of construction or maintenance is prohibitive.
- g. Air and Transit was briefly summarized.
 - i. SAT members noted that RTS cannot operate outside city limits due to funding rules.

AGENDA ITEM 5

- 5. Review of Ch. 6 – Transportation Standards
 - a. KLJ reviewed functional class and urban/rural designation again and presented typical sections per County Ordinance 14, noting that no county roads are likely to transition to a 4-lane road. KLJ also summarized LOS, access management, intersection control warrants, turn lanes, traffic impact studies, and policy.
 - b. Functional Classification Recommendations
 - 1. MPO Major Streets Plan / SDDOT FC
 - c. Roadway Surface
 - d. Cross Section Standards
 - 1. Typical Sections
 - e. Roadway Planning Level Capacity
 - f. Level of Service (LOS) Standards
 - 1. Roadway, Intersection, and Ped/Bike
 - g. Access Management
 - h. Intersection Control Warrants
 - i. Turn Lanes
 - j. Traffic Impact Studies
 - k. Transportation Policy and Ordinance Recommendations

AGENDA ITEM 6

- 6. Review of Ch. 7 - Roadway and Data Management System
 - a. KLJ reviewed GIS data that will be shared with the county at the conclusion of the project.

AGENDA ITEM 7

- 7. Review of Ch. 8 - Projects
 - a. Steve Grabill introduced the list of short- and long-range projects with the disclaimer that the short-range list is not financially feasible. He asked the county to vet the projects list and to identify any that could be moved from short range to long range.

- b. KLJ summarized the process of project identification and indicated that projects from CHAPS and the county's 5-year plan were carried forward. Additionally, some of the intersection projects came from the 15 study intersections.
 - i. KLJ showed cost per mile estimates that were used for projects, clarified the various categories, and asked for the county to provide feedback. It was noted that project costs include contingencies for inflation of 15-25%.
- c. KLJ presented the report's 8-year bridge program.
- d. Steve Grabill asked for any questions and comments:
 - i. County SAT members asked if density was factored in areas other than Sheridan Lake Rd for traffic projections. They noted that traffic projections on portions of Sheridan Lake Rd seem too low for 2045 with anticipated development.
 - 1. Steve Grabill indicated that this MTP followed the typical procedure of starting with the MPO's model, then switched to DOT growth factors for areas beyond the MPO planning area.
 - 2. Kip Harrington noted that the area in question should be within the MPO's model area but cautioned that projections can fall short and also offered to re-analyze growth areas to account for additional development if needed.
 - 3. Housing units as an input factor was also offered to bolster traffic projections if the county can provide them.
 - 4. County SAT members noted other areas of development and discussed limitations in water infrastructure possibly limiting development.

AGENDA ITEM 8

- 8. Next Steps
 - a. KLJ encouraged the county to provide feedback and comments on the report before it becomes publicly available.
 - b. KLJ agreed to share spreadsheets of project lists with the county.
 - c. The draft report is to be posted on county, MPO, state, and KLJ websites. Physical copies are to be placed or mailed to the public library, county admin building's commissioner office and to:
 - Pennington County Planning and Zoning*
 - PO BOX 6160 Ste 200 Rapid City*
 - d. The SAT discussed dates for future meetings. It was noted that the draft report can go either to the MPO or county first for review. Potential meeting dates included:
 - i. April 18 for a review of the draft report, during which time the MPO would give a full presentation.
 - ii. Steve Grabill asked if the report should be presented to the county commission between April and June meetings. If KLJ can be ready to present the final report the 1st or 3rd Tuesday in May, that can be scheduled. Meetings run from 9:00 a.m. to 3:30 p.m.. Joe said anywhere in those times could work.
 - iii. June 13 MPO meeting to review final report. This is generally not a presentation.

- e. KLJ offered to provide a revised draft, to be sent in about two weeks, with physical copies available.

The meeting adjourned 10:53 AM MST/11:53 AM CST.

ATTENDANCE LIST	
	
Pennington County Master Transportation Plan	
Wednesday, February 7, 2024 SAT Meeting 4	
Name	Email
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