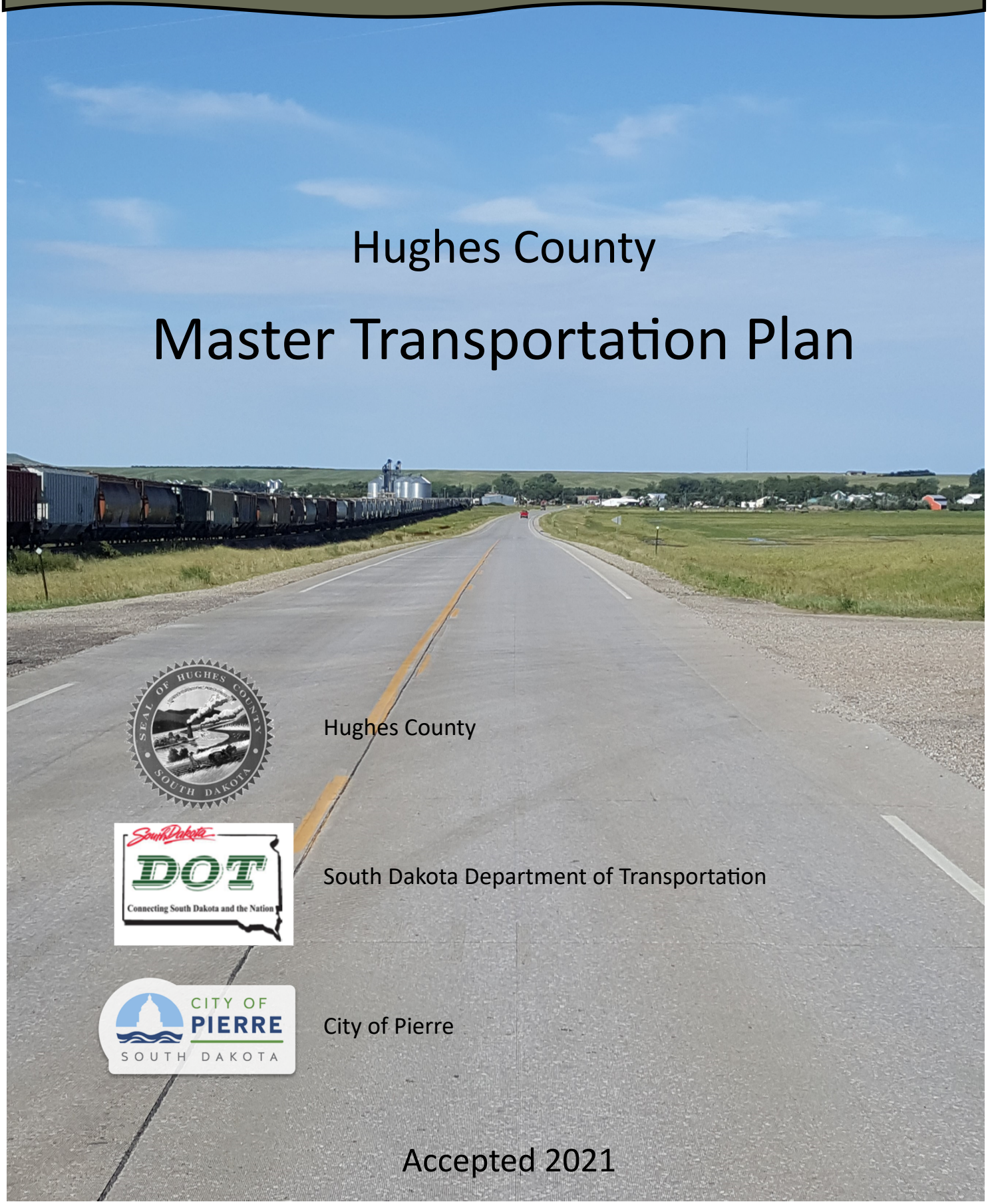
Hughes County

Master Transportation Plan



Hughes County

South Dakota Department of Transportation

City of Pierre

Accepted 2021

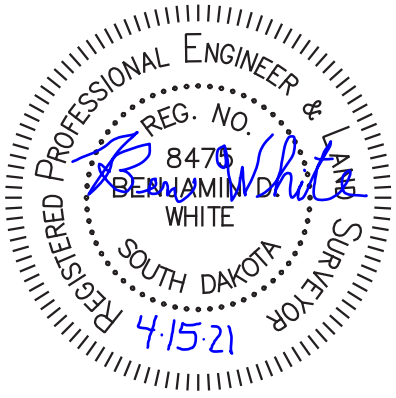
Hughes County
Master Transportation Plan

South Dakota Department of Transportation
Hughes County

HP 5510 (22) P, Function 3616

April 2021

Prepared by: HR Green, Inc.



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 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.

The preparation of this report has been financed through the South Dakota Department of Transportation's SPR Funding for Local Agencies program. The contents and recommendations of this report do not necessarily reflect official views, policy, or endorsement of the South Dakota Department of Transportation.

ACKNOWLEDGEMENTS

Project Managers

Steve Gramm
Planning Engineer
South Dakota Department of Transportation

Kevin Hipple
Hughes County Manager

Study Advisory Team

Steve Gramm – South Dakota Department of Transportation
Jeff Brosz – South Dakota Department of Transportation
Dean VanDeWeile – South Dakota Department of Transportation
Tammy Williams – South Dakota Department of Transportation
Roger Inman – Hughes County Commission
Kevin Hipple – Hughes County Manager
Mike Meyer – Hughes County Highway Department
Robin Brunmeier – Hughes County Highway Department
Eric Booth – Hughes County Planning & Zoning
Rob Fines – Hughes County Emergency Management
Darin Johnson – Hughes County Sheriff
Jane Naylor – Hughes County Finance
John Childs – City of Pierre
Sharon Pruess – City of Pierre

HR Green, Inc.

Ben White – Consultant Project Manager
Rick Laughlin
Matt Brua

Table of Contents

List of Appendices

List of Figures

List of Charts

List of Tables

Executive Summary

The purpose of the Hughes County Master Transportation Plan is to examine the existing transportation network throughout Hughes County and provide a framework by which Hughes County will be able to prioritize, select, and implement improvements to the transportation network over the next 20+ years. It is intended to be a living document, serving as a road map to help guide elected and appointed officials, developers, and residents as Hughes County continues to expand economic and residential opportunities for County residents. This plan provides the flexibility to react to changing conditions and shifts in the County's transportation needs as they arise. Ultimately, this Master Transportation Plan provides solutions to address existing and future transportation challenges while promoting a livable community that will enhance the economic and social well-being of Hughes County residents.

At the onset of the study, the study team solicited stakeholder and public input to help identify transportation needs through a review of the current and future transportation network. Five individual 'plans' were developed to address the identified needs, providing a systematic approach to the planning, prioritization, and implementation of future transportation projects. A Roadway Design, Analysis, and Policy Guidelines chapter was developed to supplement these plans and establish formal design and analysis guidelines for future projects and the evaluation of anticipated impacts.

Hughes County Transportation Network Needs

- Bridge Condition
- Roadway Surfacing
- Multi-Modal Accommodations

The first plan, entitled the Major Roads Plan, establishes a prioritized framework for Hughes County-jurisdiction highways. Through the identification of countywide priorities and assessment of network interdependence, ranging from Township roadways to State highways, this Major Roads Plan balances appropriate levels of mobility, access, and freight accommodations within the overarching regional transportation network

Bridges within Hughes County pose a serious challenge to maintaining the existing transportation network. On one hand, bridges are a necessity to span water crossings and facilitate a connected transportation network. On the other hand, bridges are expensive to replace, and complete replacement projects can quickly carve off a large portion of the County's annual transportation budget. The Bridge Plan describes existing conditions and identifies barriers within the network. It then builds upon the prioritization outlined in the Major Roads Plan to look at future-year costs of a comprehensive bridge plan through maintenance, preservation, rehabilitation, replacement, and removal of existing structures. The Bridge Plan is geared towards the transferability of information into the Bridge Improvement Grant (BIG) fund provided by the South Dakota Department of Transportation.

Hughes County Master Transportation Plan Components

1. Introduction and Purpose
2. Existing Conditions
3. Needs Assessment
4. Major Roads Plan
5. Bridge Plan
6. Roadway Preservation & Maintenance Plan
7. Bicycle and Pedestrian Plan
8. Roadway Design, Analysis, & Policy Guidelines
9. Transportation Funding
10. Project Implementation Plan
11. Conclusions and Recommendations

The Roadway Preservation and Maintenance Plan identifies typical preservation and maintenance activities for asphaltic concrete, blotter, and gravel-surfaced roadways within Hughes County. Life cycle costs were developed for each roadway type within the County, facilitating the development of various roadway needs scenarios. One important element of the Roadway Preservation and Maintenance Plan is the investigation of potential roadway surface conversions to more cost-effective solutions, such as the conversion of an existing asphaltic concrete roadway to a blotter or gravel surface, in light of future funding challenges.

A Bicycle and Pedestrian Plan introduces a framework for incorporating multi-modal accommodations into the transportation network. While recognizing the challenges in incorporating wide-scale multi-modal enhancements to a predominantly rural county, the plan does provide recommendations for multi-modal considerations in conjunction with future roadway projects as well as more focused projects in higher-density residential areas.

The Project Implementation Plan provides recommendations of feasible transportation projects that address Hughes County's long-term transportation needs. Projects were categorized as either 'Core Implementation Elements to Maintain Existing Transportation Network', which includes roadway and bridge life-cycle based projects, or 'Transportation Network Enhancement Projects' that focus on enhancing the current network and supplementing the core implementation elements. The core implementation elements were structured in a 20-year planning outlay that includes major investments such as roadway resurfacing, chip seals, bridge replacement, and bridge preservation projects.

One of the more significant challenges to implementing the Master Transportation Plan is availability of transportation funding and the subsequent effect that has on the long-term sustainability of the current network. The Transportation Funding chapter ties everything together and provides a sample funding scenario. Annual costs were developed to provide a snapshot of need in Year 1 (2020) and Year 20 (2040). These costs are compared to the forecasted annual funding to help illustrate potential funding shortfalls in the future.

1. Introduction and Purpose

Background

Hughes County has been at the center of events, both figuratively and literally, for centuries. On the route of Lewis and Clark, the area quickly became a trading center on the Missouri River. When the State of South Dakota was established, the capital city, Pierre, was set in Hughes County. Now Hughes County hosts not only state government, but also world-class sporting opportunities and highly productive agriculture.

Transportation needs in the Hughes County area have traditionally centered on local work and school trips, truck and rail trips in support of agriculture businesses, and commuting trips, particularly to Pierre. County roadways also serve recreational users and regional travel.

Hughes County has experienced a steady growth in population over the decades, thanks to growth within the City of Pierre. The population of the portion of the county outside of Pierre has risen and fallen, although the period since 1990 has seen growth in the suburban area around Pierre and in developments near the Missouri River. Population figures for Hughes County, the City of Pierre, and the State of South Dakota are shown in **Table 1**.

Table 1: Existing Hughes County Population Trends

YEAR	HUGHES COUNTY	CITY OF PIERRE	COUNTY - PIERRE	STATE OF S D
1880	268		268	98,268
1890	5,044	3,235	1,809	348,600
1900	3,684	2,306	1,378	401,570
1910	6,271	3,656	2,615	583,888
1920	5,711	3,209	2,502	636,547
1930	7,009	3,659	3,350	692,849
1940	6,624	4,322	2,302	642,961
1950	8,111	5,715	2,396	652,740
1960	12,725	10,088	2,637	680,514
1970	11,632	9,699	1,933	665,507
1980	14,220	11,973	2,247	690,768
1990	14,817	12,906	1,911	696,004
2000	16.481	13,876	2,605	754,844
2010	17,022	13,646	3,376	814,180

Source: United States Census Bureau

Like many counties throughout South Dakota, Hughes County is feeling the constraints of maintaining their current system with relatively stagnant highway and bridge funding and continually increasing construction and material costs. Though additional funding and grant opportunities were established for counties in the 2015 Highway Funding Bill, maintaining the existing infrastructure to the level of service users have grown accustomed to is a daunting task. Implementing network enhancements such as improved roadway capacity, safety, network connectivity and route continuity becomes even more difficult when the cost to maintain the existing transportation network exhausts available funding.

Hughes County Master Transportation Plan Introduction

The Study Area for the Hughes County Master Transportation Plan encompasses all of Hughes County including the municipalities of Hughes County. The primary focus is the Hughes County-jurisdiction highway system, but all roadways within the Study Area are included to provide a comprehensive view of the Hughes County transportation network. Additionally, the Master Transportation Plan promotes a multi-modal approach to address issues and needs of all transportation users. The Study Area and associated roadways are illustrated in **Figure 1**.

Master Transportation Plan Purpose and Goals

The purpose of the study is to examine the Hughes County transportation network from a multi-modal perspective and develop a series of prioritized solutions to address safety, infrastructure, and operations needs that will promote a livable community and enhance the economic and social well-being of Hughes County residents.

This Hughes County Master Transportation Plan is intended to be a living document that can be used as a blueprint or 'road map' to help guide elected and appointed officials, developers, and residents as Hughes County continues to expand economic and residential opportunities over the next 20+ years.

Study Process

The Hughes County Master Transportation Plan followed a three-phase study process over the course of a year, described in **Table 2**, beginning in the fall of 2019. Public and stakeholder involvement was an important element to the plan, beginning with the identification of issues and needs and commencing with the publication of the draft report for review and comment. Over the course of the three phases, individual components of the Master Transportation Plan were developed. The final phase was used to compile all elements of the Plan and prioritize projects for public and stakeholder review.

Table 2: Study Process

Phase 1

- Inventory existing conditions
- Analyze existing and future conditions
- Identify issues, needs, and opportunities
- Initial public and stakeholder involvement opportunity with online transportation needs survey

Phase 2

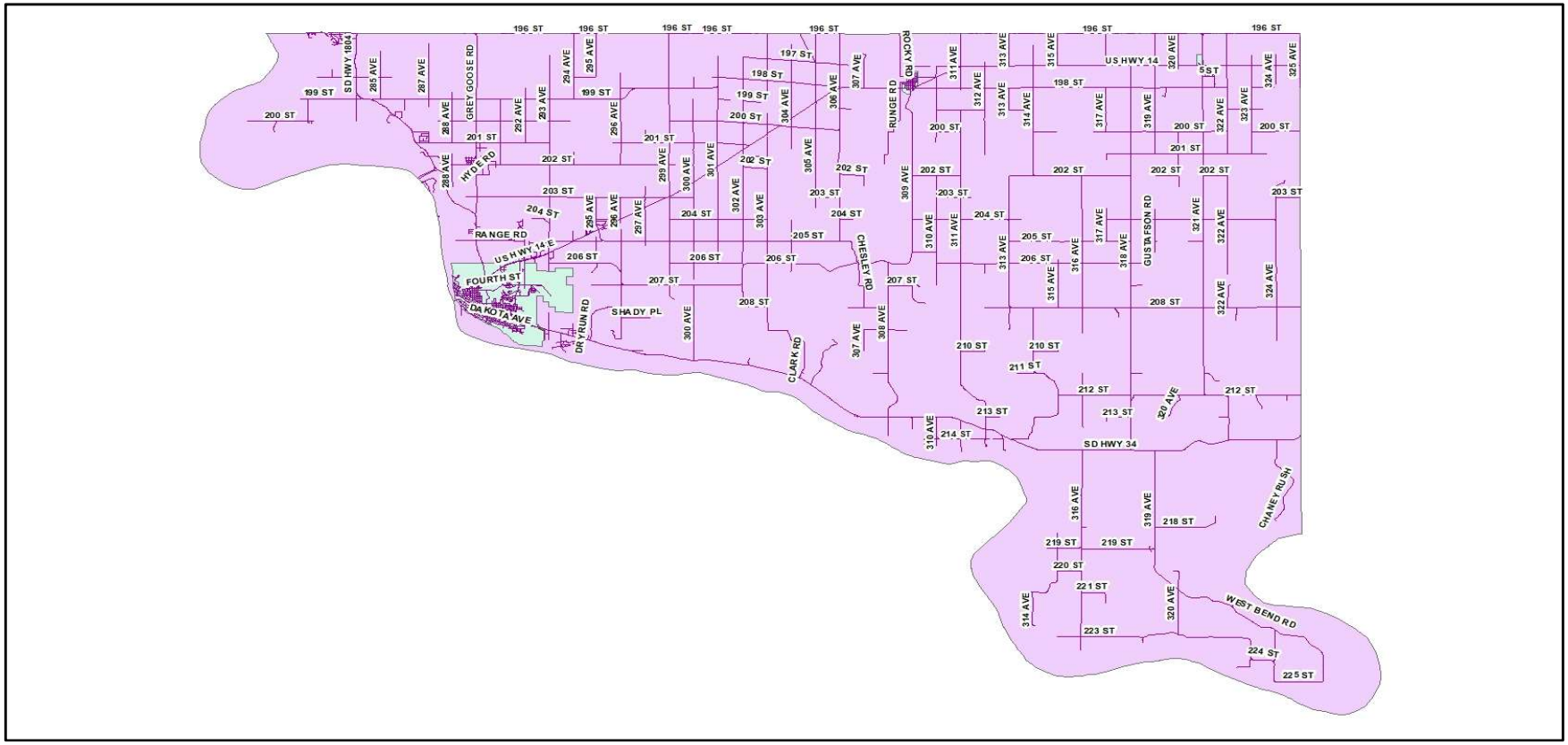
- Develop strategies and solutions to meet community values
- Evaluate potential options

Phase 3

- Select improvement strategies
- Prioritize based on planned investments
- Publish plan
- Draft report public and stakeholder involvement opportunity

Study Guidance (Study Advisory Team)

A Study Advisory Team (SAT), comprised of South Dakota Department of Transportation (SDDOT) and Hughes County staff and elected officials, was organized to help guide the development of the Hughes County Master Transportation Plan. The SAT met several times throughout the study to provide input, feedback, and comments on study progress and materials developed for inclusion in the Master Transportation Plan. The SAT also provided available background data from which transportation system issues and needs were identified and evaluated. Ultimately, the SAT was instrumental in prioritizing study goals, objectives, and the implementation plan that is a culmination of the entire process.



HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 1
STUDY AREA

2. Existing Conditions

Existing conditions for the Hughes County transportation infrastructure were inventoried in order to identify and evaluate transportation-related needs and opportunities. This inventory included a review of the existing roadway network, traffic volumes and operations, crash history, non-motorized transportation facilities, transit service, airport and freight facilities. The following sections summarize the key findings of this review.

Roadway Network

Existing Infrastructure

A network of roads under varying jurisdiction serves Hughes County.

US 14 enters the county on the Missouri River bridge between Ft. Pierre and Pierre and angles northeast to a point 2.5 miles west of Blunt, then turns east to exit the county east of Harrold. US 83 also enters the county on the Missouri River Bridge and runs concurrently with US 14 until it turns north at an intersection 4 miles west of Blunt. It exits the county northwest of Blunt. The US designated roadways are owned and maintained by SDDOT.

South Dakota Highway 34 enters the county on the Missouri River Bridge, runs southeast along the Missouri River, and exits the county approximately 35 miles east of Pierre. South Dakota Highway 1804 intersects US 14 in northern Pierre and extends north along the Missouri River to exit the county approximately 15 miles north of Pierre. South Dakota Highway 204 is a short connector roadway across the Oahe Dam north of Pierre. The South Dakota designated roadways are owned and maintained by SDDOT.

There are four segments of paved rural roadways on the Hughes County highway system:

- Grey Goose Road – intersecting SD 1804, 3.5 miles north of Pierre and extending 8 miles north to the county line.
- 293rd Avenue (Beastrom Road) – intersecting US 14 east of Pierre and extending north 3 miles, where it transitions to gravel surfacing.
- West Bend Road – intersecting SD 34 about 28 miles east of Pierre and extending south to the West Bend Recreation Area where it transitions to gravel surfacing.
- Spring Creek Road (196th Street) – west from SD 1804 to Corps of Engineers take line at Lake Oahe.

The remaining 564 miles of county highways are either gravel surfaced or chip seal surfaced. A few subdivision roads are also maintained by the county and are either gravel or chip seal surfaced.

