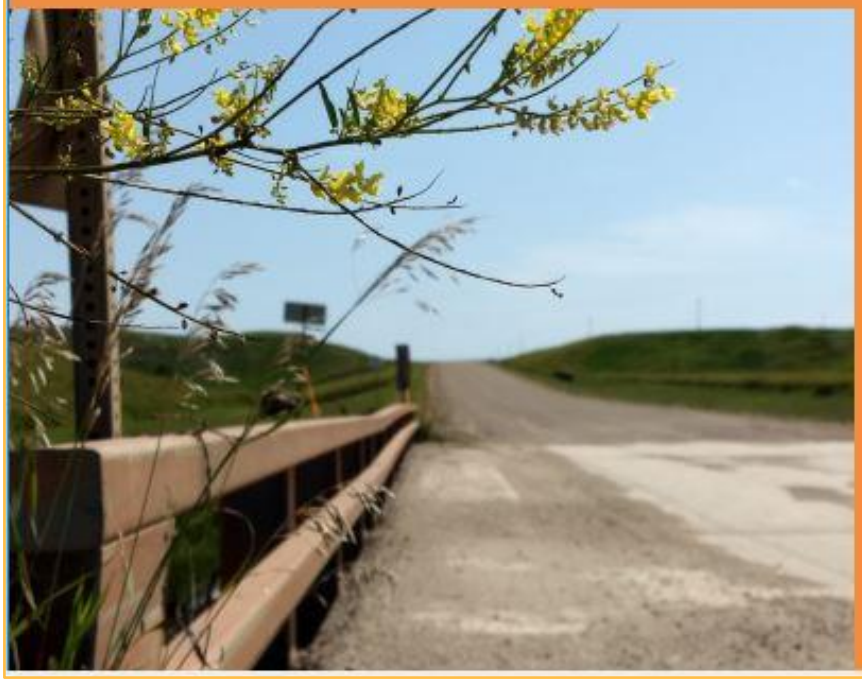
2021 Cheyenne River Sioux Tribe
Long Range Transportation Plan



October 2021

Minnicoujou Itazipco

Siha Sapa 1868 Oohenumpa

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ENGINEERING, REIMAGINED

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APPENDICES

DEFINITION OF ACRONYMS

AADT – Average Annual Daily Traffic
ADA – Americans with Disabilities Act
AIP – Airport Improvement Program
BIA – Bureau of Indian Affairs
BIG – Bridge Improvement Grant
BUILD - Better Utilizing Investments to Leverage Development
CFR - Code of Federal Regulations
CRST – Cheyenne River Sioux Tribe
DEMD – Division of Energy and Mineral Development
ERFO - Emergency Relief for Federally-owner Roads
FAA – Federal Aviation Administration
FAST Act – Fixing America's Surface Transportation Act
FEMA – Federal Emergency Management Agency
FHWA – Federal Highway Administration
FMLA – Federal Land Management Agency
GIS – Geographic Information System
IHS – Indian Health Services
IRR – Indian Reservation Roads
LED – Light-Emitting Diode
LRTP – Long Range Transportation Plan
MAP-21 – Moving Ahead for Progress in the 21st Century Act
MnDOT – Minnesota Department of Transportation
MUTCD – Manual on Uniform Traffic Control Devices
NPIAS – National Plan of Integrated Airport Systems
NTTFI – National Tribal Transportation Facility Inventory
PASER – Pavement Surface Evaluation and Rating
PM – Particulate Matter

PMP – Pavement Management Program
RCPT – River Cities Public Transit
RIFDS – Road Inventory Field Data System
RSA – Road Safety Audit
SDDENR – South Dakota Department of Environment and Natural Resources
SDDOT – South Dakota Department of Transportation
SDLTAP – South Dakota Local Transportation Assistance Program
SDDPS – South Dakota Department of Public Safety
SDSASP – South Dakota State Aviation System Plan
TA – Transportation Alternatives
TECA – Tribal Equitable Compensation Act
TraCS – Traffic and Criminal Software
TTIP – Tribal Transportation Improvement Program
TTP – Tribal Transportation Program
TTSP - Tribal Transportation Safety Plan
USDOT – United States Department of Transportation

CHAPTER 1 - INTRODUCTION

The Cheyenne River Indian Reservation is the fourth largest Native American Indian Reservation in the United States with a land mass of approximately 4,300 square miles. It is located in Dewey and Ziebach counties in South Dakota. There are also small parcels of trust land located off the Reservation in Stanley, Haakon, and Meade counties. According to the Bureau of Indian Affairs (BIA), there are close to 16,000 enrolled members of the Cheyenne River Sioux Tribe with about 70 percent, or around 11, 200 members living on the Reservation. This estimate is roughly 40% higher than the 2010 Census value which lists total Reservation population at around 8,100.