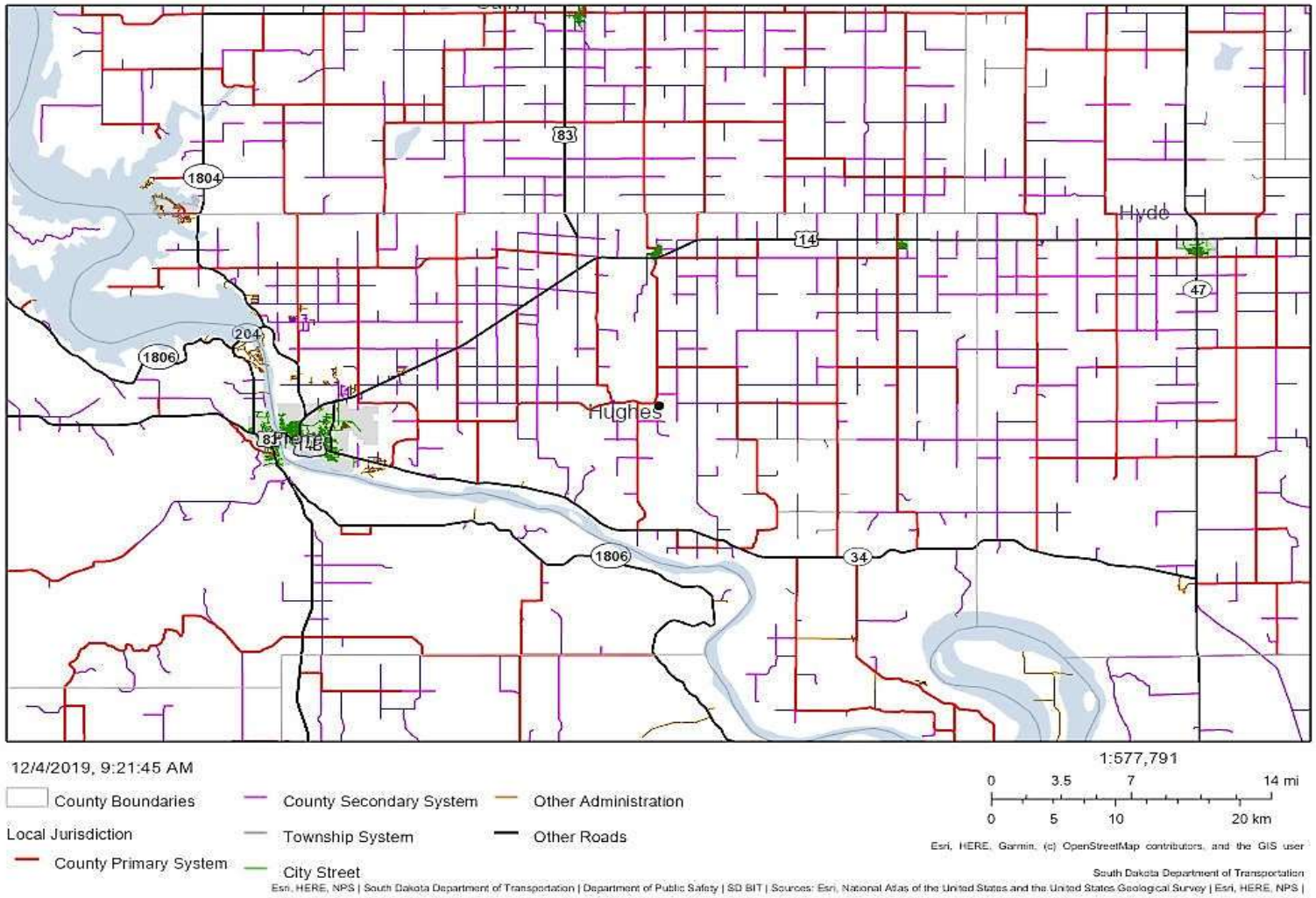
County Highway Classification

The county highway system is classified as follows:

- County Highway System Roads – well-maintained and top priority for snow removal.
- County Secondary Roads:
    - Standard Maintenance Roads – maintained at a level higher than minimum standards and second level on snow removal.
    - Minimum Maintenance Roads – maintained below minimum standards at levels required for intermittent traffic. Maintenance and snow removal as deemed necessary and as time and funding permit.

The classification of the Hughes County roadway network is shown in **Figure 2**.

Figure 2 - Highway System Classification

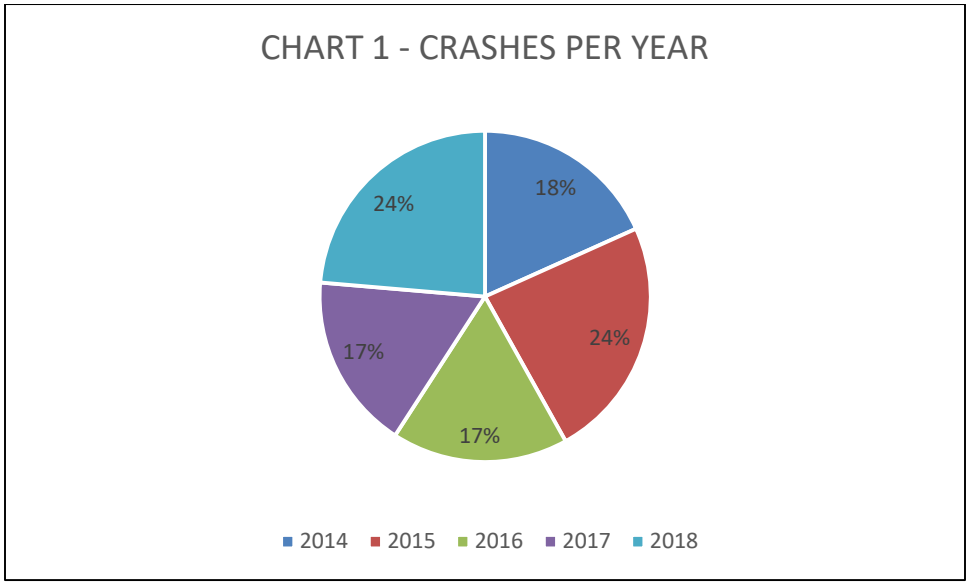


HRGreen	**HUGHES COUNTY MASTER TRANSPORTATION PLAN**	**FIGURE 2 HIGHWAY SYSTEM CLASSIFICATION**

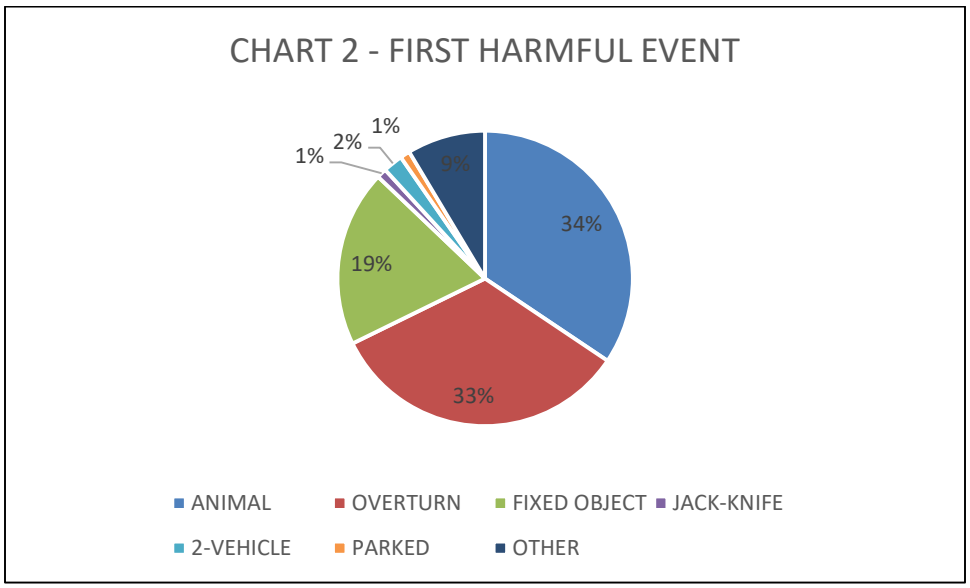
Existing Roadway Safety Review

Crash statistics for the years 2014-2018 were analyzed to identify locations that may need safety improvements and to establish crash trends on the Hughes County highway system.

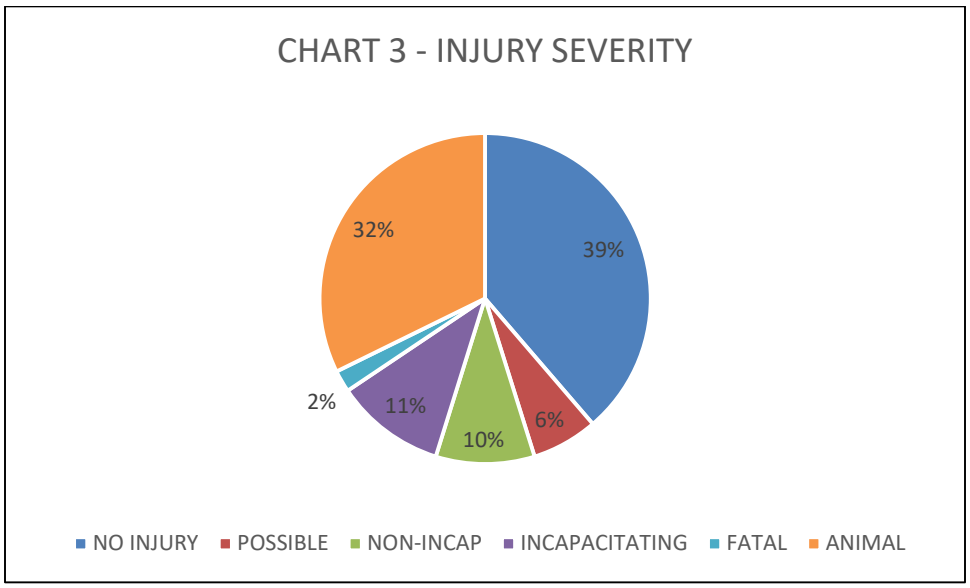
A map of crash locations, **Figure 3**, shows that the majority of crashes in Hughes County occur on the high-volume state highways. Crashes on county highways are much more scattered and less frequent. The prevalent type of crash on county highways involves a single vehicle either striking a deer or running off the road. There were no locations that appeared to represent a concentration of crashes on the county system.



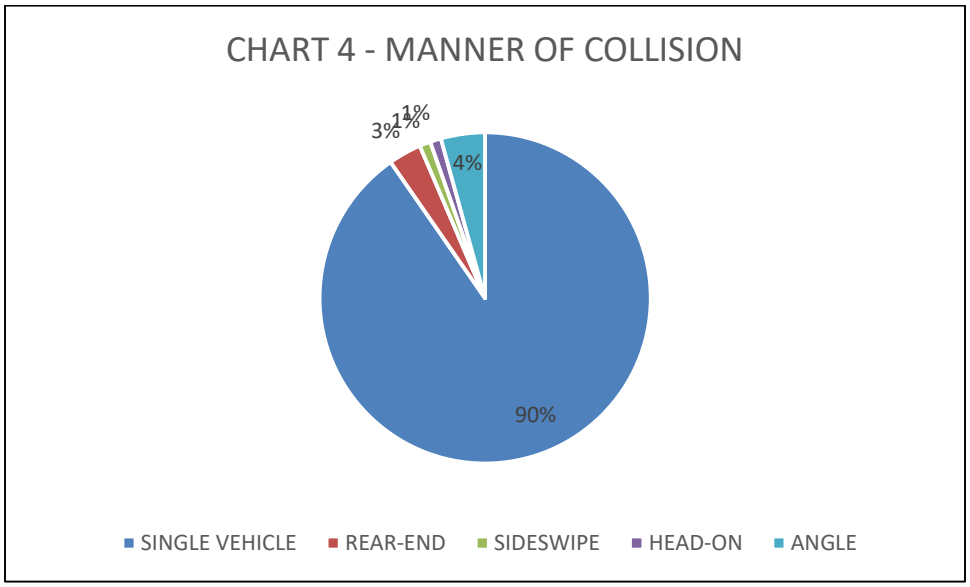
First Harmful Event – Animal collisions were the most prevalent crash type, followed by overturning and striking a fixed object (**Chart 2**).



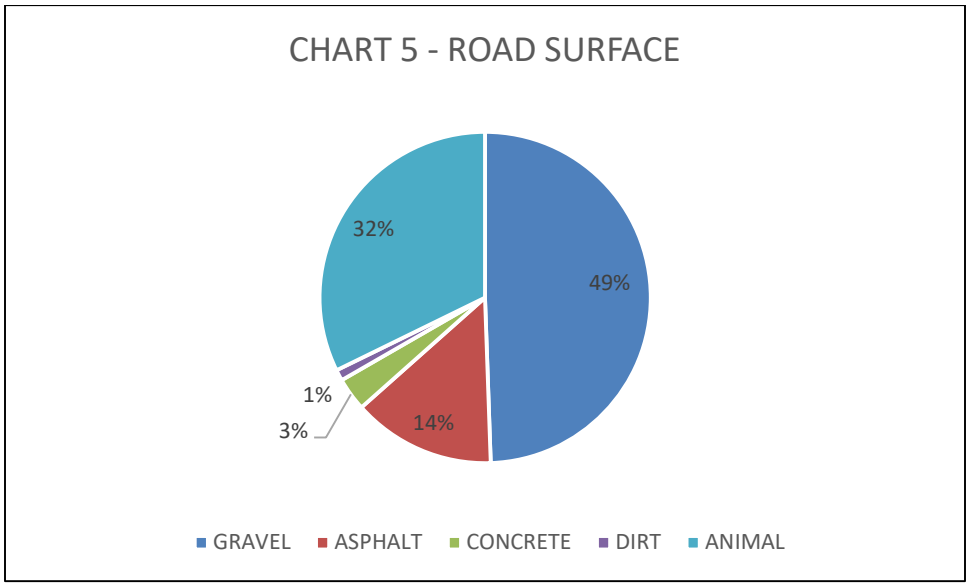
Injury Severity – Crashes most frequently involved no injuries, with the second-most frequent group involving injuries to an animal only (**Chart 3**).



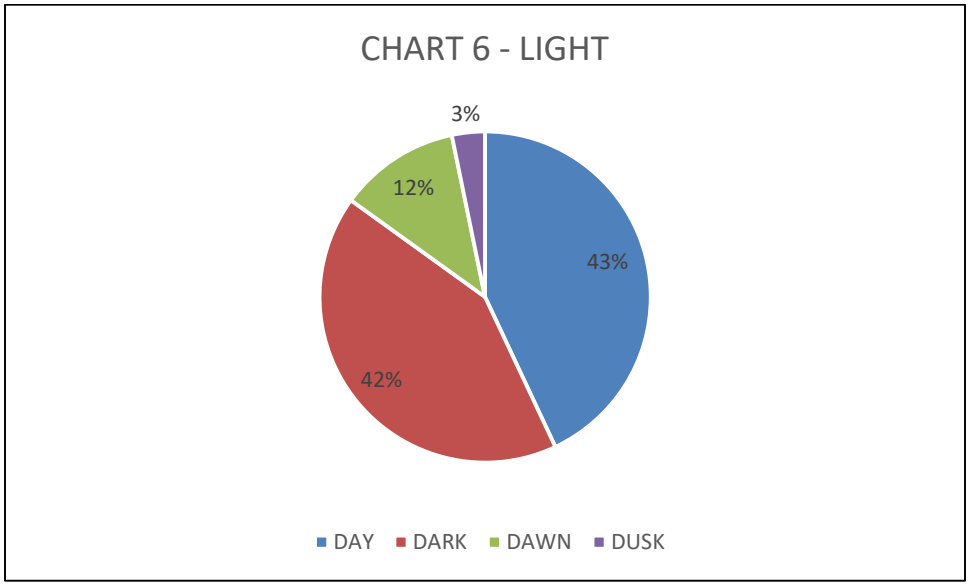
Manner of Collision – Ninety percent of the crashes on the Hughes County system involved a single vehicle (**Chart 4**).



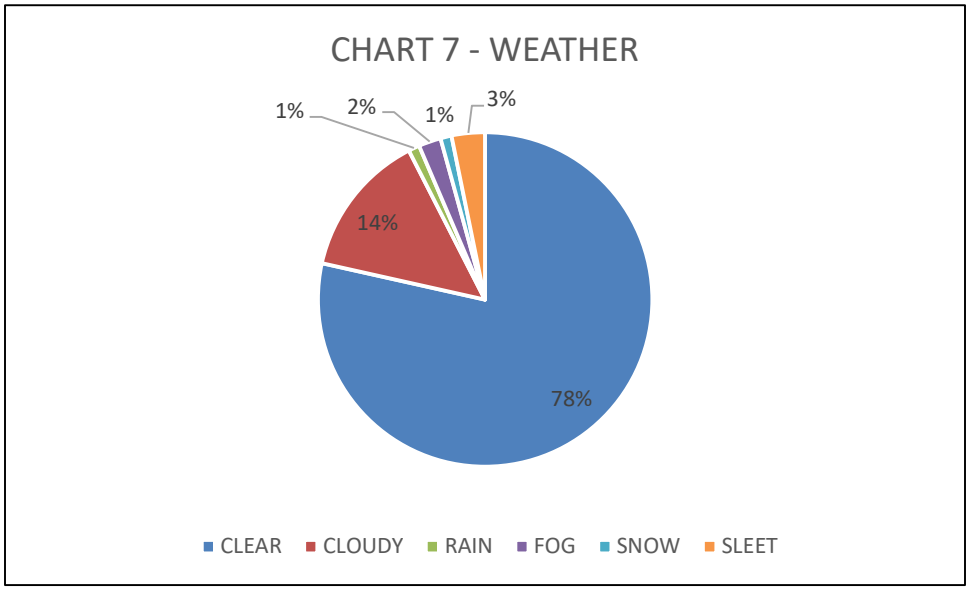
Road Surface – The majority of crashes occurred on a gravel road (**Chart 5**). Note that South Dakota crash records allow entry of "animal" in this field to override the road surface type. Most of the crashes entered as "animal" occurred on gravel-surfaced roads.



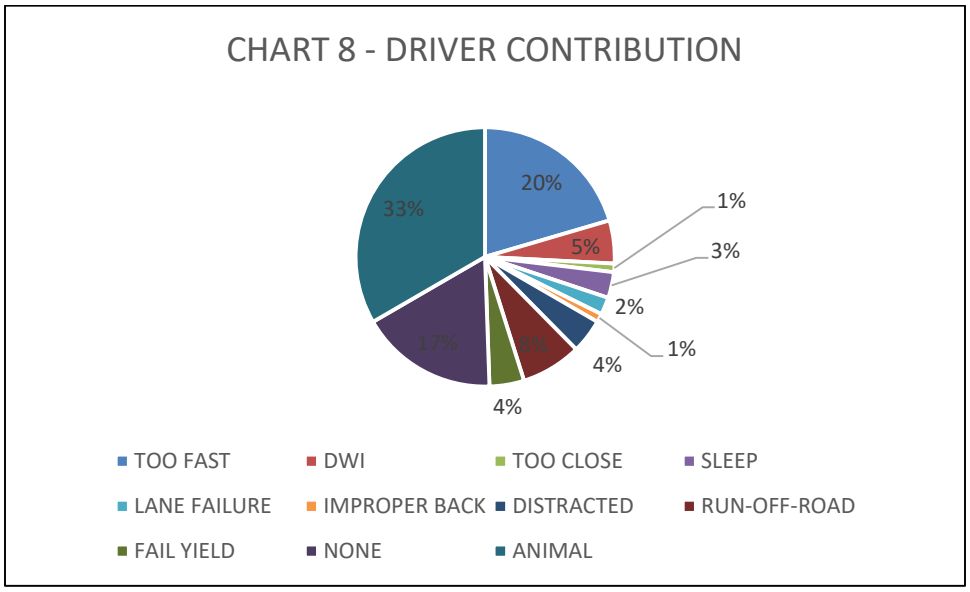
Light – Crashes were about evenly distributed between daylight and dark conditions (**Chart 6**).

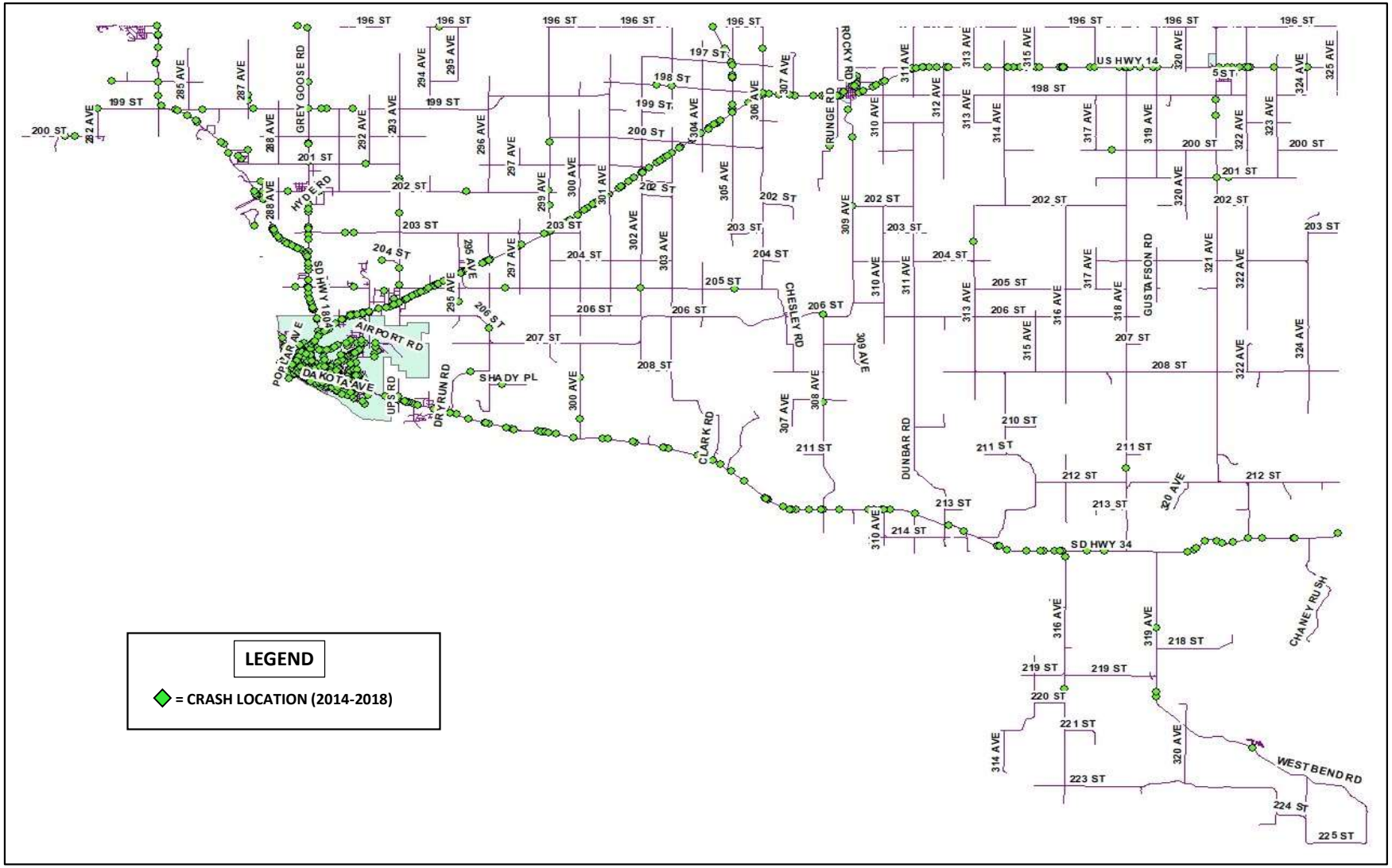


Weather – Most crashes occurred under clear skies, with relatively few occurring during inclement weather (**Chart 7**).



Driver Contribution – A wide range of contributing driver behaviors were cited in the crash records with driving too fast for conditions being the most-frequently occurring behavior. No adverse driver behavior was identified in a significant number of crashes. Again, South Dakota crash records allow entry of "animal" in this field to override the driver contribution.





HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 3
CRASH LOCATIONS

Traffic Volumes Review

A review of existing traffic volumes, forecasted future-year traffic volumes, and operational constraints was conducted to evaluate existing and future conditions and identify potential needs facing the County over the next 20 years.

Traffic Volumes

The SDDOT provided the most recent, available traffic counts on County, Municipal, and State-jurisdiction roadways throughout Hughes County. These volumes, represented by ADT counts, were collected between 2017 and 2019 through SDDOT traffic data collection programs.

A SDDOT-provided countywide growth factor[1] was used to mesh the various years of traffic counts and establish a consistent data set representative of 2019 Existing Conditions traffic volumes, presented in **Figure 4**. The same growth factor was then used to forecast traffic volumes representative of a 20-year planning horizon, referred as the 2040 Planning Year, to help identify potential future-year capacity constraints and considerations for future projects.

The ability of roadways to carry traffic is dependent on the roadway's geometric characteristics, including the number of lanes, lane width, etc. This roadway capacity can be determined through the analysis techniques contained in the *Highway Capacity Manual* (Transportation Research Board, 6th Edition, 2016), as implemented in the *Highway Capacity Software* (Federal Highway Administration and McTrans Center at the University of Florida, Version 7.5, 2019). When the traffic demand is compared to the traffic capacity, the roadway may be graded according to its *Level of Service (LOS)*. The Level of Service interprets the road's traffic operations with a letter grade similar to what a student would receive in school. Level of Service "A" describes a road with the best service, characterized by free-flowing traffic and little delay. Level of Service "F" describes a road with failed service and high delays or gridlocked conditions. Analysis techniques are available for all types of roadways and intersections. In the case of the Hughes County roadway system, road facilities have been analyzed as individual intersections and two-lane highway segments.

When large networks of roads, particularly rural gravel-surfaced roads, are considered, analysts may use service tables, which summarize level of service analysis in relation to traffic volumes. Florida Department of Transportation has prepared service tables, which are frequently used by practitioners throughout the country. A portion of the Florida service tables is shown in **Table 3**. The table indicates that a two-lane rural roadway operates at LOS B or higher when the traffic demand is less than 4,700 vehicles per day. Service volumes are also provided for LOS C – E.

TABLE 3 – SERVICE VOLUMES FOR RURAL UNDEVELOPED AREAS

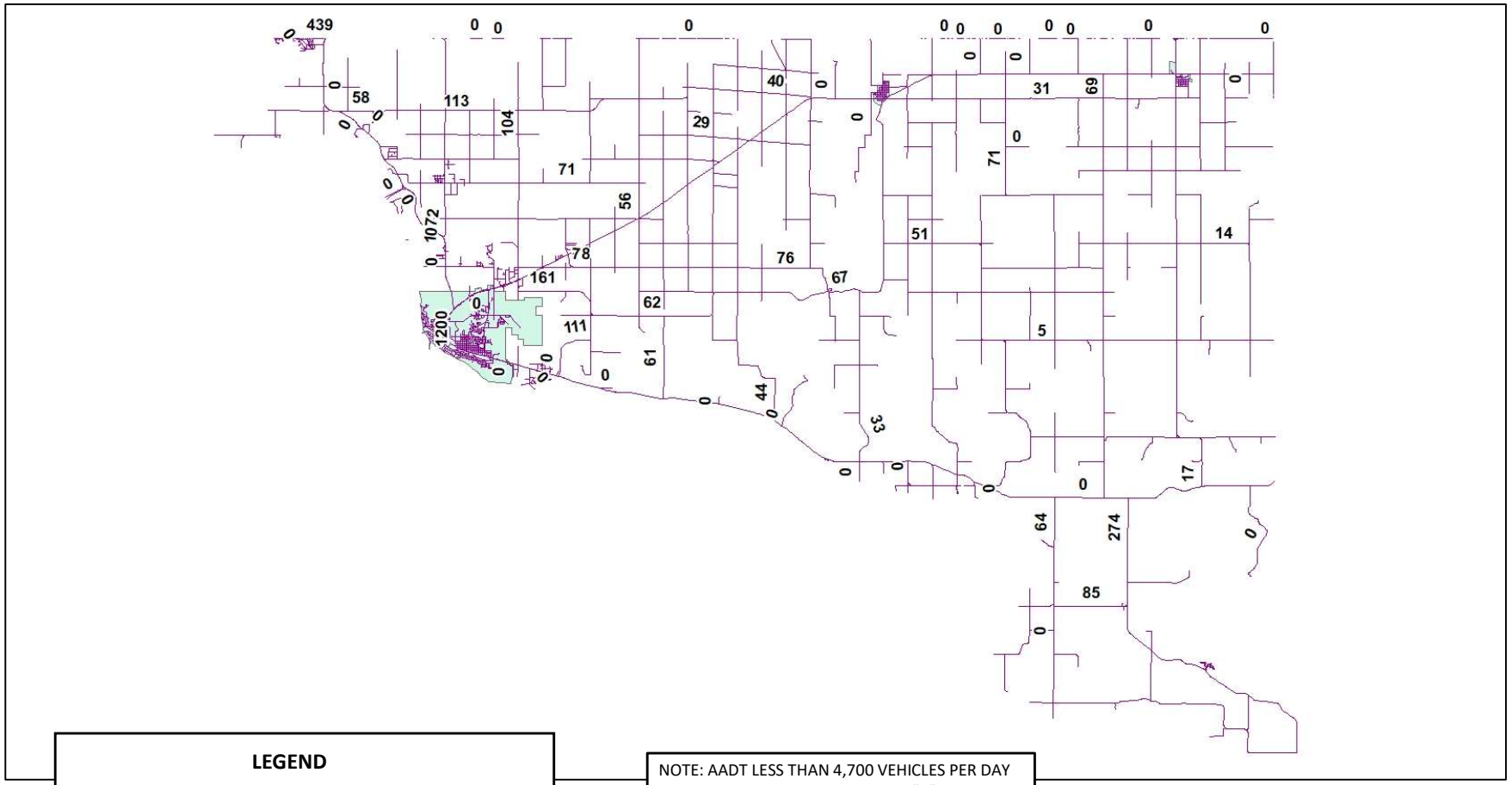
LANES	MEDIAN	B	C	D	E
2	Undivided	4,700	8,400	14,300	28,600

Available Average Annual Daily Traffic (AADT) volumes for the Hughes County roadway system were interpreted using the service volume table to determine the approximate level of service for each roadway segment. In cases where AADT volumes were not available, volumes were estimated based on surrounding values. Available AADT volumes are shown in **Figure 4**. With the highest recorded AADT on the Hughes County system at 1,072 vehicles per day, the resulting Level of Service for all segments of the existing system is B or higher. Level of Service for the Hughes County network is shown in **Figure 5**.

[1] 20-year growth factor for Hughes County was 1.5. Straight-line interpolation used to identify interim years. Additional information regarding traffic volume counts and growth rates can be found in Traffic and Crash History Memorandum located in Appendix A

Three intersections were also analyzed individually based on peak hour turning movement counts collected in October 2019. The intersection analyses show that the intersections are operating within acceptable peak hour parameters, with the lowest level of service being LOS C at the US 14-83/Kingsway Road/Airport Road intersection during the AM peak hour. Peak hour levels of service for each intersection are shown in **Figure 6**.

Overall, roadways in the Hughes County network provide uncongested travel with little or no delay.



LEGEND

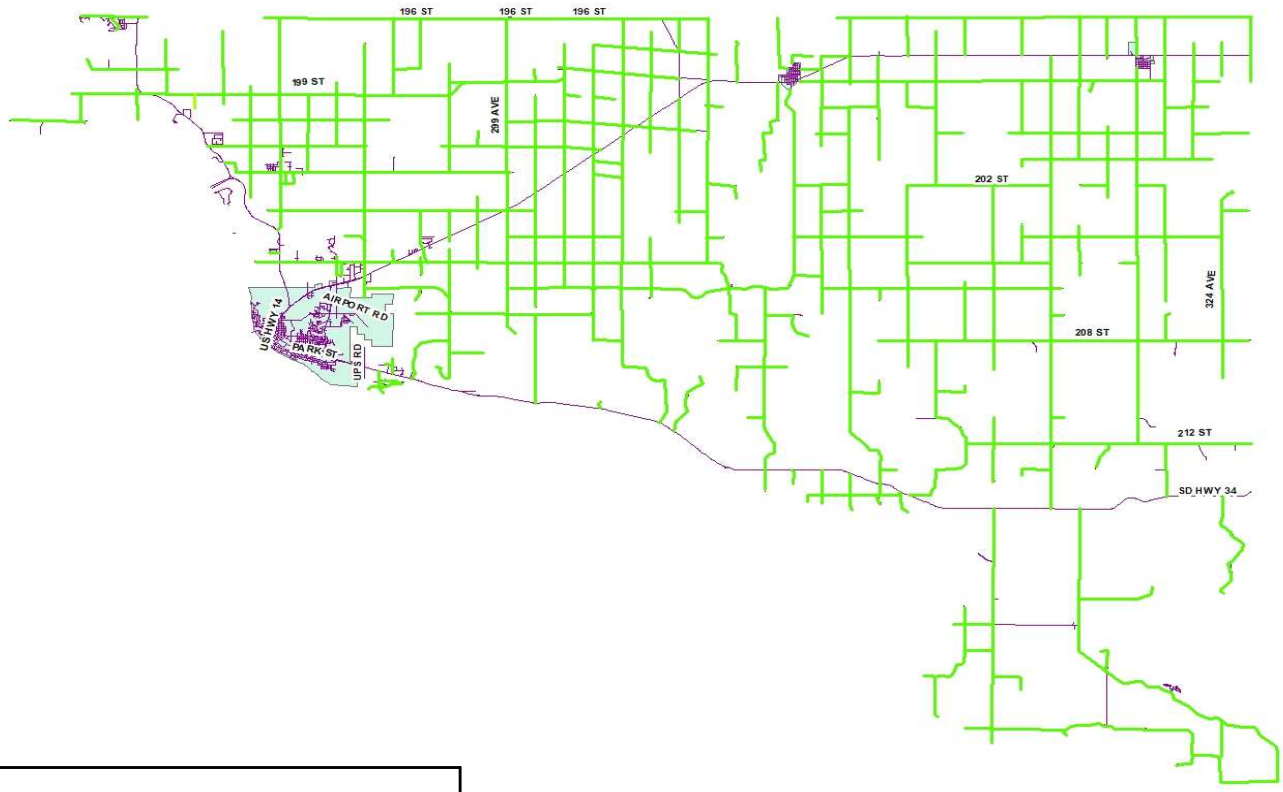
88 **AVERAGE ANNUAL DAILY TRAFFIC (AADT)**

NOTE: AADT LESS THAN 4,700 VEHICLES PER DAY EQUIVALENT TO LEVEL OF SERVICE "B" OR BETTER (FLORIDA DOT SERVICE TABLES)

HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 4
AVERAGE ANNUAL DAILY TRAFFIC



LEGEND

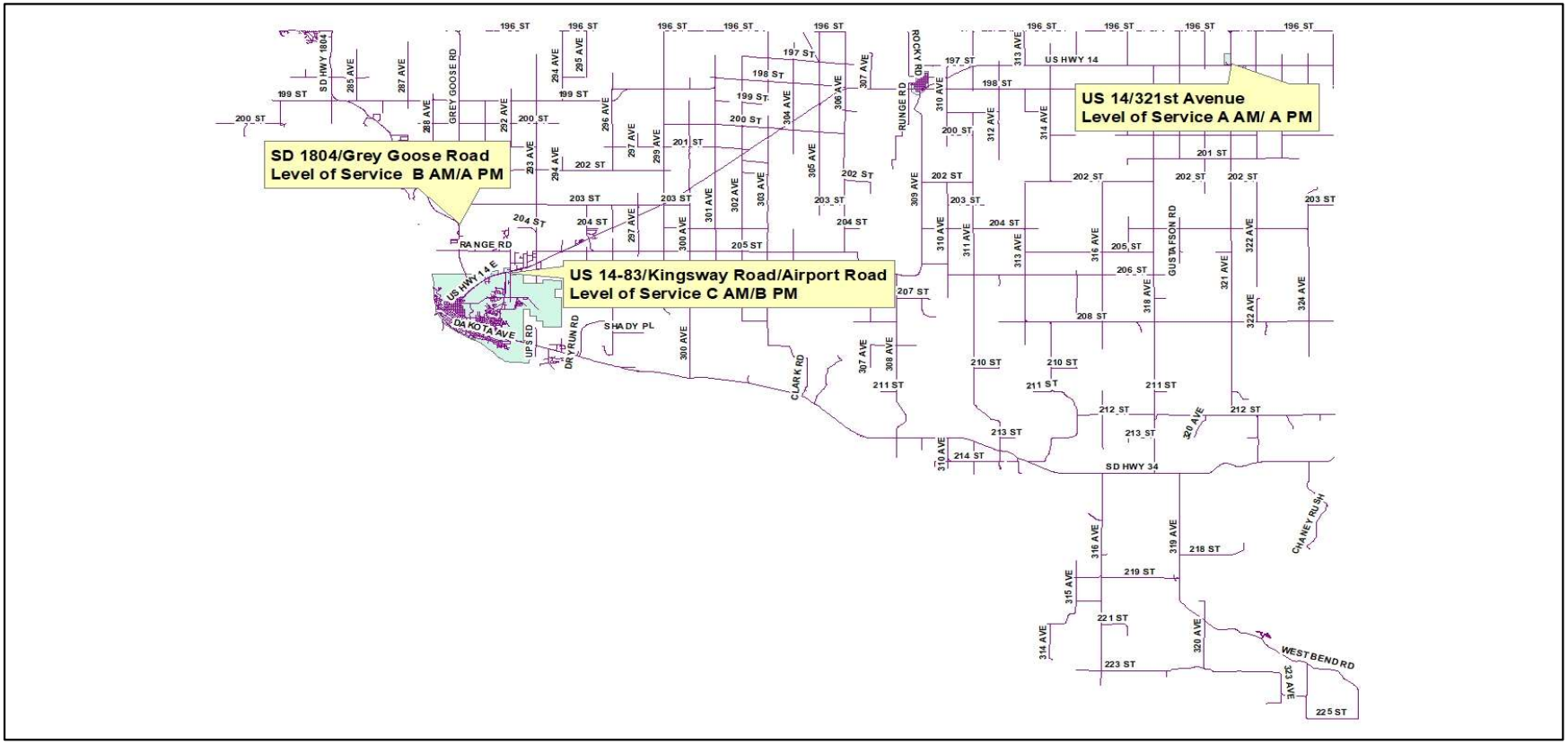
- LEVEL OF SERVICE A OR B
- LEVEL OF SERVICE C OR D
- LEVEL OF SERVICE E OR F

NOTE: AADT LESS THAN 4,700 VEHICLES PER DAY EQUIVALENT TO LEVEL OF SERVICE "B" OR BETTER (FLORIDA DOT SERVICE TABLES)

HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 5
LEVEL OF SERVICE



HRGreen	HUGHES COUNTY MASTER TRANSPORTATION PLAN	FIGURE 6 INTERSECTION LEVEL OF SERVICE

2040 Planning Year – Forecast Volumes and Level of Service

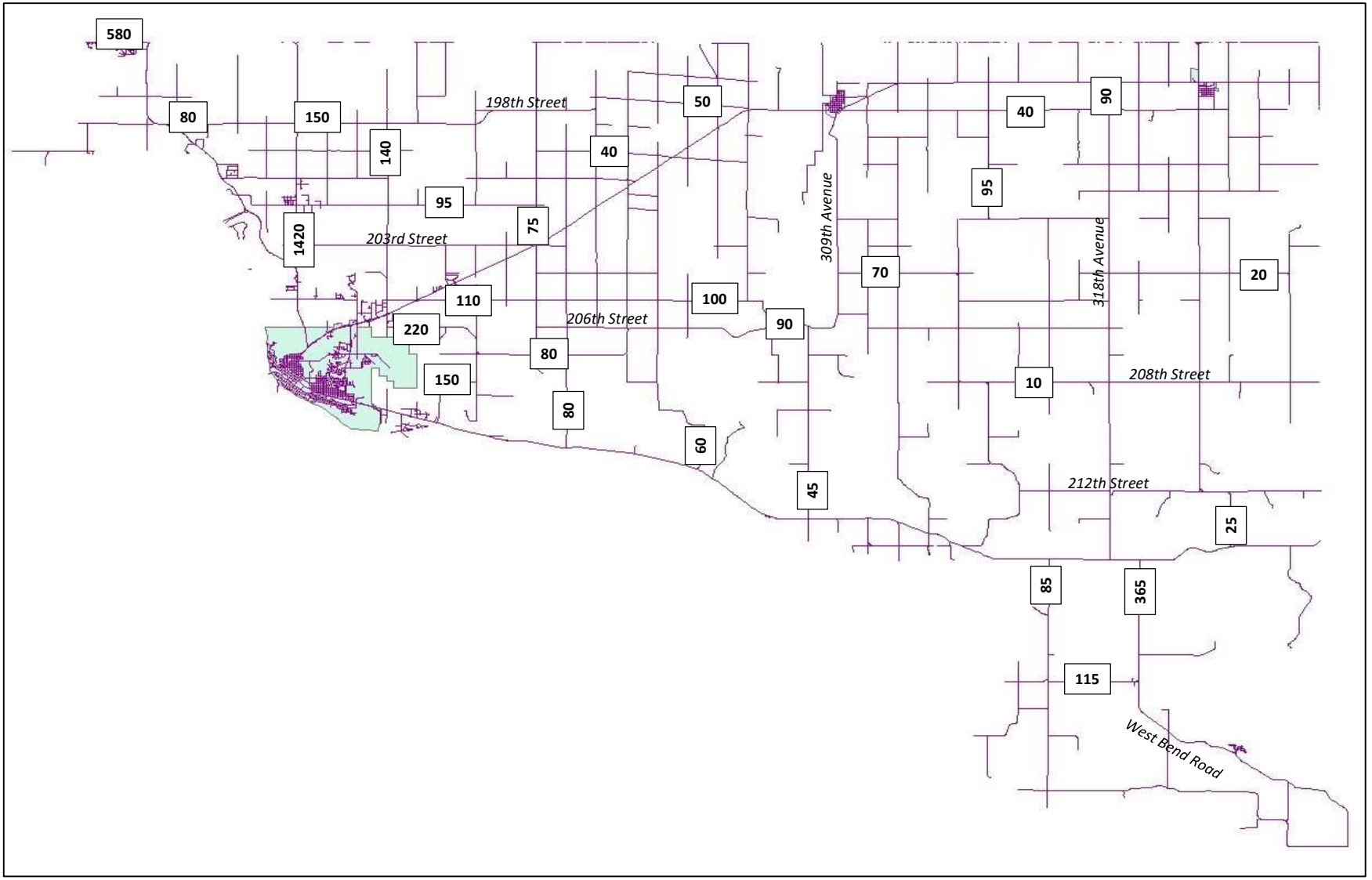
Daily traffic demand on the Hughes County highway network was estimated based on existing traffic and growth factors provided by SDDOT. The forecast volumes are shown in **Figure 7** and the level of service was determined in a manner like that used for the existing volumes. The forecast growth factors provided by SDDOT are:

- 20 year: 1.326
- 25 year: 1.400
- 30 year: 1.480
- 35 year: 1.560

Forecast years not directly covered by the growth factors were determined by interpolation.