The Cheyenne River Sioux Tribe needs a transportation system that safely and efficiently moves people and goods and provides quality access to Tribal housing, services, and employment. The Long Range Transportation Plan (LRTP) is a master transportation plan, covering all modes of travel and presenting needs and alternatives from maintenance to new facility construction.

The LRTP provides guidance for new policies and project decisions related to funding. Thus, it provides a foundation for development of the Tribal Transportation Improvement Program (TTIP). The TTIP is a fiscally constrained 5-year plan that outlines use of federal transportation dollars on Tribal transportation projects. The LRTP is more comprehensive in nature and it provides a system-level analysis rather than a project detailed analysis. Therefore, where additional analysis or studies are needed, the LRTP provides direction as to the types of analysis or studies that should be undertaken in the future.

This LRTP fulfills the requirements outlined in the November 7, 2016 Federal Register, 25 CFR Part 70, Tribal Transportation Program (TTP); Final Rule. In compliance with those directives, this LRTP is a 20+ year strategy and capital improvements program developed to guide the effective investment of TTP funds. It also provides a strong basis to be used for grant funding applications submitted for multimodal transportation facilities. The short range element applies to the years 2020 through 2024. The long range element applies to the years 2025 through 2045. The previous CRST LRTP was completed in 2006. This LRTP supersedes the 2006 LRTP. The Federal Register suggests that this plan be updated every 5 years.

PLAN PURPOSE

Per the CFR, the purpose of a Tribal LRTP is to clearly demonstrate a Tribe's transportation needs and to fulfill Tribal transportation goals by developing strategies to meet those goals. These strategies should address future land use, economic development, traffic demand, public safety, and health and social needs.

CRST officials need a strategic approach to respond to existing and anticipated future transportation issues. Therefore, the Tribe has undertaken this effort to develop a master plan for transportation infrastructure. The purposes of this plan are:

- To collect and examine information on current and future transportation improvement needs.
- To consider the needs of all modes of travel (vehicular, pedestrian, bicycle, and transit) and develop strategies and recommend projects to accommodate them. This Plan examines the existing system of roads, sidewalks, bridges, and transit facilities and considers opportunities for future improvements.
- To review the current transportation system maintenance strategy and consider opportunities for improvement.
- To provide a basis for future transportation improvement programming that is sustainable. The ability of the Tribe to sustain the transportation system is strongly tied to project costs and available funding. This Plan needed to consider existing and potential funding sources, the costs of maintenance, rehabilitation and new construction, and provide guidance on effective use of limited funding.

RECENT AND CONCURRENT STUDIES

Over the past number of years, most of the funding resources available to the CRST DOT have been used to conduct road projects. An exception to this is the CRST Tribal Transportation Safety Plan, completed in 2015. No other recent or concurrent transportation planning studies were identified.

CRST TRANSPORTATION GOALS

Based on the initial public meeting held on March 18, 2019, as well as other conversations held with Tribal officials, the following transportation-oriented goals of the CRST were identified:

1. Upgrade surfacing on the gravel road system. With the majority of roads on the Reservation constructed of gravel, it takes an exhaustive maintenance effort to keep them drivable. The Tribe wishes to upgrade gravel road surfaces using base stabilization and the addition of a blotter coat and double chip seal, resulting in a harder surface and less required maintenance over time. Improvement projects for many of the BIA gravel roads have been included in the short and long range elements of this Plan.
2. Improve the road surfaces and safety features of all major routes leading into Eagle Butte; many health care and other services are accessed in this community.
3. Update the RIFDS inventory to more accurately reflect the roads on the Reservation that are owned and/or maintained by the Tribe and BIA.