The resulting 2040 Planning Year level results along Hughes County-jurisdiction roadways are provided in **Figure 8**. Overall, all Hughes County jurisdictional roadways are projected to exhibit level of service "B" or better on all existing roadways.

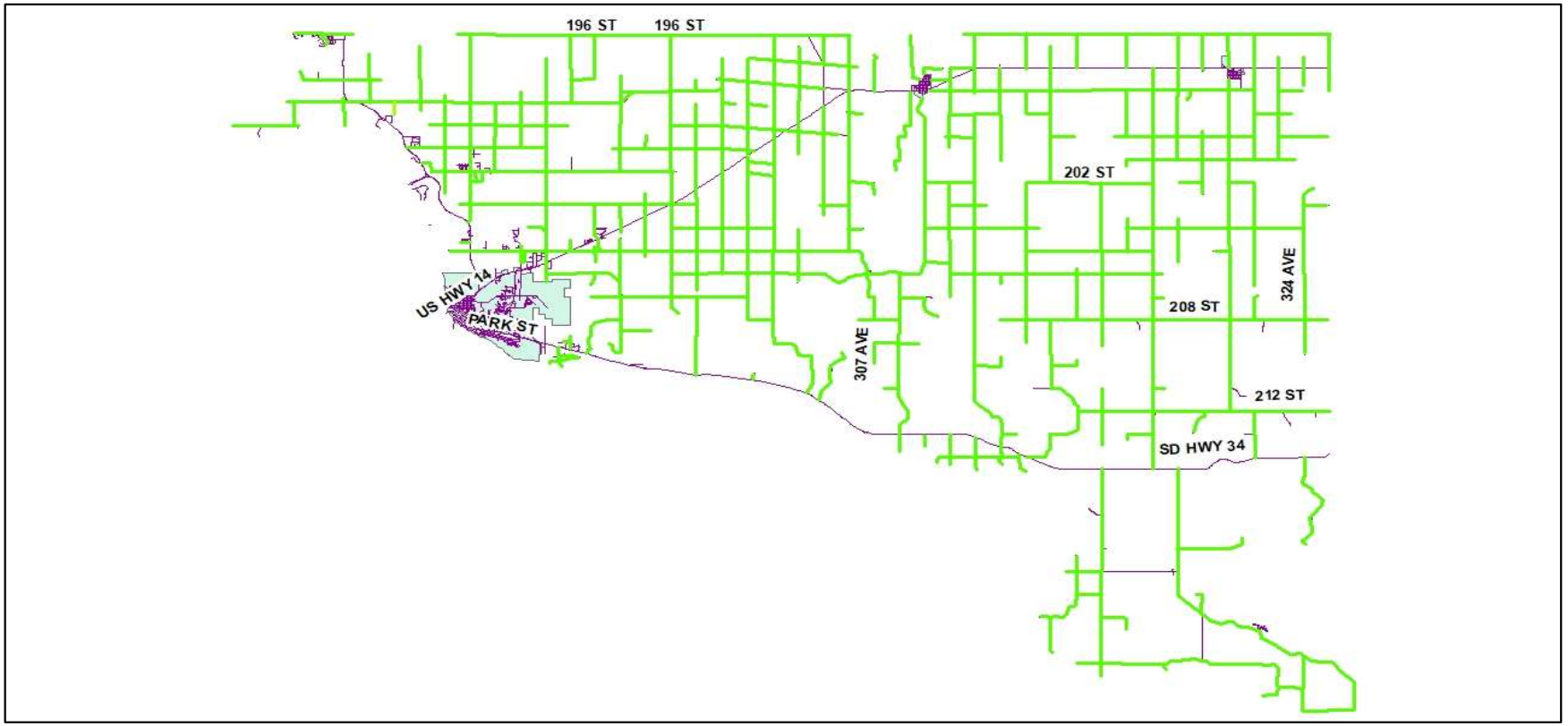
Peak hour turning volumes were forecast for the three intersections identified in the previous analysis. The resulting levels of service are shown in **Figure 9**. The intersection analysis shows a peak hour level of service of "C" or better at all three intersections.



HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 7
FORECAST AADT



LEGEND

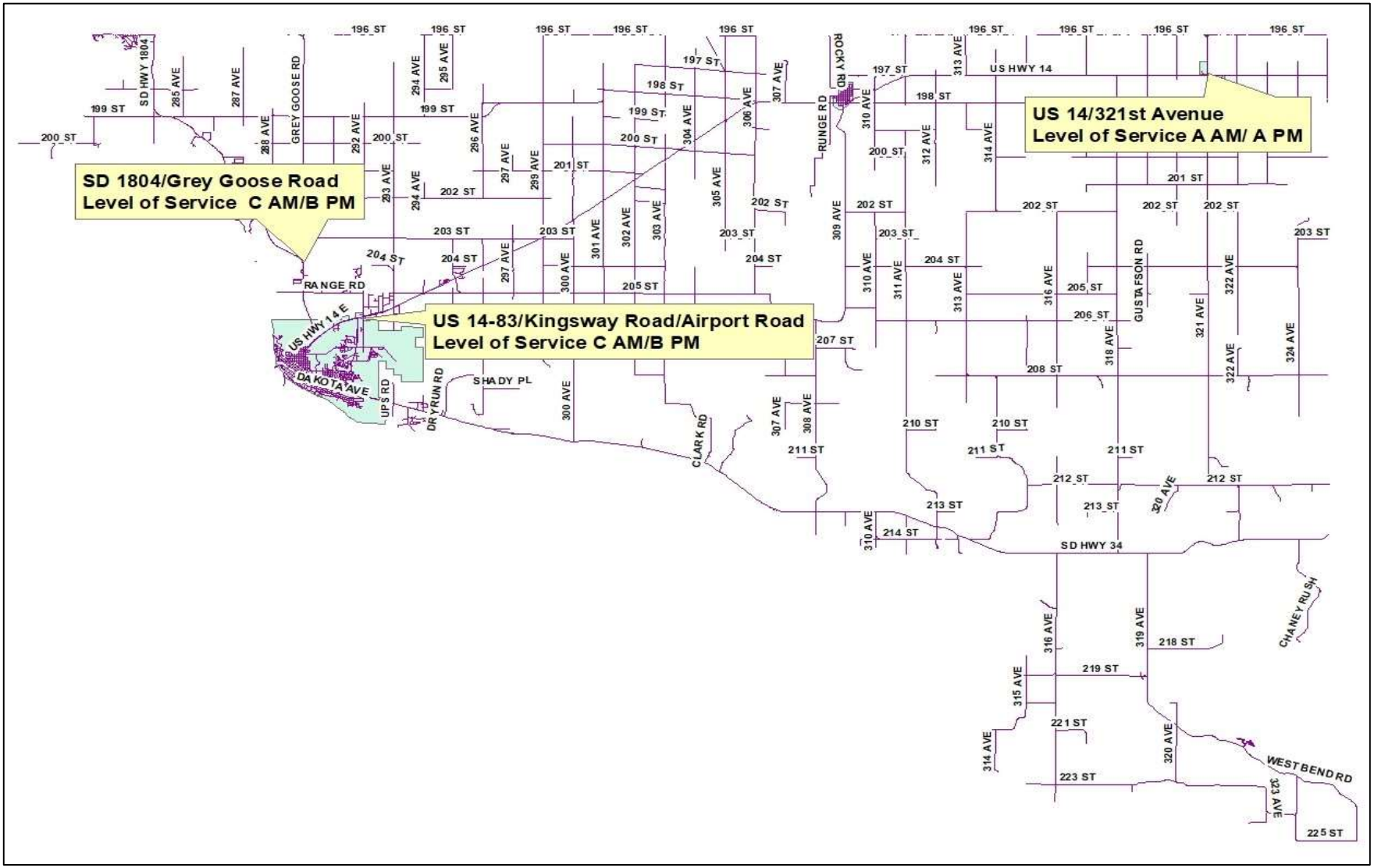
- LEVEL OF SERVICE A OR B
- LEVEL OF SERVICE C OR D
- LEVEL OF SERVICE E OR F

NOTE: AADT LESS THAN 4,700 VEHICLES PER DAY EQUIVALENT TO LEVEL OF SERVICE "B" OR BETTER (FLORIDA DOT SERVICE TABLES)

HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 8
FORECAST
LEVEL OF SERVICE



HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 9
FORECAST
INTERSECTION LOS

Regional Connectivity and Route Continuity

Regional connectivity and route continuity are important aspects of transportation mobility in Hughes County. Not only does the transportation network facilitate travel within the County, it is the gateway to efficiently transport goods, services, and people on a regional level through the interconnection of all roadway classifications and jurisdictions. Key elements of a well-connected transportation network with continuous, functional routes for local and regional travel include:

- Provide and maintain regional routes across the County, those that are continuous across multiple counties or key destinations.
- Provide connectivity to/from large-scale agriculture elevators in surrounding counties.
- Provide connectivity to/from recreational areas within the County.
- Provide connectivity for farm-to-market routes and linking towns throughout the region.
- Provide efficient connections to higher function routes (state highways).
- Minimize out-of-the-way travel when traveling primary routes or key destinations
- Provide consistent roadway geometry throughout a primary route.

The discussion of route connectivity and continuity lends itself to the establishment of route prioritization for future maintenance and reconstruction needs. Consideration of regional travel patterns, the interaction and interdependence of the County network with the US/State network, and efficient and safe multi-modal mobility is reflected in the development of the Hughes County Major Roads Plan.

Multi-Modal Characteristics Summary

Non-Motorized Transportation Network

A vast majority of the existing pedestrian and bicycle facilities are located within the County's urban areas, particularly within the City of Pierre where multi-use trails, sidewalks and wide streets are the most common multi-modal features. In rural areas, bicycle and pedestrian accommodations are typically on the existing roadway, either within the travel lane or on the adjacent shoulder when applicable. The Pierre Bicycle Plan has identified connections to rural routes for recreational and commuter trips. Those rural routes include SD Hwy 1804, US 14/83, and SD Hwy 34.

Public Transit

Public transit needs are served by River Cities Transit, which operates out of facilities in Pierre. River Cities provides on-call service (curb-to-curb) throughout the county, including school and healthcare-related trips.

Air Transportation

Commercial passenger, charter passenger, air freight, and agricultural air services are all provided at the Pierre Regional Airport. Agricultural air service is also provided at Harrold.

Freight Transportation

Freight is primarily moved via truck within Hughes County. Several local truck-train transload-type facilities that are of notable benefit to the Hughes County economy are located within Hughes and Sully counties, including:

- Grain Terminal with Rail Access
  - Pierre (Hughes County)
  - Harrold (Hughes County)
  - Blunt (Hughes County)
- Ethanol Plant with Rail Access
  - Onida (Sully County)

Highway Freight

Hughes County residents benefit from many opportunities for regional connectivity on state highways in both east/west and north/south directions.

In 2018, heavy vehicles traveled over 11.7 million miles[2] within Hughes County with over half (7.2 million vehicle miles traveled, or VMT) of that occurring on the State highway system. Rural local system mileage for heavy vehicles was nearly 1.3 million VMT. This illustrates the importance of both State and County-maintained roadways in freight movement.

Rail Freight

The lone rail line in Hughes County cuts east-west from Pierre to east of Harrold and parallels US 14 between Blunt and the Hyde County border. The Rapid City, Pierre and Eastern railroad provides general freight service across South Dakota, including cement, bentonite, timber, and agricultural commodities. Local transload facilities on this line are located in Pierre, Blunt and Harrold.

[2] 2018 Vehicle Miles Traveled (VMT) by County for Heavy Trucks. http://sddot.com/transportation/highways/traffic/Default.aspx

Special Areas of Concern

A number of areas of concern were listed by the Study Advisory Team for the Hughes County Master Transportation Plan and supplemented by discussions at the project kick-off meeting. Each of the areas of concern are discussed below:

Intersection SD 1804/Grey Goose Road – This intersection has relatively high peak period volumes, but operates at level of service B in the AM peak hour and level of service A in the PM peak hour. The intersection already has a northbound right turn lane and peak hour volumes are insufficient to warrant additional turn lanes. One crash was recorded at the intersection from 2014 through 2018 involving a driver cited for DUI. While there is no evidence that intersection lighting is required, a street light may be appreciated by commuting drivers to help identify and navigate the intersection.

Intersection of SD 1804/Grey Goose Road

Intersection US 14-83/Kingsway Road/Airport Road – SDDOT has improved this intersection and the adjacent intersection of US 14-83/Garfield Avenue to improve safety. Several other long-term improvements have been proposed for the intersection. The west shoulder of Kingsway Road has been widened to facilitate access to the row of mailboxes serving nearby residences, but northbound drivers have been observed crossing the southbound lane to pick up mail from the driver's door.

The US 14-83/Kingsway Road/Airport Road intersection has been altered to limit some high-risk movements and improve traffic flow.

Northbound drivers have been observed crossing the southbound lane to pick up mail from the driver's door. Line of mailboxes circled in photo.

Intersection US 14/321st Avenue – Grain trucks use this intersection to access the transshipment points on the railroad south of US 14. The intersection has peak hour level of service A during both the AM and PM periods, although truck queues have been noted during harvest. No warrants for turn lanes are met and no crashes were reported in the five-year reporting period. Intersection sight distance is good.

The US 14/321st Avenue intersection, looking east.

Intersection US 14-83/Windsor Place – Drivers have created an off-road trail between Windsor Place and Buhl Place to save a short travel distance when making certain maneuvers. The trail crosses both private property and highway right-of-way. Also, another line of mailboxes creates conflicts with vehicles approaching the highway on Windsor Place.

An off-road trail between Windsor Place and Buhl Place.

Mailboxes on the Windsor Place approach to US 14-83.

206th Street from North Airport Road to 293rd Avenue – This undeveloped section line right-of-way connects to a primary County route. Development of a roadway in this segment is opposed by the City of Pierre because it lies within the airport runway safety zone. North Airport Road is a local alternate surfaced route that is signed "No Trucks".

206th Street from 293rd Avenue to 296th Avenue – 206th Street provides access to public facilities and carries a concentration of truck traffic.

196th Street from Grey Goose Road to US 83 – 196th Street provides a straight, continuous connection between northern Hughes County and US 83.

309th Avenue from Blunt to 204th Street – 309th Avenue serves traffic destined for Blunt and US 14, including local truck traffic.

318th Avenue from US 14 to SD 34 – 318th Avenue connects north to south across Hughes County and provides a route between US 14 and SD 34.

UPS Road – UPS Road appears to have been constructed in sections as houses were built on the bluff north of SD 34. It suffers from a lack of consistent ditches and planned drainage, landslides, and steep roadway grades.

UPS Road, looking north from SD 34.

Bridge on 310th Avenue east of Blunt – This bridge is in poor condition and better service is provided by nearby US 14.

Bridge on 310th Avenue; note the deteriorated concrete.

Bridge on 314th Avenue ½ mile south of US 14 – This bridge is in poor condition, but serves a primary County route.

Bridge on 321st Avenue south of Harrold – This bridge showed significant deterioration in the recent inspection and is partially closed to traffic.

General Roadway Condition

An inventory of basic roadway conditions was conducted to establish baseline conditions and identify roadway segments that may need improvement. Generally, Hughes County roadways were in good condition; providing firm, well drained asphalt and gravel surfaces. A short list of roadway segments was compiled to provide guidance for future maintenance efforts:

- Grey Goose Road – 196th Street to 199th Street (paved): some cracking, settlement and pothole issues (roadway was milled and repaved after 2019 inspection).
- West Bend Road – 319th Avenue to West Bend Recreation Area (paved): pavement break-up, shoulder drop-off
- 196th Street – 295th Avenue to 299th Avenue and US 83 to 305th Avenue (gravel): rutting, washboard, needs maintenance
- 225th Street – 324th Avenue to 326th Avenue (gravel): flat crown, poor shoulder drainage, washboard, rutting
- 311th Avenue – 196th Street to US 14 (gravel): needs grading
- 318th Avenue – 198th Street to SD 34 (gravel): in great condition considering heavy truck usage
- 326th Avenue – West Bend Road to 225th Street (gravel): flat crown, poor shoulder drainage, washboard, rutting

- West Bend Road – West Bend Recreation Area to 326th Avenue (gravel): flat crown, poor shoulder drainage, washboard, rutting

An inventory of roadway conditions is included in **Appendix A**.

Note that an extensive gravel road system like that in Hughes County requires intensive, on-going maintenance. The condition of Hughes County gravel roads indicates a high level of attention to maintenance and high standards for good gravel road characteristics.

3. Needs Assessment

The following section presents issues and needs identified by the study team, stakeholders, and the public to aid in the development of multi-modal transportation priorities and solutions for Hughes County over the next 20+ years.

Public and Stakeholder Involvement

Three project stakeholder meetings and two public information meetings were held in Pierre and Blunt on February 5-6, 2020 to request input on transportation issues and needs throughout Hughes County. An online transportation survey was also developed as part of the initial outreach effort. A summary of the meeting information and submitted comments, which fed directly into the identification of transportation network needs in the following section, is provided in **Appendix B.**

Transportation Network Needs

Through a collaborative effort of the study team, stakeholders, and the public, a series of issues and needs were identified throughout Hughes County for this Master Transportation Plan to address. Following the initial public and stakeholder involvement, the collective set of issues and needs were organized into three categories:

- Bridge Condition
- Connectivity and Continuity
- Roadway Surfacing

These issues and needs are spatially depicted in **Figure 10**. (Figure 10 does not include regular maintenance needs or projects already programmed.) Each category is summarized in the following sub-sections, expanding upon the issues and needs discussed at each of the identified locations.

Bridge Condition

Bridges identified as being structurally deficient or barriers to travel were identified on the transportation needs figure. As of the 2018 countywide bridge inspections, 6 bridges were identified as structurally deficient and 4 were weight restricted (posted for load). From a long-range perspective, 14 bridges are currently more than 50 years old. In many instances, bridge closures and even restrictions in maximum loads allowed to cross a bridge create barriers and limit route functionality within the transportation network.

Countywide bridge conditions and long-term needs are discussed further in the Bridge Plan section of the Hughes County Master Transportation Plan.

This bridge east of Blunt was constructed in 1934, is currently posted for load restriction, and has a sufficiency rating of 26.9.

Connectivity and Continuity

Agriculture is the primary industry in Hughes County, thus the roadways throughout the County experience notable heavy truck and large equipment travel demand. Efficient, well-maintained routes that can accommodate heavy loads frequently hauled by farmers are critical to the economy of Hughes County. Destinations for agricultural and livestock commodities exist both within and outside of Hughes County.

Generally, these locations can be accessed via the State highway network, but there is also demand for truck travel across the County highway system. Trucks destined for the regional landfill also use County roads.