4. Reduce the disparity of funding that favors Tribes with higher populations vs. Tribes with a large land base. Accomplishments so far in this endeavor are collaborative meetings with other Tribes and visits to Congress to petition for funding changes.
5. Incorporate more snow fences along roadway corridors to reduce maintenance and save time and money.
6. Certify more people to operate heavy equipment, improving responsiveness to major snow events and system failures.
7. Improve effectiveness in grant applications.
8. To improve the conditions of roads and bridges within the Reservation.
9. To provide better connectivity and traveling safety for non-motorized modes of travel.
10. To strategically align the highest Tribal transportation needs with available funding.
11. To effectively maintain their transportation system at a higher level over time.

Other transportation goals were identified as the planning process proceeded:

1. Assess damages after flooding in Spring 2019 and apply for FEMA (Federal Emergency Management Agency) and EFRO (Emergency Relief for Federally owned Roads) funding for repairs.
2. Map Reservation road ownership via GIS.

CHAPTER 2 - STUDY AREA

The Cheyenne River Indian Reservation, located in north central South Dakota, is bordered on the north by the Standing Rock Indian Reservation, on the east by the Missouri River, on the south by the Cheyenne River, and on the west by Meade and Perkins counties. The Reservation covers almost 4,270 square miles, making it the fourth largest Reservation by land area in the United States. The study area is shown in Figure 2-1.

Members of the Cheyenne River Sioux Tribe are comprised of four of the traditional seven bands of the Lakota: Mnicoujou, Oohenunpa, Itazipco, and Siha Sapa. Governance is provided by a Tribal Council that consists of a chairperson, vice-chairperson, secretary, and treasurer, who are elected for four-year terms, and 15 council members elected from 13 districts who are elected for two-year terms. Voting districts on the Reservation are shown in Figure 2-2.

The main economic driver on the Reservation is cattle ranching, which accounts for three of every four private sector dollars according to BIA labor statistics. Farming is a major contributor to the Tribe's annual income, with about 28,000 acres producing crops that include corn, barley, and native hay. Tribally owned businesses also contribute to the economy and include the CRST Telephone Authority, CRST Cable TV, CRST Gas Company, and Lakota Thrifty Mart. The Tribe also owns cattle and bison herds. Hunting, fishing, and recreational areas located along the Missouri and Cheyenne Rivers generate tourism dollars into the local economies.

North Eagle Butte, Eagle Butte, Dupree and Timber Lake are the largest communities on the Reservation. Tribal headquarters and the BIA Cheyenne River Agency are both located in Eagle Butte. Timber Lake hosts the Dewey county seat, while the county seat for Ziebach county is in Dupree.

Other communities on the Reservation include Bear Creek, Blackfoot, Bridger, Cherry Creek, Green Grass, Iron Lightning, Isabel, La Plant, Promise, Red Scaffold, Swiftbird, Tankini, Thunder Butte, and Whitehorse. Aerial images of these communities are shown in Figures 2-3 through 2-20.

There are schools in Eagle Butte, Timber Lake, Dupree, and Takini that provide education for children in grades K-12. The Head Start program has facilities in Cherry Creek, Eagle Butte, and Dupree, and the Oglala Lakota College has a satellite branch in Eagle Butte.

The CRST Department of Transportation is administered by the Roads Committee, which is a subdivision of the Tribal Council. It is responsible for maintaining almost 350 miles of BIA and Tribal roadways. Of these, approximately 60 miles are paved, with the remainder consisting of earthen and gravel roadways. There are about 920 miles in the National Tribal Transportation Facility Inventory (NTTFI) that fall under the jurisdiction of the State and County. Most of these are County-owned gravel roads (725 miles) roads and a little over 100 miles are paved.

The study area includes the following federal and state highways. The current state-specified functional classifications are noted for each highway.

- US Highway 212 – Principal Arterial
- SD Highway 34 – Principal Arterial
- SD Highway 20 – Minor Arterial
- SD Highway 63 – Minor Arterial
- SD Highway 65 – Major Collector