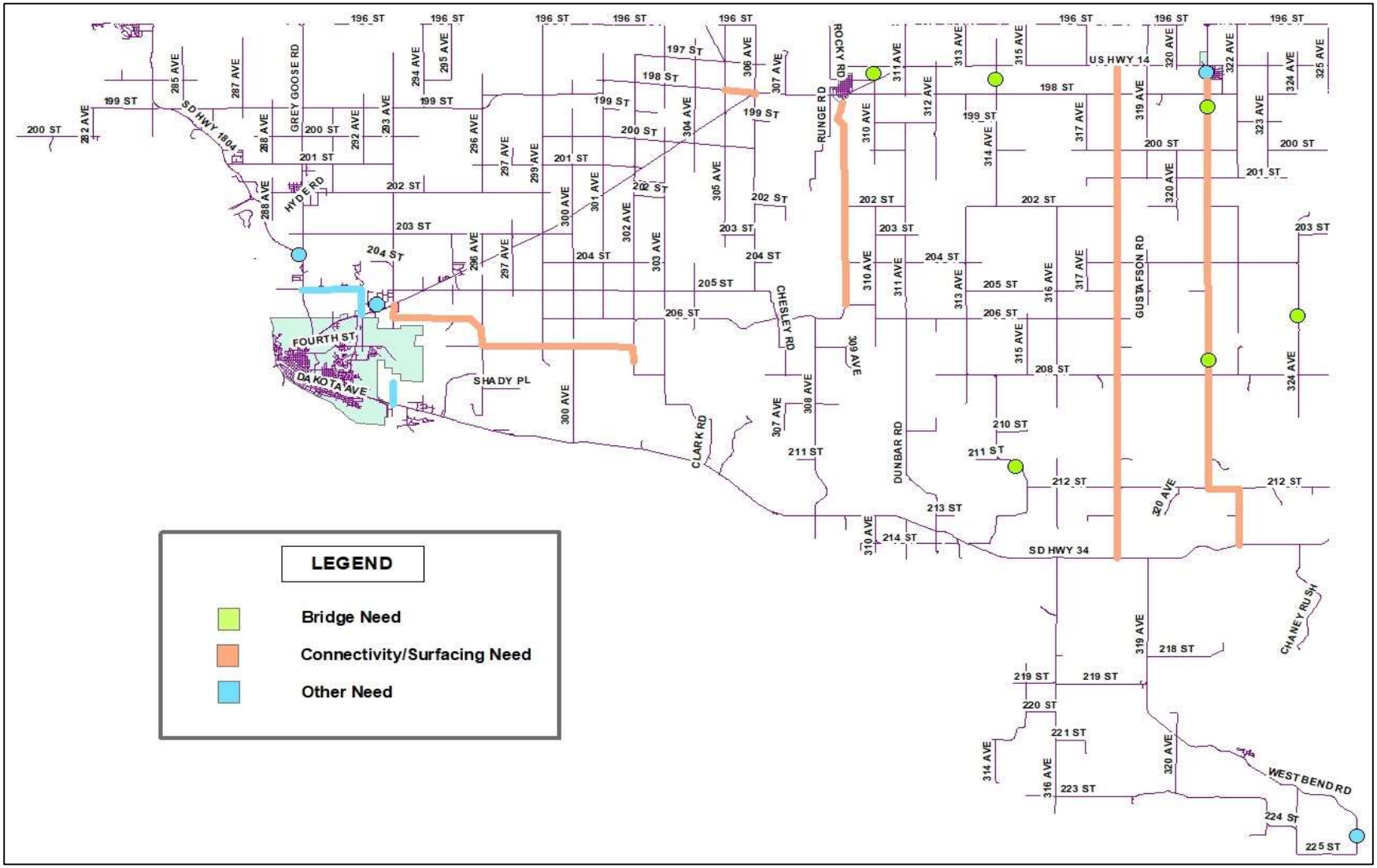
The following roadways have been identified as routes associated with freight movement across Hughes County. They provide the connectivity needed to maintain efficient freight service:

- 293rd Avenue/206th Street/207th Street to regional landfill
- 309th Avenue to Blunt
- 318th Avenue between US 14 and SD 34
- 321st Avenue to transload facilities at Harrold

Roadway Surfacing

While the roadway condition inventory found that the current Hughes County roadway network of asphalt and gravel surfaced roads was in good condition during dry weather, that is not always the case. Under spring snowmelt or persistent rain, gravel roads can experience rutting and poor performance. Poor wet weather road conditions are particularly problematic for heavy trucks and farm equipment. The wet weather performance of County gravel roadways could be improved by installing asphalt pavement.

The roadway segments listed above are all currently gravel surfaced. Their roles as freight corridors indicates the need for eventual paved surfacing.



HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 10
ROADWAY NEEDS

4. Major Roads Plan

The Hughes County Major Roads Plan provides a prioritized framework for maintaining and improving Hughes County highways over the next 20+ years. It was developed in partnership with Hughes County, South Dakota Department of Transportation, and project stakeholders to provide a comprehensive approach to transportation mobility and safety planning throughout the County.

Hughes County Roadway Network

The roadway network in Hughes County is an interconnected network of highways and roads, primarily across the following jurisdictions:

- US/State highways (US 14, US 83, SD 34, SD 1804)
- Hughes County highways
- Urban roads (Pierre, Blunt, Harrold)
- Other (i.e. private and recreational roadways)

Each plays an important role in balancing appropriate levels of mobility and access, ranging from national mobility goals for the Interstate system to local access goals of Township roads. The interrelationships between each jurisdiction and the function each roadway provides are key elements to the Major Roads Plan.

State Highways

State designated highways are the highest functioning roadways within Hughes County and are intended to provide the highest level of speed, mobility, and heavy load accommodations while connecting the large activity centers across the region. These facilities are the focal point for regional connectivity and heavy load accommodations within the Major Roads Plan.

Hughes County Highways

Hughes County-jurisdiction highways provide varying levels of mobility and access depending on the goal and needs of each facility. These roadways may serve medium-to-long distance trips, connect smaller rural communities, carry intra-county traffic, and provide access to/from the US/State highway system. Travel speeds, traffic volumes, and roadway surfacing types are typically dependent on the facility's goals and needs.

Urban Roads

Urban roads are those within urban areas and are typically owned and maintained by the respective municipality. These roads vary from providing high levels of mobility and less access to focusing on access and connectivity to higher-volume facilities. US/State highways and Hughes County highways may also traverse through municipalities and often function as a higher-functioning route with controlled access, greater traffic capacity, and higher speeds through the community.

Other Roads

Other roads include private and recreational roadways that focus on access and provide a connection to a public roadway.

Hughes County Major Roads Plan

The Hughes County Major Roads Plan focuses on County-jurisdiction roadways and their appropriate levels of mobility, access, and freight accommodations within the overarching regional transportation network. To aid in the development of the Major Roads Plan, the following objectives and priorities were established:

1. Maintain and improve the overall transportation network, utilizing and building upon existing investments.
2. Maximize the benefits of the existing state highway network for intra-and inter-county trips.
3. Maintain and improve regional connectivity and route continuity of similar facilities.
4. Assign prioritization of parallel or duplicate routes.
5. Evaluate and understand route purpose and other transportation needs, such as:
    a. Existing truck routes, posted load limits, and farm-to-market connectivity.
    b. Mobility and land access relationships in recreational and transitioning rural areas.
    c. Connectivity of regional population centers, regional activity centers, and other traffic generators.
6. Provide appropriate roadway surfacing based on traffic demand.
7. Provide appropriate roadway jurisdiction based on traffic demand.
8. Provide 'all-season' access between each municipality and a State highway.
9. Provide route connectivity to transload grain terminals, ethanol plants, and other agricultural businesses.

The backbone of the regional transportation network will continue to be the US/State highway network, providing the highest levels of vehicle, freight, and multi-modal mobility in the County. At the other end of the spectrum, Urban roadways will continue to provide local access and important connections to higher-functioning roadways. Hughes County-jurisdiction highways span between these bookends in the mobility and access relationship, with function and purpose highly dependent on characteristics and needs of each facility.

With consideration to the aforementioned priorities and objectives, the Major Roads Plan establishes County highway categories in terms of roadway function as follows:

- Non-county Primary
- Non-county Secondary
- County Primary
- County Secondary
- Local/Other

The proposed Major Roads Plan is shown in **Figure 11.**

Non-county Primary

Non-county Primaries include roadways with AASHTO designations serving higher traffic volumes and long-distance trips. These roadways are within the jurisdiction of SDDOT. They are built to high design standards and paved with portland cement or asphalt concrete.

Non-county Secondary

Non-county Secondaries include roadways with State highway designations serving trips primarily between destinations within South Dakota. These roadways are within the jurisdiction of SDDOT. While the design standards used may not reach the level used for principal arterials, they meet all pertinent standards for high-speed travel by all vehicles. They are paved with portland cement or asphalt concrete.

County Primary

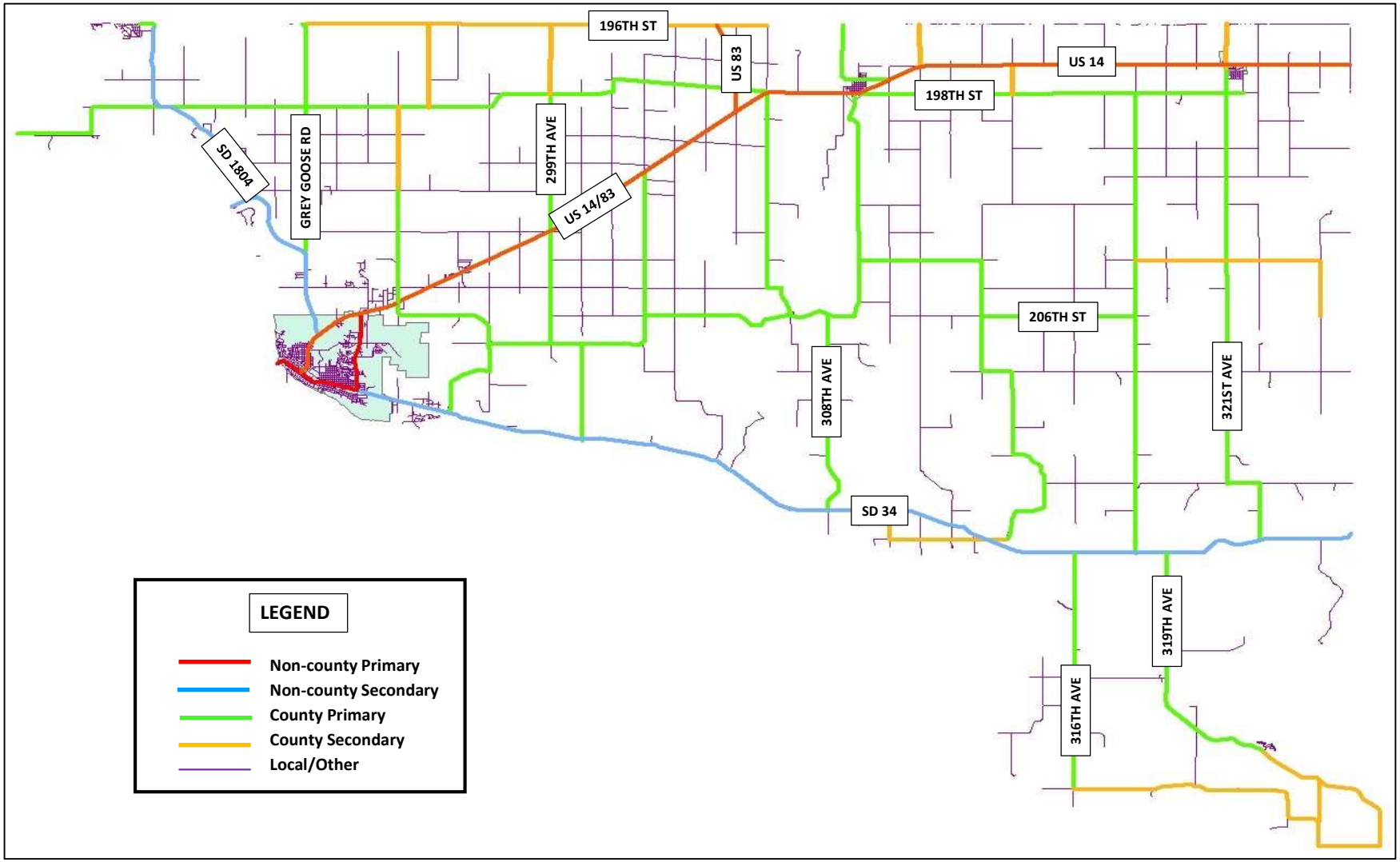
The County Primary classification includes the Hughes County primary road network. These roads provide longer-distance travel across the County and provide connections to arterial roadways and County destinations. Higher volume segments and segments with heavy truck use may be paved with asphalt concrete, while the remainder of the major collector system has blotter or gravel surfacing. County Primary gravel surfaces are frequently treated with magnesium chloride for dust control and binding of fine particles.

County Secondary

County Secondary roads include the Hughes County secondary road network. These roadways provide useful connections between County Primaries and are gravel surfaced.

Local/Other Roads

A few low-volume roads and roads within rural subdivisions exist under Hughes County jurisdiction. These roads are subject to limited maintenance, removal from service or transfer of jurisdiction to local road districts under conditions defined in proposed policy provisions in **Appendix C.**



HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 11
MAJOR ROADS PLAN

5. Bridge Plan

The Bridge Plan provides a review of current bridge conditions across Hughes County, examines costs of bridge repair and replacement, and identifies a plan to help prioritize bridge improvements over the next 20+ years.

Existing Bridge Conditions

Hughes County is currently responsible for maintaining 22 of the bridges within the County and numerous other smaller culverts and drainage structures. The 22 bridges are part of a biennial bridge inspection that rates bridges on the current level of sufficiency based on National Bridge Inventory System standards. Sufficiency ratings, ranging on a scale from 0 to 100 percent, are used to indicate a measure of the bridge's ability to remain in service. A 100 indicates an "entirely sufficient bridge" and a 0 indicates an 'entirely insufficient or deficient bridge.[3] The 2018 biennial inspection indicated a Hughes County-maintained bridge sufficiency average of 76.25 percent.

In addition to level of sufficiency, bridges are categorized as functionally obsolete, structurally deficient, or not deficient. Within Hughes County, 4 of the 22 bridges maintained by the County are considered structurally deficient. As of the 2018 inspections, one existing Hughes County-maintained bridges is considered functionally obsolete.

An overview of the 22 bridges maintained by Hughes County, including sufficiency rating and status regarding being structurally deficient, is provided in **Figure 12**.

Functionally Obsolete

Bridges are considered functionally obsolete when the deck geometry, load carrying capacity (comparison of the original design load to the current State legal load), clearance, or approach roadway alignment no longer meet the usual criteria for the system of which it is an integral part. In general, functionally obsolete means that the bridge was built to standards that are not used today.

Structurally Deficient

Bridges are considered structurally deficient if significant load carrying elements are found to be in poor condition due to deterioration and/or damage, or the adequacy of the waterway opening provided by the bridge is determined to be extremely insufficient to the point of causing overtopping with intolerable traffic interruptions.

County Primary Route Needs

Maintaining prioritized, continuous routes with similar vehicular and equipment accommodations, such as load, width, and height, is an important part of countywide mobility. This is of particular importance to agricultural operations and freight transportation. When a bridge is no longer able to accommodate a certain vehicle load, width, or height, commensurate with the maximum accommodations of the roadway corridor, it becomes a barrier within the transportation network and necessitates a detour that can sometime lead to several additional miles of travel. It is important that the impacts of posting a bridge for restricted loads be considered in the long-range planning of major bridge rehabilitation or replacement as the function of a bridge is compromised if it is not serving the vehicular demand at the crossing.

[3] *Bridge Preservation Guide: Maintaining a State of Good Repair Using Cost Effective Investment Strategies*, U.S. Department of Transportation, Federal Highway Administration, 2011.

Bridge Improvement Grant (BIG) Funding

The South Dakota Legislature created the Bridge Improvement Grant (BIG) fund that provides $7 million annually for local government bridge preservation and replacement. The fund was supplemented with an additional $2 million by the SDDOT until 2019 when it increased to $6 million.[4] Funding eligible activities and projects include, as of 2018, preliminary engineering (PE), preservation, major rehabilitation, and replacement projects.

As a statewide grant-based fund, the 2018 procedures establish criteria for two rankings, one for preliminary engineering and rehabilitation/replacement grants and second for preservation grants. These rankings are used to aid in the selection of bridges based on prioritized needs, impacts, and local contribution to funding the bridge project.

BIG Preservation Ranking Criteria (2018)

1) User Impact
2) Cost Ratio
3) Wheel Tax
4) LPA Financial Commitment
5) Load Rating
6) Scour
7) Substructure Condition
8) Superstructure Condition
9) Culvert condition
10) Service Life
11) Quality of Project

BIG PE and Rehabilitation/Replacement Ranking Criteria (2018)

1) Bridge Condition (50 points maximum)
   a. Posting
   b. Substructure condition
   c. Superstructure condition
   d. Culvert condition
   e. Fracture critical
   f. Scour critical
   g. Sufficiency rating
2) User Impact (20 points maximum)
   a. Traffic volumes (ADT)
   b. Detour length
3) Local Planning (30 points maximum)
   a. County wheel tax
   b. Bid ready status
   c. Local agency commitment

Bridge Plan Elements

The Hughes County Bridge Plan incorporates a proactive and comprehensive approach to planning for and managing future bridge improvements in Hughes County over the next 20+ years. The goal is to develop guidelines for a cost-effective process of managing existing and newly constructed bridges to maximize their performance and useful life, ultimately lowering the lifetime cost to the County. Bridge Plan conclusions are not intended to serve as Bridge Condition Reports or as a design or construction document, rather they provide guidance towards the planning of long-term investments and management of available resources.

The Bridge Plan is structured to function in line with the South Dakota BIG procedures, using similar terminology and approach. This will afford Hughes County a systematic process of identifying bridge improvements and seamless integration towards BIG funding applications or funding the bridge activity 100 percent locally. Therefore, the Bridge Plan incorporates a simplified process of maintaining a bridge through its useful life, incorporating the following elements adapted from the SDDOT's Bridge Improvement Grant Procedure manual and FHWA's Bridge Preservation Guide:

- Routine Maintenance
- Bridge Preservation
- Bridge Rehabilitation
- Bridge Replacement

[4] *Bridge Improvement Grant (BIG) Procedure 2018,* South Dakota Department of Transportation, Office of Local Government Assistance, June 29, 2018.

The following definitions of each activity are adapted from the SDDOT's Bridge Improvement Grant Procedure manual and FHWA's Bridge Preservation Guide, as noted. The relationship to BIG funding eligibility and notable requirements for each activity are included as well. Additional information can be found in the source documents.

Routine Maintenance (required for BIG major rehabilitation and replacement eligibility)

Routine maintenance includes smaller cyclical, often annual, maintenance activities for bridges in good to fair condition. The goal is to maintain and preserve bridge elements to help extend the useful life of the structure. Routine maintenance may also be in response to specific needs. Examples of routine maintenance items include:

- Vegetation removal
- Wash de-icing chemicals and debris off bridge deck
- Wash bridge seats
- Remove debris from expansion joints
- Clear all deck drains
- Clean and prime exposed rebar
- Seal cracks in the deck including exposed keyways between precast elements

Bridge Preservation (BIG funding eligible)

Bridge preservation includes actions or strategies that prevent, delay, or reduce deterioration of bridges or bridge elements, restore the function of existing bridges, keep bridges in good condition and extend their life. Preservation actions may be preventative or condition-driven (*Source: FHWA Bridge Preservation Guide*). Examples of bridge preservation work identified in the SDDOT BIG Procedure manual include:

- Scour remediation (rip rap to fill scour holes and address potential scour)
- Steel repairs
- Expansion joint repair and/or replacement
- Cleaning and painting fascia beams and railing
- Replace railing
- Seal deck to minimize water intrusion (Asphalt on membrane, epoxy chip seal or apply a silane or siloxane sealer)
- Epoxy crack injection
- Concrete patching (deck, abutments, piers and wingwalls)
- Grind and hydro-demolition of deck clear cover and replacement with a latex modified concrete surface
- Remove wearing surface and replace with 2" of Latex Modified Concrete
- Jacket and or replace deteriorated timber piles. Repair timber abutment lagging and wingwalls

For BIG funding eligibility, minor repair, rehabilitation, or preservation work must be valued greater than the set preservation financial minimum and extend the service life by at least 10 years.

Bridge Rehabilitation (BIG funding eligible)

Rehabilitation projects include major repair or rehabilitation work to restore the structural integrity of a bridge and restore any major defects (*Source: FHWA Bridge Preservation Guide*). A combination of preservation activities to several bridge components may also be categorized as rehabilitation work. Rehabilitation projects may include:

- Remove and replace super structure[5]
- Remove and replace deck, end diaphragms and bearings[5]
- Clean and paint the existing steel

[5] Both items offer the opportunity to make the new deck fully composite with steel beams to obtain a higher live load capacity.

- Remove and replace concrete deck beams (in kind or similar)
- Construct concrete bridge approach slabs

For BIG funding eligibility, work must be valued greater than the set rehabilitation financial minimum.

Bridge Replacement

Bridge replacement includes the total replacement of the bridge or culvert structure, including approach work required to connect the new bridge to the existing roadway.

Preliminary Engineering (BIG funding eligible)

Preliminary engineering includes items such as preliminary structure design, preservation/rehabilitation/replacement investigation studies, surveys, bridge hydrologic/hydraulic (H/H) studies, including type, location, and size recommendations (*Source: SDDOT BIG Procedure manual)*.

Potential Bridge Closures

Existing bridges are widely dispersed throughout Hughes County and usually serve higher-volume routes. In most cases, nearby alternative routes that would facilitate closure of a poor performing bridge do not accompany the structures. Hughes County is taking a proactive look at each bridge to evaluate whether it is still warranted based on their long-range goals, priorities, and funding. The following criteria were used to help identify potential closure locations:

- **Redundant structures** – Locations where multiple bridges are within close proximity of each other, and the removal of a bridge would not have a significant impact to the road users. Typically, either a maintained crossing or a well-maintained route is available on the adjacent section line road.
- **Current bridge condition and type** – Current condition and bridge type were considered as to what may make sense to close from a fiscal standpoint. Current limitations in functionality such as width or weight restrictions were also considered.

Bridges that met the aforementioned criteria are identified in **Figure 12** and further described in **Table 5**. Bridges identified for future consideration to close involve passive closures. The bridge would remain open until closure is required due to bridge condition. (Note: structure 33268101 has been removed from the Hughes County bridge inventory.)

Table 4: Proposed Bridge Closures

Roadway	Roadway Jurisdiction	Structure Number	Waterway
310th Avenue	County	33300014	North Medicine Creek

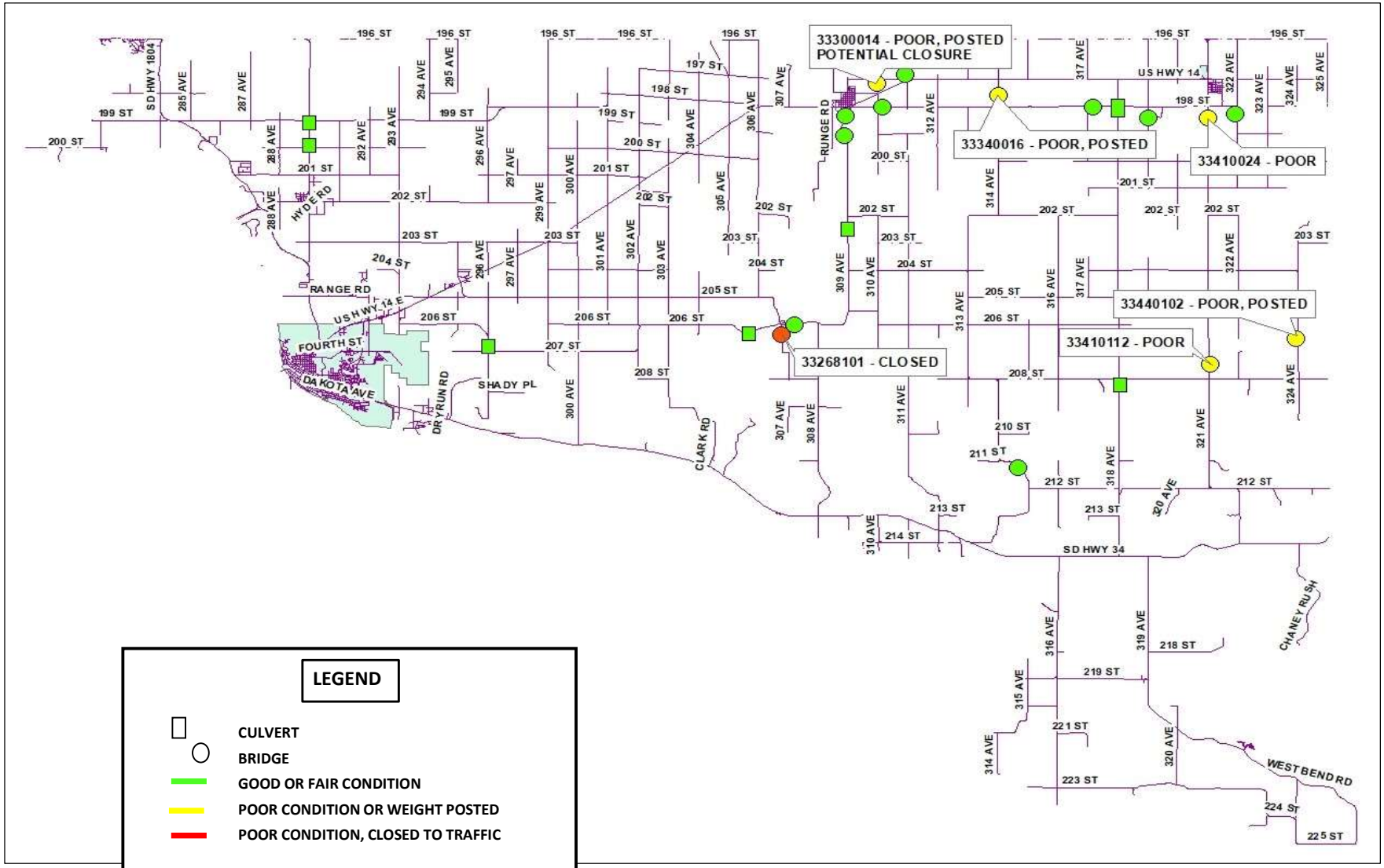
Future Needs Assessment

Bridges were evaluated for maintenance, preservation, and replacement as part of development of the Hughes County 5-Year Plan. The most recent 5-Year Plan, approved in September 2020, includes the following bridge improvement activities:

- Structure 33-410-112 (Bronemann's Bridge)
  - 2020: $25k local funding for preparation work
  - 2021: $10k local and $40k anticipated grant for preliminary engineering
  - 2023: $150k local and $600 anticipated grant for structure replacement

- Structure 33-410-024 (Reding Bridge)
    - 2020: $25k local for preparation work
    - 2021: $10k local and $40K anticipated grant for preliminary engineering
- Structure 33-440-102 (Husted Bridge)
    - 2020: $134k local, $217k federal, $351k state for structure replacement
- Structure 33-340-016 (Slaba Structure)
    - 2022: $200k local, $800 anticipated grant for structure replacement

While the current 5-Year Plan and the list of potential bridge closures address all the Hughes County structures that are currently in poor condition, they rely heavily on anticipated grant funding. If grant funding is not approved as currently programmed, the bridge projects would remain in the program but would shift to later years, including years beyond the current 5-Year Plan.



HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 12
BRIDGE LOCATION AND CONDITION

6. Roadway Preservation & Maintenance Plan

The Roadway Preservation and Maintenance Plan provides typical preservation and maintenance activities for asphaltic concrete, blotter, and gravel-surfaced roadways within Hughes County. This Plan illustrates the typical life cycle of these roadways, including typical preservation and maintenance activities, frequency, and costs applied to the identified needs of the system over the next 20+ years.

Roadway Preservation and Maintenance Planning

The Roadway Preservation and Maintenance Plan looks at the long-range aspect of incorporating new construction, reconstruction, preservation, and maintenance of roadways to help maximize the long-term investment of the Hughes County roadway network. This plan maps out the reconstruction, resurfacing, preservation, and maintenance activities for roadway segments, along with the respective frequency and estimated costs, throughout the anticipated design life of each asset. The output of this plan is directly translatable to the County's 5-year program and offers flexibility for the County to update as needed into the future.

A 'design life' is associated with each type of investment for planning and design purposes, representing the time from original construction to a state where reconstruction or replacement is needed. The realized design life can vary widely between separate segments consisting of the same element based on location-specific conditions such as traffic and truck volumes, roadway base thickness, subgrade conditions, environmental factors, and quality of construction and materials. The following lists planning-level design lives for various roadway elements assuming appropriate preservation and maintenance activities:

- Bridges and concrete culverts – 75 years
- Asphalt pavement – 20 years
- Concrete pavement – 40 years (jointed)
- Gravel surfacing – 8 years
- Signs – 15 years
- Pavement markings – 1 year for paint; 3 years (sprayable durable, grooved) to 7 years (plastic, grooved) for others

Planning-level preservation and maintenance activities are outlined in the following tables for asphaltic concrete, blotter, and gravel-surfaced roadways. The activities follow industry guidance and align with the standard practice for Hughes County roadways. Activity frequencies are based upon industry guidance for recommended treatment under average conditions and Hughes County experience. Unit costs reflect typical prices for contractor-performed work in Hughes County, with consideration to historical costs from the SDDOT statewide averages and other local input.

Table 5: Asphaltic Concrete Roadway Preservation and Maintenance Schedule

Activity	Frequency	Unit Cost
Chip Seal	6 years (year 3, 9, 15, 21*)	$20,000/mile
Crack Seal	6 years (same year as chip seal)	$3,000/mile
Mill 1.5" and Overlay 2"	20 years	$100,000/mile + structures
Mill 2" and Overlay 2"	20 years	$110,000/mile + structures
Mill 2" and Overlay 3"	20 years	$155,000/mile + structures
Pavement Markings	Annual	$1,000/mile (shared with SDDOT)
Patching/Annual Pavement Maintenance	Annual	$2,000/mile

**If overlay is not warranted, next chip seal would occur at year 21*

Table 6: Blotter Surfacing Preservation and Maintenance Schedule

Activity	Frequency	Unit Cost
Blotter Maintenance (chip seals)	3 years	$20,000/mile
Blotter Re-application	18 years	$60,000/mile

Table 7: Gravel Maintenance Schedule

Activity	Frequency	Unit Cost
Gravel Resurfacing – 3"	8 years	$20,000/mile
Blading	18 times/year	$900/mile
Spot Gravel/Annual Maintenance	Annual	$500/mile
Dust Control	1/year, as needed on select mile segments	$7,500/mile*

**$7,500/mile for year 1, $4,000/mile for year 2+*

Table 8: Miscellaneous Item Maintenance Schedule

Activity	Frequency	Unit Cost
Sign Maintenance	Annual	$115/mile
Sign Replacement	Assess at year 15 Blanket Replacement	$1,300,000*
General Maintenance**	Annual, as needed	$1,500/mile

**Blanket replacement full cost; Hughes County has participated in the SDDOT Countywide Signing Program funded at 100%*

***General maintenance includes snow removal, mowing, and other internal activities*

A representative life cycle of asphaltic concrete overlays, blotter surfacing, and gravel roads are shown in **Table 9**. Asphaltic concrete overlay and blotter surfacing includes chip seal and crack seals. General and routine maintenance, such as spot patches, pavement markings, sign maintenance, and blading of gravel roads is not included.

Table 9: Life Cycle Costs for Various Surface Treatments ($/mile)

Treatment Type	Year 0-5	Year 6	Year 8	Year 10	Year 15	Year 18	Year 20	Year 30	Year 40
AC Overlay (20 Yr. Cycle)	$123,000	$123,000	$123,000	$146,000	$169,000	$169,000	$269,000	$315,000	$438,000
AC Overlay (30 Yr. Cycle)	$123,000	$123,000	$123,000	$146,000	$169,000	$169,000	$169,000	$315,000	$361,000
Blotter (18 Yr. Cycle)	$60,000	$83,000	$83,000	$83,000	$106,000	$166,000	$166,000	$212,000	$272,000
Gravel Resurfacing (8 Yr. Cycle)	$20,000	$20,000	$40,000	$40,000	$40,000	$60,000	$60,000	$80,000	$120,000
Major Investment Activity Legend	*Initial Activity*					*Blotter Reapplication*	*Year of Overlay*	*Year of Overlay*	*Year of Overlay*

Costs are in current dollars per mile; shown amount indicates costs incurred that year for activity plus all costs up to that year.
The "AC Overlay" activity in years 0-5 includes an initial 1.5" Mill and 2" Overlay in year 0 ($100,000) and then Chip/Crack Seal in year 3 ($23,000).

Hughes County Road Condition Assessments

The Hughes County roadway network consist of many miles of gravel-surfaced roads and relatively few miles of hard-surfaced roads (either asphalt concrete or blotter). The condition of gravel-surfaced roads may change quickly depending on weather and maintenance. Consequently, County Highway staff have used records of ongoing inspection and maintenance to identify road improvement needs and guide project programming.

A review of existing road conditions was conducted as part of this study. The results of that review (**Appendix A**) show that the Hughes County road network is mainly in good condition, capable of serving the desired users without impediment or delay. The review, however, was conducted under dry winter conditions and represents a "snapshot" of road characteristics. Ongoing inspection and maintenance will be needed to continue to manage the roadway system in the future.

As more of the system is converted from gravel to asphalt surfacing, the need will grow to implement more sophisticated roadway management systems, particularly pavement management. Such systems require a baseline inventory and annual updates of network components and facilitate optimization of programmed expenditures.

7. Bicycle and Pedestrian Plan

The Bicycle and Pedestrian Plan provides a framework for incorporating multi-modal accommodations into the transportation network.

Introduction

The Hughes County Master Transportation Plan provides a comprehensive review and plan for countywide and regional transportation that includes motorized and non-motorized modes of travel. For non-motorized transportation travel, such as bicycling and walking, accommodations are most common to urbanized areas, shoulders on select US/State highways, and on the travel way of most County and Township roadways. This Plan identifies and prioritizes opportunities to improve multi-modal accommodations and address needs of the County while recognizing funding limitations and incorporating existing infrastructure.

Bicycle and Pedestrian Plan Objectives and Priorities

The Bicycle and Pedestrian Plan was developed to help guide Hughes County in multi-modal transportation funding decisions for the next 20+ years. The following objectives and priorities were established for the development of this Plan:

1. Provide an interconnected system of paths, trails, roadway lanes and routes that are multi-purpose, accessible, convenient, and connected within and to/from locations of high multi-modal accessibility demand.
2. Identify opportunities to incorporate feasible multi-modal improvements into existing infrastructure and future projects.
3. Form mutually beneficial partnerships with and among the public, cities, and private sector partners to expand and improve the accessibility of multi-modal services and facilities.

Key design elements of potential multi-modal facility improvements for Hughes County include:

- Shoulders along rural County highways
  - Minimum of 4-foot rideable surface width (clear width)
  - May be a designated bicycle lane in urban areas
- Shared-Use Path separated from roadway for bicycles and pedestrians
  - 10-foot width to accommodate 2-way pedestrian and bicycle traffic
- Sidewalk in urbanized areas
  - 5-foot minimum width
- Shared roadway/existing travel way on low-volume facilities

Further design information for these facilities is included in the Roadway Design, Analysis, & Policy Guidelines chapter.

Bicycle and Pedestrian Plan

Desired multi-modal accommodations vary widely, from regional bicycle routes where riders are comfortable riding next to high-speed traffic to pedestrian access separated from the roadway. The Bicycle and Pedestrian Plan provides a systematic approach to implementing feasible multi-modal improvements throughout the County by evaluating existing and projected needs and identifying appropriate improvements. The Hughes County Bicycle and Pedestrian Plan was prepared to mesh with the existing bicycle and pedestrian plan prepared by the City of Pierre.

With consideration to the aforementioned priorities and objectives, the Bicycle and Pedestrian Plan establishes a set of categories based on desired multi-modal accommodations to help guide future improvements.

- Rural Bicycle Routes
  - Primary Bicycle State Route with Paved Shoulder or Shared-Use Path
  - State Route with Limited Bicycle or Pedestrian Accommodations
  - County Route with Limited Bicycle or Pedestrian Accommodations
- Urban and Recreational Area Multi-Modal Facilities
- Proposed Projects

The proposed Bicycle and Pedestrian Plan is shown in **Figure 13**.

Rural Bicycle Routes

Rural bicycle routes have been identified to accommodate longer purpose-driven bicycle-trips, often regional or inter-city trips. Recreational bicyclists may also use these facilities, though there is a lower level of comfort to riding alongside high-speed vehicles on shoulders or within the travel lane. Pedestrian accommodations on these routes would be on the same surface location as bicyclists.

Primary Bicycle Route with Paved Shoulder or Shared-Use Path

Primary bicycle routes for inter-city and regional bicycle travel, typically US/State routes or trails constructed on abandoned railroad lines that provide regional route connectivity and continuity. These routes include wide paved shoulders (minimum of 4-foot wide) that accommodate bicycles outside of the through travel lane. In Hughes County, these facilities include SD 1804, and portions of US 14, US 83 and SD 34.

State Route with Limited Bicycle or Pedestrian Accommodations

This category identifies segments along the State system that currently exhibit a typical roadway section lacking shoulders wide enough to accommodate bicycles completely outside of the travel lane. In many instances, these roadway sections include a 28-foot paved surface (12-foot lanes and 2-foot shoulder) and turf shoulders. The following segments are recommended for consideration of shoulder improvements to enhance multi-modal connectivity as part of the next resurfacing or improvement project: portions of US 14 and SD 34.

County Route with Limited Bicycle or Pedestrian Accommodations

Hughes County-jurisdiction roadways with gravel surfacing provide limited opportunities for bicycle mobility and may be difficult for pedestrian travel.

Urban and Recreational Area Multi-Modal Facilities

Urban and Recreational Areas represent areas of higher multi-modal demand that may require a multi-faceted approach to provide facilities for a wide variety of users. The following areas have been identified in Hughes County

- Pierre area
- Pierre – Farm Island multi-modal trail

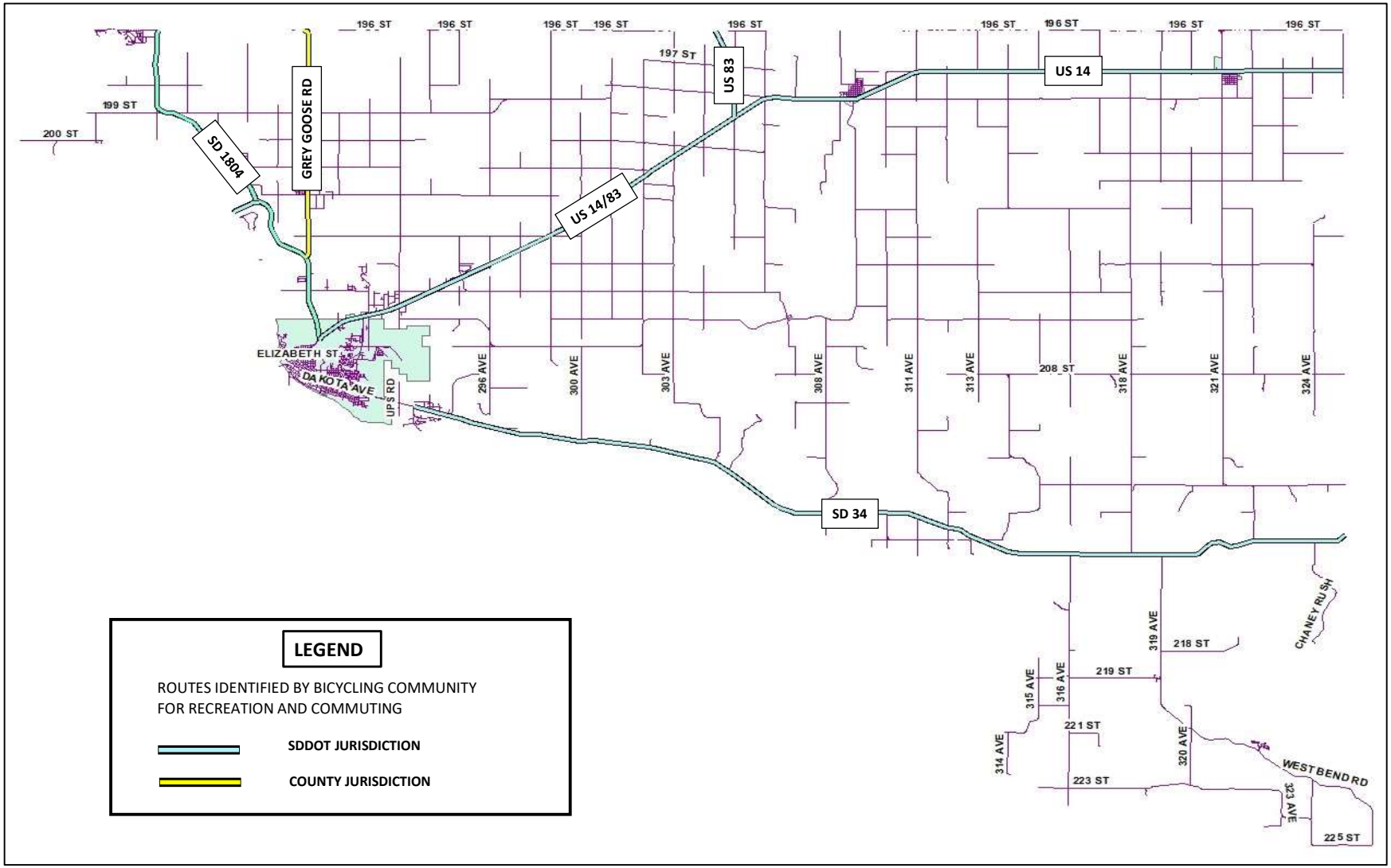
Municipalities within the County also exhibit a concentrated demand for bicycle and pedestrian facilities. While much of this falls within the local City jurisdiction, developing urban fringe areas often do not have the multi-modal amenities and connectivity that are typically established in the cities.

Users of facilities in these areas will likely vary with regard to trip purpose, experience, and comfort level around vehicular traffic. Therefore, this Plan illustrates a multi-modal approach in Urban and Recreational Areas of incorporating off-street facilities, such as sidewalks or share-use paths, in addition to paved shoulders on designated bike routes as identified in the more rural areas. Connectivity and continuity of facilities with similar elements helps accommodate the variety of users expected in these areas and avoiding multi-modal barriers or 'islands' that lack internal connections to/from the areas where the demand originates.

Implementation Considerations

The installation of countywide bicycle and pedestrian facilities is a prohibitively difficult and expensive undertaking if done within a short timeframe. Implementation of proposed bicycle and pedestrian improvements should be undertaken through an incremental process that leverages existing infrastructure and prioritizes improvements to enhance connectivity for non-motorized travel.

Improvements or new facilities identified in this Bicycle and Pedestrian Plan should be considered as opportunities arise. Many of these locations, particularly roadway segments identified for shoulders, have a companion roadway improvements project where multi-modal improvements could coincide with improvements to the roadway.



HRGreen

HUGHES COUNTY MASTER TRANSPORTATION PLAN

FIGURE 13
BICYCLE AND
PEDESTRIAN PLAN

8. Roadway Design, Analysis, & Policy Guidelines

Design and development standards related to transportation are contained in ordinances and policies maintained by Hughes County. Roadway design is also governed by standards propagated by SDDOT and the American Association of State Highway and Transportation Officials (AASHTO). In particular, Hughes County relies on the SDDOT Local Roads Plan (2011) as the standard for design of Hughes County roadways.

A review was conducted of the Hughes County ordinances and policies pertaining to transportation and revisions were recommended, as follows:

- Revisions were recommended to the following ordinances:
  - Ordinance 96-4 (right of access to county roads)
  - Ordinance 1997-3 (off-street parking)
  - Ordinance 2000-01, article 4 (preliminary plans)
  - Ordinance 2001-01, article 8 (section line standards)
  - Ordinance 2001-01, article 13 (plat certification of highway access)
- New Engineering Design Standards document
- New Traffic Impact Study procedures
- Pavement policy guidance memo
- Level of Service policy guidance memo

Ordinance and policy reference material is contained in **Appendix C**.

Roadway Safety Improvements

A review of crash history throughout Hughes County between 2014 and 2018 indicated that nearly 90 percent of the 93 reported crashes involved only a single vehicle (typically a roadway departure) or animal crashes. The other 10 percent involved a collision between at least two vehicles, which reflects the rural nature of the County and limited exposure of vehicle-vehicle conflicts. Overall, nearly 34 percent of the crashes were vehicle-animal crashes. Discernable trends were difficult to ascertain as the vehicle-animal crashes and roadway departure crashes tended to be scattered in a random nature across the County.

In 2019, the SDDOT released the updated South Dakota Strategic Highway Safety Plan to provide a comprehensive, statewide approach to addressing roadway and roadside safety. The plan utilizes a data-driven, multi-year framework to reduce fatal and serious injury crashes. Seven safety emphasis areas were identified, regarding respective issues, goals, actions, and priority safety strategies:

- Roadway Departure
- Intersections
- Motorcycles
- Unbelted Vehicle Occupants
- Speeding-Related
- Drug- and Alcohol-Related
- Young Drivers

In an effort to reduce the fatal and serious injury crash rates, Hughes County should continue to partner with the SDDOT and South Dakota Department of Public Safety to integrate safety improvement efforts with the process, guidelines, and strategies identified in the latest version of the South Dakota Strategic Highway Safety Plan. In collaboration with other local agencies, these partnerships will assist in providing a comprehensive approach to preventing and reducing the severity of crashes on all roadways throughout Hughes County.

A network-wide, programmatic approach of continually improving roadway surface and roadside features is a proactive measure in helping reduce severity of random roadway departure crashes. This involves a combination of upgrading roadway segments to meet current design standards, spot safety improvements, or safety improvements integrated into larger maintenance, preservation, and reconstruction projects

Further guidance on safety strategies is available at the following:

- SDDOT Strategic Highway Safety Plan http://sddot.com
- FHWA Office of Safety http://safety.fhwa.dot.gov
    - FHWA Proven Safety Countermeasures http://safety.fhwa.dot.gov/provencountermeasures
    - FHWA Local and Rural Road Safety Program http://safety.fhwa.dot.gov/local_rural
- AASHTO Roadside Design Guide

Railroad Crossings Safety Improvements

Railroad crossings are primarily located along the Rapid City, Pierre and Eastern Railroad that runs roughly west to east across the County. Nearly 50 public roadway-rail crossing intersections are currently noted within Hughes County.

While no vehicle-train crashes have been reported in Hughes County since 2017, conflicts at low volume crossings often entail random circumstances and causal factors. However, while there may not be a historical trend in crashes at a particular crossing (often due to this limited train-vehicle exposure), underlying safety issues may still be present that create risks for both the motorist and train.

It is recommended that continual improvements be applied to existing and any new crossings in the future based on the random nature of these crashes. New proven safety measures and technology improvements are continuously evolving through research and implementation. One aspect of a continual railroad improvement program is identification of potential vehicle-train, pedestrian-train, and vehicle-vehicle conflict points. Consideration to vehicle-train crash causal factors as well general traffic operations and meeting driver expectancy should be accounted for in future designs and modifications of existing crossings. These considerations include such items as:

- Crossing geometrics: Intersection skew, sight distance, proximity to driveways, etc.
- Crossing control: Gates, flashing lights, cross-bucks, etc.
- Provide smooth crossings
- Remove rails from abandoned tracks at a crossing
- Pavement markings
- Pavement condition/crossing condition
- Excessive vehicle speeds
- Traffic signal preemption timing
- Detection of blocked crossings for emergency responders
- Pedestrian crossings

Traffic Control Warrants

The Manual on Uniform Traffic Control Devices (MUTCD) contains the basic principles that govern design and use of traffic control devices for public streets and highways. The MUTCD should be used to evaluate the design and proper traffic control device for each intersection and roadway, using the following guidelines (see MUTCD 2009 Edition for additional guidance).

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 traffic control signal needs studies, the standard, guidance, and options is provided in the latest edition of the MUTCD.

Turn Lane Warrants

Along highway segments with high traffic volumes or a relatively high volume of large turning vehicles, it is often advantageous to install turn lanes at unsignalized intersections to improve intersection operations and safety. The primary benefit is removing turning traffic from the through travel lane and reducing the risk of rear-end crashes. Removing turning traffic from the through lane also improves intersection operations by reducing the amount of delay a vehicle would experience if a turning vehicle slowing or waiting for a gap in traffic blocked the through lane.

The SDDOT Road Design Manual details considerations for the installation of a left- and right-turn lane at unsignalized intersections. These considerations are applicable at all types of roadway or driveway intersections and work hand-in-hand with established access management policies and County ordinances.

At unsignalized intersections, the following items are recommended for consideration in the determination of whether a left-turn lane is warranted:

- Traffic volume
  - Left-turn volume (vehicles per hour)
  - Opposing and advancing volume (in design hour)
- Crash history
- Special cases, when applicable
  - Railroad crossings
  - Geometric/Safety concerns
  - Presence of non-traversable medians

For the evaluation of right-turn lane warrants, the following items are recommended for consideration:

- Traffic volume
  - Right-turn volume (vehicles per hour)
  - Opposing and advancing volume (in design hour)
- Crash history
- Special cases, when applicable
  - Railroad crossings
  - Geometric/Safety concerns

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.

In all instances, access spacing and current roadway design standards apply to the design and installation of a turn lane. The design shall safely accommodate the necessary process of the turning movement and not create new safety issues. The process for application and assessment of turn-lane warrant criteria is outlined in detail within Chapter 15, Traffic, of the SDDOT Road Design Manual.

Traffic Analysis Guidelines

Traffic Operations Analysis Thresholds

It is recommended that Hughes County establish minimum acceptable operational thresholds using methodology consistent with SDDOT guidelines in the analysis of existing or planning-year traffic conditions. The most current edition of the Highway Capacity Manual quality of service measures of highway facilities and intersections in relation to traffic demand is described through a Level of Service (LOS) rating.

The two most common operational measures applicable to Hughes County include the assessment of rural/urban fringe two-lane highways and intersections. The Highway Capacity Manual 6th Edition (HCM6) calculates the estimated percent time spent following and average travel speed along an analysis-determined two-lane highway segment and relates it to LOS criteria. The HCM6 measures intersection operations in terms of control delay (average delay per vehicle) for signalized, two-way stop-controlled (TWSC), all-way stop-controlled (AWSC), and roundabout intersections. At signalized intersections, the LOS criteria are based on the overall average delay of the intersection. At stop-controlled and roundabout intersections, the operational threshold is based on the worst-case stop-controlled approach.

For traffic analysis and studies in Hughes County, the recommended minimum operating conditions in existing conditions or a future planning condition is:

- Two-lane highway segments
  - LOS C
- Intersections
  - LOS C

Multi-modal analyses are also applicable to two-lane highway and intersection operational analyses. The latest version of the HCM provides guidance on how to assess bicycle and pedestrian LOS where applicable, helping an analyst or designer gauge multi-modal accommodations at a specific location. Bicycle and pedestrian LOS scores are developed based on traveler perception models developed for the HCM. As multi-modal LOS guidelines for use in the analysis of alternatives is still being developed and continually refined, it is recommended that Hughes County consult the latest guidance provided in the SDDOT Road Design Manual and HCM.

Traffic Impact Studies

A Traffic Impact Study (TIS) is a comprehensive analysis of before and after operational impacts to the surrounding roadway system due to additional traffic volume or shifts in travel patterns from new development of modified land use. The preparation of a TIS will assist Hughes County in properly assessing these impacts and identifying improvements or other mitigation measures to continue to provide safe and efficient mobility throughout the County.

Recommended Traffic Impact Study procedures were prepared for Hughes County. The procedures are provided in **Appendix C**.

Hughes County Access Management Guidelines

Access management is the process of providing safe, efficient ways of turning onto and off public roads and highways[6]. It entails the planning, design, and implementation of land use and transportation strategies to maintain a safe flow of traffic while accommodating the access needs of the adjacent development. Management of roadway access, in terms of cross-street spacing and driveway placement, is a critical means of preserving and enhancing a roadway's intended function and aids efficient operation. Additionally, providing access management in some form – such as grade separated crossings, frontage and backage roads, or right-in/right-out access – reduces the number of vehicle conflict points and improves safety along the corridor.

Studies have demonstrated a direct relationship between the number of access points and the rate of crashes, showing a positive correlation between access density (access points per mile) and the frequency of crashes (crash rates).[7] Given this relationship, access management is an important roadway safety tool that can provide many benefits to the corridor, such as:

- Reduce crashes
- Preserve road capacity and postpone the need for roadway widening or other capital improvements
- Improve travel times for the delivery of goods and services
- Ease movement between destinations
- Support local economic development

[6] South Dakota DOT Roadway Design Manual, Chapter 17 – Access Management, pg. 17-2

[7] Safety Effectiveness of Highway Design Features, Volume I: Access Control (FHWA-RD-91-044), Federal Highway Administration, 1992.

Recommended Access Management procedures are provided in the Engineering Design Standards contained in **Appendix C**.

Another component of access management is maintaining adequate separation between private driveways and the nearest adjacent roadway intersection. This minimum separation is referred to as the 'minimum corner clearance' and defines the distance between the radius return point of the intersection and the first adjacent driveway. The minimum corner clearance concept accounts for a motorist's perception-reaction time of downstream conflicts, which is an integral component to stopping sight distance requirements in roadway design.

Minimum clearance between a cross-street and driveway also helps minimize private access breaks and conflict points within an intersection's functional area. The functional area of an intersection is representative of the area in which upstream and downstream maneuvers are influenced or impacted by activity within the intersection. This area includes intersection lane channelization and associated storage length and the taper/maneuver area for separate turn lanes. Overall, the functional area is considered much larger than the physical area of the intersection.

Maintaining desired corner clearance is of particular importance in developing rural and urban fringe areas, where the County can establish desired access management as the area develops.

Recommended minimum upstream corner clearance guidelines are provided in **Table 10**.

Table 10: Hughes County Minimum Upstream Corner Clearance Guidelines

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

SDDOT Road Design Manual

Bicycle and Pedestrian Facility Design Guidelines

The Bicycle and Pedestrian Plan outlines long-term goals for multi-modal accessibility throughout the County. The following provides recommended design guidance in the development of bicycle and pedestrian facilities throughout Hughes County in support of the Bicycle and Pedestrian Plan.

Shared-Use Path

A shared-use path is a designated facility for non-motorized travel separated from roadway traffic. Common locations of shared-use paths are parallel to a motor vehicle roadway near the right-of-way line or on a separate alignment such as on abandoned railroad grade or through recreational areas. When available space is constrained due to limited right-of-way, water crossings, or other situations that restrict the available width, a side path may be constructed adjacent to the roadway that is an extension of the shared-use path. Two typical cross-sections representative of a shared-use path are provided in **Table 11**:

- Shared-use path on independent alignment
- Shared-use path parallel to roadway

Recommended minimum shared-use path surfacing thickness is shown in **Table 11**.

Table 11: Recommended Minimum Shared-Use Path Surfacing Thickness

Surfacing Type	Base	Surfacing Thickness
Asphaltic Concrete with Aggregate Base	4" Aggregate	2.5"
Portland Cement Concrete with Aggregate Base	4" Aggregate	4" PCC (jointed)
Shoulder	-	Turf or Aggregate

Highway Shoulders

Highway shoulders of sufficient width and delineation provide travel ways for bicyclists and pedestrians along County highways in addition to providing motor vehicle safety and operational benefits. These facilities should be located along common bicycle routes throughout Hughes County, particularly near urban, recreational, and other high multi-modal demand areas as identified in the Bicycle and Pedestrian Plan.

A minimum of four feet of smooth, rideable/walkable paved shoulder width should be provided for a multi-modal shoulder. The installation of rumble strips/stripes between the edge of travel lane and shoulder should incorporate the following:

- Shoulder width of 4 feet or less
  - 8-inch wide rumble stripes, placed on edge of travel lane
- Shoulder width of greater than 4 feet
  - 12-inch wide rumble strip, placed adjacent to edge of travel lane on shoulder

In all instances, rumble strips/stripes on bicycle routes should consist of a 60-foot cycle pattern of 48-feet of rumble strip/stripe and a 12-foot gap.

For locations of high pedestrian demand, shoulders should maintain less than a two percent cross-slope to meet accessibility requirements.

Bicycle and Pedestrian Facility Design Guidance

Further guidance and best practices in the design of shared-use paths and highway shoulder accommodations is provided in the latest versions of the following documents:

- A Policy on Geometric Design of Highways and Streets (AASHTO)
- Guide for Planning, Design, and Operation of Pedestrian Facilities (AASHTO)
- Guide for the Development of Bicycle Facilities (AASHTO)
- SDDOT Road Design Manual

9. Transportation Funding

Existing conditions for the Hughes County transportation infrastructure were inventoried in order to identify transportation related issues and opportunities. This inventory included a review of the existing roadway network, traffic volumes and operations, crash history, non-motorized transportation facilities, transit service, airport and freight facilities. The following sections summarize the key findings of this review.

Annual Funding Need

The Hughes County Master Transportation Plan outlines current and future needs throughout the Hughes County transportation network over the next 20+ years. An annualized cost scenario was developed to bring the various needs and transportation components together into a countywide needs assessment. **Table 12** outlines the annual and 20-year funding need for this scenario in terms of 2019 dollars.

Table 12: Annual Funding Needs over Next 20 Years (2019 Dollars)

Category	Estimated Annual Need (2019 $)
Regular Maintenance	$1,350,000
Periodic Chip Seal Maintenance	$190,000
Bridge Repair	$50,000
Bridge Replacement	$140,000
Roadway Construction	$1,100,000
Total (Year 1)	**$2,830,000**
Total 20-Year Need	**$56,600,000**

Recognizing that transportation funding needs will continue to increase as construction costs increase, year of expenditure costs were estimated for year 2040 using a 2% annual inflation rate. As shown in **Table 13**, the estimated annual funding need to continue maintaining the network, per the potential scenarios, increases by nearly 50 percent by 2040.

Table 13: Funding Need in Year 2040 (YOE Dollars)

Category	Maintain Existing Network (2040 $)
Regular Maintenance	$2,050,000
Periodic Chip Seal Maintenance	$288,800
Bridge Repair	$76,000
Bridge Replacement	$212,800
Roadway Construction	$1,672,000
2040 Total (Year 20)	**$4,299,600**
Total 20-Year Need (YOE) (2020 – 2040, with inflation)	**$85,992,000**

County Road and Bridge Fund Revenue Sources

The primary annual sources of Hughes County road and bridge funding are County General Funds, Motor Vehicle Licenses, Wheel Tax, and annual allocation of State funds. Additional funding sources are available to Hughes County, but are typically competitive grant-based awards such as the Bridge Improvement Grant or emergency-based programs. The following provides a brief summary of the typical Road and Bridge funding sources.

County General Funds

Hughes County provides an annual transfer of property tax revenue from the General Fund to the County road and bridge account.

Motor Vehicle License Fees

Motor Vehicle License Fees are collected by Hughes County and a portion is retained by the County. The remainder is sent to the State of South Dakota for distribution.

County Wheel Tax

Hughes County currently assesses a wheel tax, which is retained by Hughes County and deposited into the road and bridge account.

Annual Surface Transportation Block Grant (STBG) Funding

Prior to 2015, federal STP funds were allocated to all Counties in South Dakota through the SDDOT. Counties had the option to let funds accumulate until they needed them to implement a project, or they could exchange their STP funding with State funds on a 90:10 ratio. Beginning in 2015, the State of South Dakota has discontinued the accumulation element and now exchanges all Federal STBG funding to be allocated to Counties with State funds at a 90:10 ratio. The State funds are allocated to the Counties in the form of a check to allow greater flexibility in roadway or bridge project implementation, including repair or maintenance.

Other Annual Revenue Sources

A series of other small annual funding sources and maintenance contracts round out the remaining annual revenue sources for the County road and bridge account. Small funding sources include items such as mobile home fees, motor fuel tax adjustments disbursed by the State of South Dakota, and licenses and permits. Maintenance contracts are typically with Townships or municipalities on an as-requested basis for County services.

State and Federal Grants

One-time funding mechanisms are available to local counties and municipalities through Federal and State funding programs, often in the form of grants. These grants often vary by highway funding bill, particularly on the Federal level, but may be available to help fund individual projects such as transportation alternatives (shared-use paths, bicycle lanes, trails, etc.), emergency repairs, or economic development-driven projects.

State Infrastructure Bank Loans

SDDOT has established a State Infrastructure Bank to assist local governments in financing infrastructure improvements. The program provides loans, subject to policies and funding availability.

Future County Road and Bridge Fund Revenue Sources

Hughes County forecasts revenue sources for the next five years as part of its annual Five-Year County Highway and Bridge Improvement Plan. Information from the revenue forecast is summarized in **Table 14**.

Table 14 – Forecast Revenue ($1,000)

Account Description	2020	2021	2022	2023	2024
Local Funds					
Wheel Tax	200.0	200.0	200.0	200.0	200.0
STP allocation	147.0	147.0	147.0	147.0	147.0
State Funds	413.7	80.0	800.0	600.0	0.0
Federal Funds	289.0	0.0	0.0	0.0	0.0
Intergovernmental Funds					
Fuel Tax	58.5	58.5	58.5	58.5	58.5
MV Licenses	1,500.0	1,500.0	1,500.0	1,500.0	1,500.0
Other	85.6	85.6	85.6	85.6	85.6
Public Works Funds	14.5	14.5	14.5	14.5	14.5
Miscellaneous Funds	31.4	31.4	31.4	31.4	31.4
Other Funds					
Transfer from General	600.0	600.0	600.0	600.0	600.0
Other	95.0	95.0	95.0	95.0	95.0
Total	**3,434.7**	**2,812.0**	**3,532.0**	**3,332.0**	**2,732.0**

Transportation Needs and Available Funding

Local, state, and federal funding was forecasted out over the next 20 years based on Hughes County funding forecasts and historical data. For the baseline funding conditions, no additional funding from the 2015 Highway Funding Bill was incorporated. However, it was assumed that Hughes County would be successful in being awarded BIG funding for preliminary engineering and bridge construction for several structures during the plan period. It was also assumed that Hughes County would be awarded a small bridge preservation grant every other year and the SDDOT signing program would cover a blanket sign replacement in the next 20 years.

A comparative look at where the forecasted funding falls within the planning-level costs for the identified transportation network needs is provided in **Table 15**. Projected costs are presented to illustrate the short-term and long-term comparison to forecasted funding. Projects and funding already determined in the Five-Year County Highway and Bridge Improvement Plan (2020-2024) are shown in the first column. One possible funding scenario is shown for the years 2025-2040. Regular maintenance spending is funded in each year and the remaining forecast funds are allocated to several identified project needs. The available funds are insufficient to fully fund all the project needs through 2040, indicating the need for additional funding through grants, loans, assistance programs or other sources. **Table 15** shows one possible scenario for project funding, but other scenarios may be developed, depending on changing County needs.

As shown, the forecasted funding representative of the baseline conditions is expected to be short in fully addressing the identified needs to both scenarios at some point over the next 20 years. However, the time when that would occur is highly dependent on the actual rate of material and construction cost inflation.

TABLE 15 - FUNDING PROFILE

HUGHES COUNTY MTP

	YEAR																
PROJECT NEED	**2020-2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
REGULAR MAINTENANCE	$7,897.90	$1,350.00	$1,820.00	$1,350.00	$1,350.00	$1,820.00	$1,350.00	$1,350.00	$1,820.00	$1,350.00	$1,350.00	$1,820.00	$1,350.00	$1,350.00	$1,820.00	$1,350.00	$1,350.00
NEW ROAD - PUTNAM'S	$75.00																
NEW ROAD - FALCON RIDGE	$50.00																
BRIDGE REPAIR - BRONEMANN'S	$25.00																
BRIDGE REPAIR - REDING	$25.00																
BRIDGE REPLACEMENT - HUSTED	$702.00																
RR CROSSING - 321ST ST	$69.50																
PE BRIDGE REPLACEMENT - REDING	$50.00																
PE BRIDGE REPLACEMENT - BRONEMANN'S	$50.00																
BRIDGE SLAB - SLABA	$1,000.00																
STRUCTURE REPLACEMENT - BRONEMANN'S	$750.00																
ASPHALT & BASE - 318TH AVE																	
ASPHALT & BASE - CANNING RD																	
CHIP SEAL & BASE - HOLLY RD																	
ASPHALT BASE & GRADING - BEASTROM RD																	
GRAVEL & GRADING - N. CANNING RD.																	
REGRADING - 205TH ST & 296TH AVE		$400.00															
ASPHALT - BY COUNTY SHOP				$400.00													
ASPHALT & BASE - LANDFILL ROAD														$3,600.00			
BLOCK OFF-ROAD TRAVEL - WINDSOR PL		$10.00															
UPS ROAD DESIGN & CONSTRUCTION																	$850.00
198TH ST INTERSECTIONS # US 14/83																	$150.00
RANGE RD - REBUILD TO RURAL ARTERIAL																	
KINGSWAY RD - REBUILD TO RURAL ARTERIAL																	
TOTAL NEED	$10,694.40	$1,760.00	$1,820.00	$1,750.00	$1,350.00	$1,820.00	$1,350.00	$1,350.00	$1,820.00	$1,350.00	$1,350.00	$1,820.00	$1,350.00	$4,950.00	$1,820.00	$1,350.00	$2,350.00
PROJECT FUNDING																	
LOCAL	$8,511.85																
FEDERAL	$289.00																
STATE	$413.55																
ANTICIPATED GRANT	$1,480.00																
TOTAL AVAILABLE FUNDING	$10,694.40																
ANNUAL AVERAGE FUNDING																	
LOCAL		$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00	$1,700.00
FEDERAL		$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00	$58.00
STATE		$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00
TOTAL AVERAGE FUNDING		$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00	$1,843.00
FUND BALANCE		$83.00	$106.00	$199.00	$692.00	$715.00	$1,208.00	$1,701.00	$1,724.00	$2,217.00	$2,710.00	$2,733.00	$3,226.00	$119.00	$142.00	$635.00	$128.00

Other Potential Funding Sources

It is recommended that Hughes County leverage alternative funding and agency assistance opportunities as feasible, such as Federal programs, grants, research, and multi- or cross-program opportunities. In many instances, these programs are competitive for award of funding; thus, the County should research and evaluate each program prior to submittal.

Administered through South Dakota Department of Transportation

- Bridge Improvement Grant (BIG) Fund
- Transportation Alternatives Program (TAP)
- Highway Safety Improvement Projects (HSIP), in conjunction with the South Dakota Strategic Highway Safety Plan
- State Planning and Research Program (programs for STP Recipients or Small Communities; for planning related activities)
- Transportation Economic Development Grants

Project and Funding/Effort Assistance

- South Dakota State University
- Southeast Technical Institute or Mitchell Technical Institute
- Local Transportation Assistance Program (LTAP)
- Central South Dakota Enhancement District
- Resource Directory – South Dakota Governor's Office of Economic Development

Multi-Modal and Other Funding Opportunities

- U.S. Department of Transportation (including Federal Highway Administration) Discretionary Programs
    - *Many of these were discontinued with the latest Federal funding bill, but something to consider in the future when new bills are approved*
- Federal Bicycle and Pedestrian Funding Opportunities
    - http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm
- Bicycle/Pedestrian Grants
    - Many are available, competitive, and fund projects at various levels
    - Example grant-based organization includes People for Bikes : http://www.peopleforbikes.org/

Loan Programs

- State Infrastructure Bank (SIB) Loans – 0 percent interest loans of federal funds for projects on federal-aid routes.
- State Highway Fund Loans (SHFL) – industrial or agricultural business-type projects on non-federal-aid routes for Counties and Class I cities.

10. Project Implementation Plan

The implementation plan was developed through a collaborative effort between Hughes County, the South Dakota Department of Transportation, and public and stakeholder input. The goal of this implementation plan is to provide recommendations of feasible transportation projects that address Hughes County's long-term transportation needs, supplementing the Major Roads Plan, Bridge Plan, Preservation and Maintenance Plan, and Bicycle and Pedestrian Plan. The actual implementation of these projects is highly dependent on the availability of financial resources.

Project Development

Through an assessment of the existing Hughes County transportation network, future needs, available resources, and public and stakeholder input throughout the process, the Hughes County Master Transportation Plan identifies five overarching categories for transportation needs throughout the existing network, each often encompassing multiple specific needs. These five categories are as follows:

- Bridge Condition
- Roadway Surfacing
- Multi-Modal Accommodations
- Growth Areas
- Drainage

The Hughes County Master Transportation Plan was developed to provide a systematic means for establishing goals and objectives, evaluating existing and future-year conditions, and providing a prioritized set of projects for implementation through the following Plan elements:

- Major Roads Plan
- Bridge Plan
- Bicycle and Pedestrian Plan
- Roadway Preservation and Maintenance Plan
- Roadway Design, Analysis, and Policy Guidelines

Using this systematic approach towards project identification, evaluation, and selection, supplemented with public and stakeholder involvement throughout the process, a series of proposed projects were identified and prioritized for implementation over the next 20+ years.

Project Implementation

The Hughes County Master Transportation Plan illustrates a two-part implementation plan:

1. Maintain the existing transportation network in line with the Major Roads Plan, Bridge Plan, and Roadway Preservation and Maintenance Plan
    a. Reflects the 'core' implementation elements to maintain a similar level of service on Hughes County highways
2. Implement capital improvements to address additional needs and enhance the transportation network
    a. Reflects 'supplemental' planning elements such as intersection, roadway segment, and multi-modal facility improvements to enhance the existing transportation network

The implementation tables include planning level cost estimates based on current industry planning-level estimating procedures, combined with SDDOT and Hughes County input on recent project costs and locality adjustments.

Core Implementation Elements to Maintain Existing Transportation Network

The core implementation elements look at maintaining a transportation network pursuant to the overarching goals and framework outlined in the Major Roads Plan. The hallmark of this approach is to apply proactive maintenance and preservation activities to extend the useful life of each roadway and bridge investment. When replacement or a significant investment is warranted, the plan identifies opportunities to evaluate alternatives with the long-term goal of providing a sustainable transportation network.

Roadways

Maintaining the existing roadway network involves periodic maintenance activities depending on the roadway surfacing. Gravel roads undergo annual grading and shaping, with periodic applications of additional gravel and magnesium chloride surface treatment. Blotter surfaced roadways receive chip-seal treatments in a three-year cycle. Asphalt surfaced roadways receive periodic chip-sealing and mill-overlay maintenance as needed.

Bridges

Bridges are periodically inspected to determine maintenance and reconstruction needs. The inspections result in small maintenance projects and larger projects that may qualify for funding through the SDDOT BIG (Bridge Improvement Grant) program.

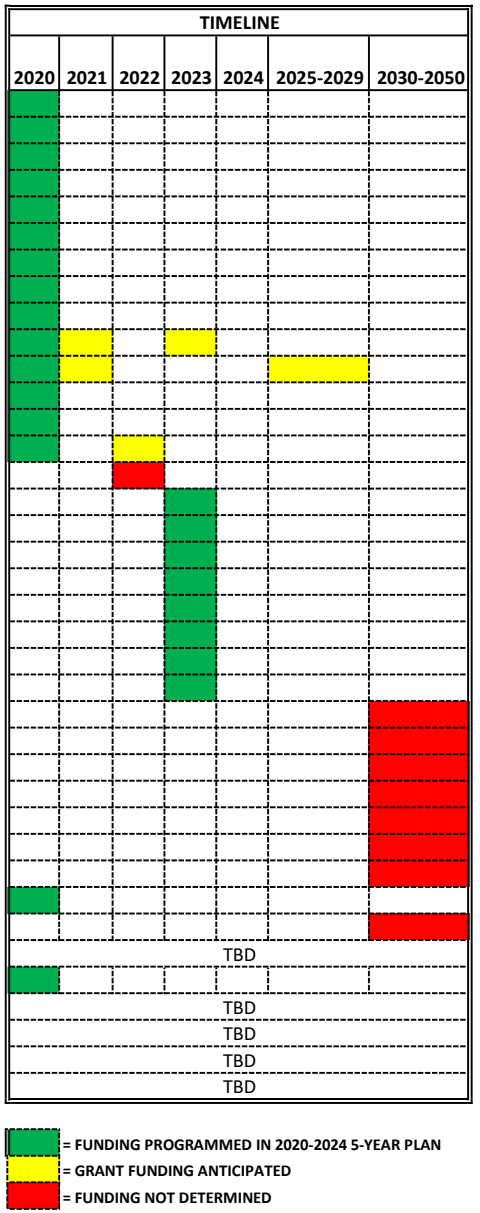
Transportation Network Enhancement Projects

Transportation network enhancement projects are geared towards addressing the identified transportation issues and needs, focusing on enhancing the transportation network and supplementing the core implementation elements to maintain the existing network. These projects are included with already-programmed projects in **Table 16,** also identifies which year funds may be available, based on one project selection scenario.

TABLE 16 - PROJECT PROGRAM

HUGHES COUNTY MASTER TRANSPORTATION PLAN

PROJECT	2020-2024 PLAN			NOTES
	INCLUDED IN PLAN?	YEAR	FULLY FUNDED?	
CHIP SEAL AND STRIPING - SPRING CREEK	YES	2020	YES	
CHIP SEAL - HOLLY	YES	2020	YES	
CHIP SEAL - RANGE ROAD	YES	2020	YES	
CHIP SEAL - KINGSWAY	YES	2020	YES	
CHIP SEAL - CAMELOT	YES	2020	YES	
CHIP SEAL AND STRIPING - WEST BEND	YES	2020	YES	
CHIP SEAL AND STRIPING - GREY GOOSE ROAD	YES	2020	YES	
PUTNAM'S - CONSTRUCT NEW ROAD	YES	2020	YES	
FALCON RIDGE - CONSTRUCT NEW ROAD	YES	2020	YES	
BRONEMANN'S BRIDGE REPAIR	YES	2020-2023	NO	ANTICIPATING GRANTS- 2021, 2023
REDING BRIDGE REPAIR	YES	2020-2021	NO	ANTICIPATING GRANTS - 2021, 2029
HUSTED BRIDGE REPLACEMENT	YES	2020	YES	
321ST AVENUE RAILROAD CROSSING	YES	2020	YES	
SLABA STRUCTURE REPLACEMENT	YES	2022	NO	ANTICIPATING GRANT - 2022
ASPHALT & BASE - 17.5 MILES OF 318 AVE	YES	2022	NO	CURRENTLY UNFUNDED, PROGRAMMED 2022
MAG WATER SURFACE TREATMENT - LANDFILL ROAD	YES	2023	YES	
CHIP SEAL AND STRIPING - SPRING CREEK	YES	2023	YES	
CHIP SEAL - HOLLY	YES	2023	YES	
CHIP SEAL - RANGE ROAD	YES	2023	YES	
CHIP SEAL - KINGSWAY	YES	2023	YES	
CHIP SEAL - CAMELOT	YES	2023	YES	
CHIP SEAL AND STRIPING - WEST BEND	YES	2023	YES	
CHIP SEAL AND STRIPING - GREY GOOSE ROAD	YES	2023	YES	
ASPHALT & BASE - 5 MILES OF CANNING ROAD	YES	2024	NO	ESTIMATED FUNDING AVAILABLE 2048
CHIP SEAL & BASE - 2 MILES OF HOLLY ROAD	YES	2024	NO	ESTIMATED FUNDING AVAILABLE 2035
ASPHALT, BASE, GRADING - 3 MILES OF BEASTROM ROAD	YES	2024	NO	ESTIMATED FUNDING AVAILABLE 2035
GRAVEL & GRADING - 5.5 MILES OF NORTH CANNING ROAD	YES	2024	NO	ESTIMATED FUNDING AVAILABLE 2048
REGRADING - 9 MILES OF 206 ST AND 296 AVE	YES	2024	NO	ESTIMATED FUNDING AVAILABLE 2032
ASPHALT - 1 MILE BY COUNTY HIGHWAY SHOP	YES	2024	NO	ESTIMATED FUNDING AVAILABLE 2032
ASPHALT & BASE - 9 MILES OF LANDFILL ROAD	YES	2024	NO	ESTIMATED FUNDING AVAILABLE 2032
BLOCK OFF-ROAD TRAVEL - WINDSOR PL TO BUHL AVE	NO	--	NO	MAINTENANCE-LEVEL PROJECT
UPS ROAD DESIGN AND CONSTRUCTION	NO	--	NO	ESTIMATED FUNDING AVAILABLE 2035
198 ST INTERSECTIONS AT US 14 AND US 83	NO	--	NO	PURSUE JOINT PROJECT WITH SDDOT
198 ST MILL ASPHALT AND GRAVEL SURFACE	NO	--	NO	MAINTENANCE-LEVEL PROJECT
LIGHTING - SD 1804/GREY GOOSE ROAD	NO	--	NO	PURSUE JOINT PROJECT WITH SDDOT
SHORE EROSION - WEST BEND ROAD	NO	--	NO	PURSUE JOINT PROJECT WITH COE
RANGE ROAD, REBUILD TO RURAL ARTERIAL	NO	--	NO	DEPENDING ON DEVELOPMENT
KINGSWAY ROAD, REBUILD TO RURAL ARTERIAL	NO	--	NO	DEPENDING ON DEVELOPMENT



11. Conclusions and Recommendations

Conclusions

The Hughes County Master Transportation Plan provides a comprehensive framework for guiding the maintenance, preservation, and enhancement of the County's transportation network over the next 20+ years. Beginning with an introduction of the background and challenges facing Hughes County, the Master Transportation Plan provides a comprehensive, multi-modal illustration of the existing and future transportation needs before transitioning into strategies and solutions. In many respects, the Master Transportation Plan is structured to provide strategies to help Hughes County maintain the existing network to a level the County residents have grown accustomed to and expect, yet offering the flexibility to provide network enhancements and adapt to changing conditions and needs well into the future.

In conjunction with the initial public and stakeholder involvement process, the SAT identified the following five current and forecasted needs facing the Hughes County transportation network:

- Bridge Condition
- Roadway Surfacing
- Multi-Modal Accommodations
- Growth Areas
- Drainage

To address these needs, a series of 'plans' were developed to provide a systematic approach to the planning, prioritization, and implementation of future transportation projects. These plans take the issues and needs identified at the onset of the study and provide the road map to implement recommended strategies and solutions for the next 20+ years:

- Major Roads Plan
- Bridge Plan
- Bicycle and Pedestrian Plan
- Roadway Preservation and Maintenance Plan
- Project Implementation Plan

The Roadway Design, Analysis, and Policy Guidelines chapter was developed to supplement the aforementioned plans and establish formal design and analysis guidelines for future projects and evaluation of impacts in Hughes County. These guidelines support the long-term transportation network priorities and goals of Hughes County

Public and stakeholder involvement has been an integral part of shaping the Master Transportation Plan, identifying several issues and needs throughout the County and providing recommendations for implementation. Through these discussions, the study team's initial inclinations regarding the importance of maintaining heavy load and large equipment route continuity and connectivity were validated. Providing a reliable network of priority routes to accommodate consistent vehicle width and weight safely is extremely important to the agricultural economy of Hughes County and one of the main objectives of the Major Roads Plan. The County is fortunate to have a well-spaced network of US/State highway corridors that are considered the backbone for freight and agricultural mobility within Hughes County. County highways supplement this network by providing key state route connections and cross-county corridors at regular intervals.

Maintaining a sustainable transportation network, while incorporating feasible mobility and safety improvements as opportunities arise, is one of the greatest challenges facing Hughes County. County funding has been historically flat and proving difficult to keep up with increasing material and construction costs. An evaluation of identified needs vs. forecasted funding shows a shortfall of over $21 million over the next 20 years when inflation of material and construction costs is considered.

Given the challenges in maintaining the existing system as it is today, one of the hallmarks of the Hughes County Master Transportation Plan is to provide a comprehensive strategy of maintenance, preservation, and major rehabilitation/replacement for roads and bridges in order maximize the design life of each investment. In addition, when that next major investment is needed, Master Transportation Plan incorporates several opportunities to either modify the existing network or implement a long-term investment geared towards a sustainable transportation network in line with priorities established in the Major Roads Plan. Candidate roadway segments for potential roadway surface modifications (gravel vs. bituminous), bridges for potential closure, jurisdictional transfers, and improvements to roadway typical section elements are all examples of potential modifications to the existing network.

In conclusion, the Hughes County Master Transportation Plan provides the framework by which Hughes County will be able to prioritize, select, and implement improvements to the transportation network over the next 20+ years. It also provides the flexibility to react to changing conditions and shifts in the County's transportation needs as well as opportunities to provide network enhancements and long-term investments as they arise. The Master Transportation Plan is an important step in working towards maintaining the sustainability of the County's transportation network into the future, in addition to recognizing the challenges facing the implementation of the long-range plan. Ultimately, the Master Transportation Plan provides solutions to address the existing and future issues and needs while promoting a livable community that will enhance the economic and social well-being of Hughes County residents.

Recommendations

The following provides general recommendations of the implementation of the Hughes County Master Transportation Plan, incorporating the evaluation of existing and future conditions, identification of issues and needs, recommended guidance and strategies included each specific plan, and public and stakeholder involvement throughout the study process:

1. Maintain and preserve the existing transportation system and infrastructure.
    a. Maximize the existing transportation infrastructure investment through proactive preservation and maintenance.
    b. Utilize the guidance within the Master Transportation Plan to assist in the identification, prioritization, and selection of projects, and allocation of funding.
    c. When faced with major investment decisions, evaluate potential changes to roadway surfacing, closures of bridges, jurisdictional transfers, and roadway typical section elements based on systematic and long-term need-driven evaluation criteria.

2. Prioritize roadways to guide investment decisions.
    a. Promote the highest level of County-jurisdiction mobility in a systematic and sustainable manner that compliments and provides key connections to/from the US/State highway system.
        i. Facilitate reliable, efficient, and safe intra- and inter-county travel.
        ii. Minimize or eliminate continuity barriers on priority routes.
    b. Utilize route prioritization guidance identified in the Major Roads Plan.

c. Utilize bridge prioritization guidance identified in the Bridge Plan.

3. Continue to seek and evaluate new and additional funding opportunities for road and bridge projects.
    a. Investigate feasibility of implementing additional funding opportunities
    b. Evaluate the potential for outside grants and assistance when applicable.
    c. Provide an annual summary for the public regarding what has been completed with the additional funding.

4. Provide a proactive, comprehensive approach to address current and future issues and needs throughout the County's transportation network.
    a. Facilitate a program that blends roadway preservation and maintenance of the existing infrastructure with capital improvement, reconstruction, capacity expansion, and multi-modal improvement projects based on the Master Transportation Plan.
    b. Continue the annual rural road conditions surveys.
    c. Consider the long-range series of improvement needs along a corridor to provide a systematic, planned approach to address issues and needs over the next 20+ years.
        i. In many instances, corridors have multiple, yet exclusive, identified needs. The County should plan to address these needs along the corridor in a systematic and cost-effective means.
    d. Begin planning for large, long-term projects well in advance to assess avenues of funding and coordination.
    e. Consider improvements to all modes of travel throughout the County during major preservation and maintenance activities as well as long-term capital improvement projects.

5. Maintain a Master Transportation Plan that is compatible with other planning documents and adaptable to address unforeseen needs and the evolving transportation network.
    a. The Hughes County Master Transportation Plan is intended to be a living document, updated by Hughes County as needed in the future.
    b. Use the Master Transportation Plan to collaborate with additional multi-modal planning efforts within Hughes County, local municipalities, SDDOT-jurisdiction roadway planning, and adjacent counties to promote route connectivity and continuity of a regional transportation network.
    c. Incorporate guidance from the Master Transportation Plan into Hughes County permits, ordinances, and future studies.

6. Incorporate roadway design and analysis guidance from the Master Transportation Plan into Hughes County permits, ordinances, regulations, and future studies.

Appendix A – Existing Conditions Memorandum

Appendix B – Public Involvement Summaries

Appendix C – Design Standard and Policy Recommendations

Appendix D – Bridge Rating Table