Figure 2-1 – Cheyenne River Indian Reservation Study Area

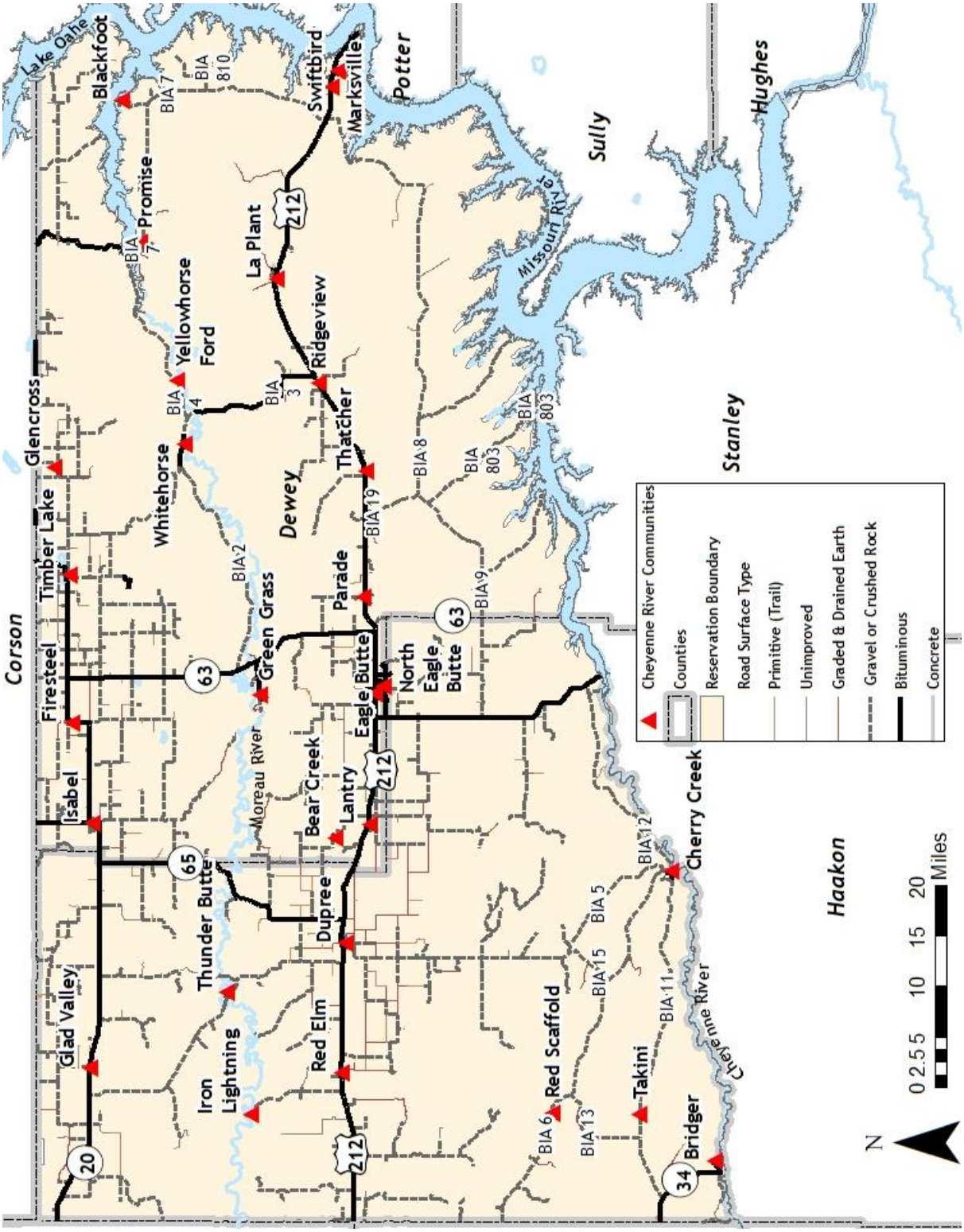


Figure 2-2 - Cheyenne Sioux Tribe Voting Districts

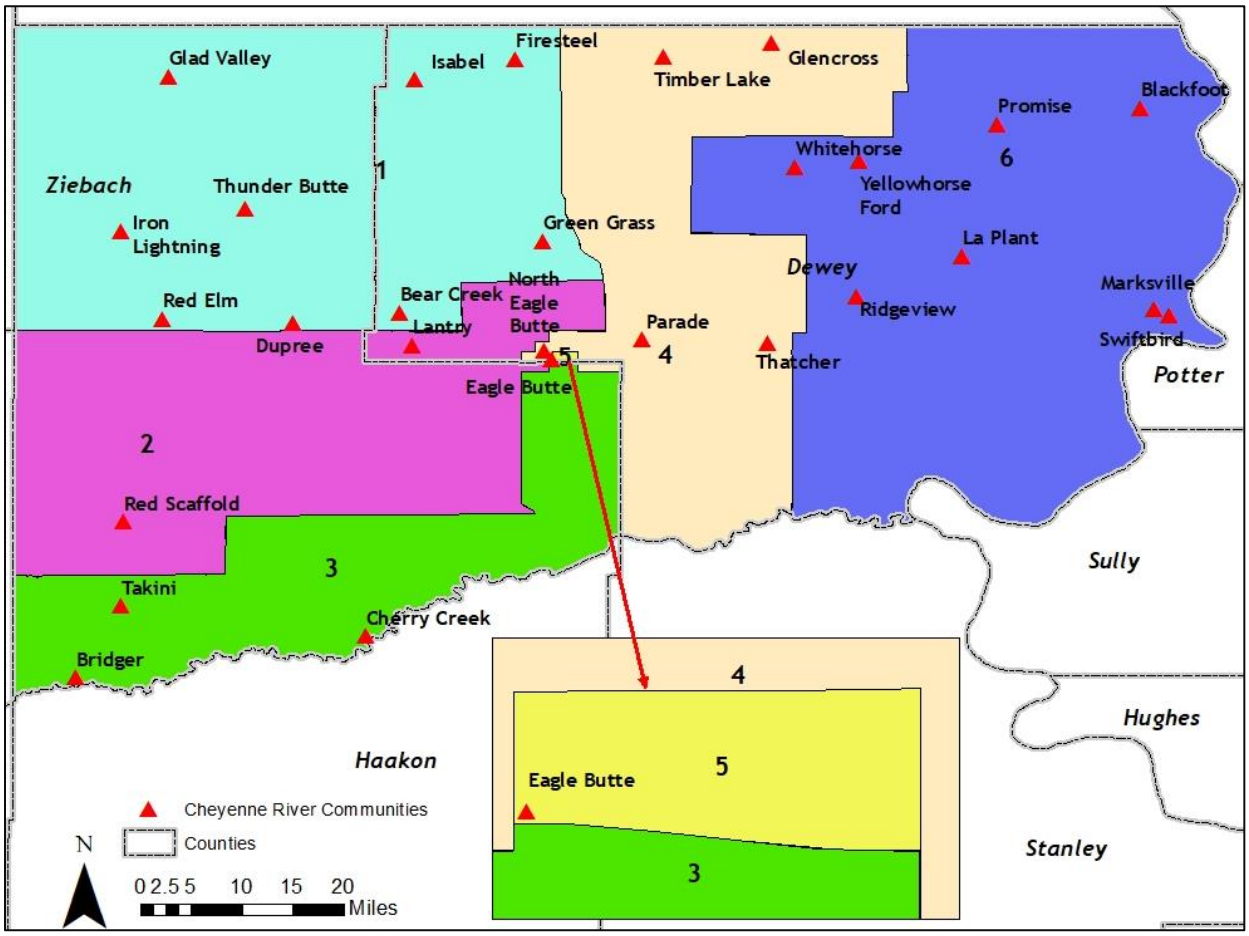


Figure 2-3 - Bear Creek

Figure 2-4 - Blackfoot

Figure 2-5 - Bridger

Figure 2-6 - Cherry Creek

Figure 2-7 - Dupree

Figure 2-8 - Eagle Butte/North Eagle Butte

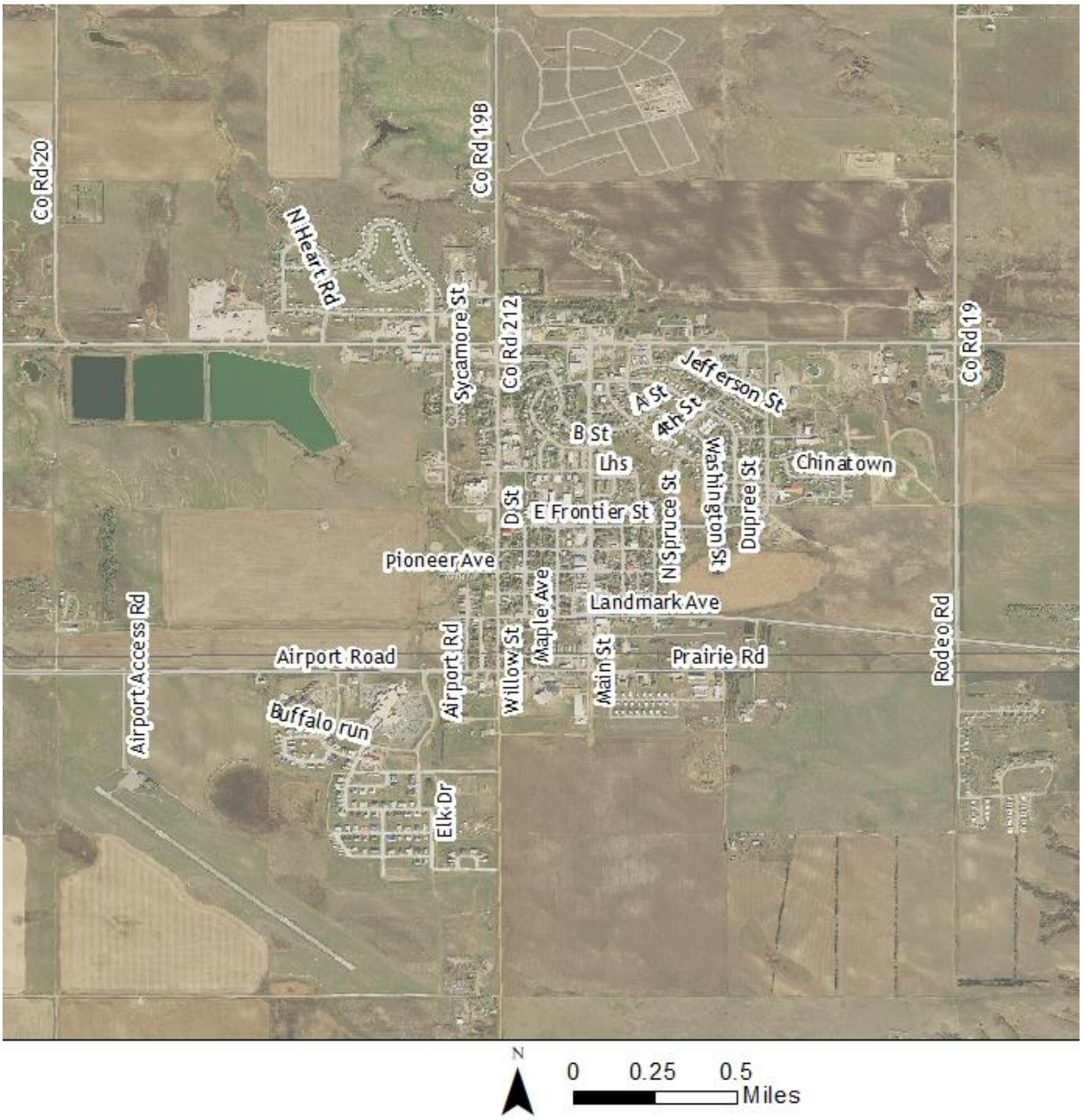


Figure 2-9 - Green Grass

Figure 2-10 - Iron Lightning

Figure 2-11 - Isabel

Figure 2-12 - La Plant

Figure 2-13 - Promise

Figure 2-14 - Red Scaffold

Figure 2-15 - Ridgeview

Figure 2-16 - Swiftbird

Figure 2-17 - Tankini

Figure 2-18 - Thunder Butte

Figure 2-19 - Timber Lake

Figure 2-20 - Whitehorse

SCENIC BYWAYS

The Native American National Scenic Byway is a 350-mile scenic byway that starts in Chamberlain, South Dakota and ends at the northern border of the Standing Rock Indian Reservation near Cannon Ball, North Dakota. Along the byway are memorial markers, monuments, and sacred sites meant to commemorate the culture and history of the Lakota people. It passes through four Lakota Reservations including the Cheyenne River Indian Reservation.

The route enters the Reservation via SD 63 at the Cheyenne River and then goes north to Eagle Butte. Here, the byway is picked up by US Highway 212 and runs east to the junction with ND/SD 1806. The byway then goes north and exits the Reservation at the border located approximately ten miles north of the town of Promise. Figure 2-21 shows the South Dakota and Cheyenne River Indian Reservation sections of the byway.

Figure 2-21 - Native American National Scenic Byway

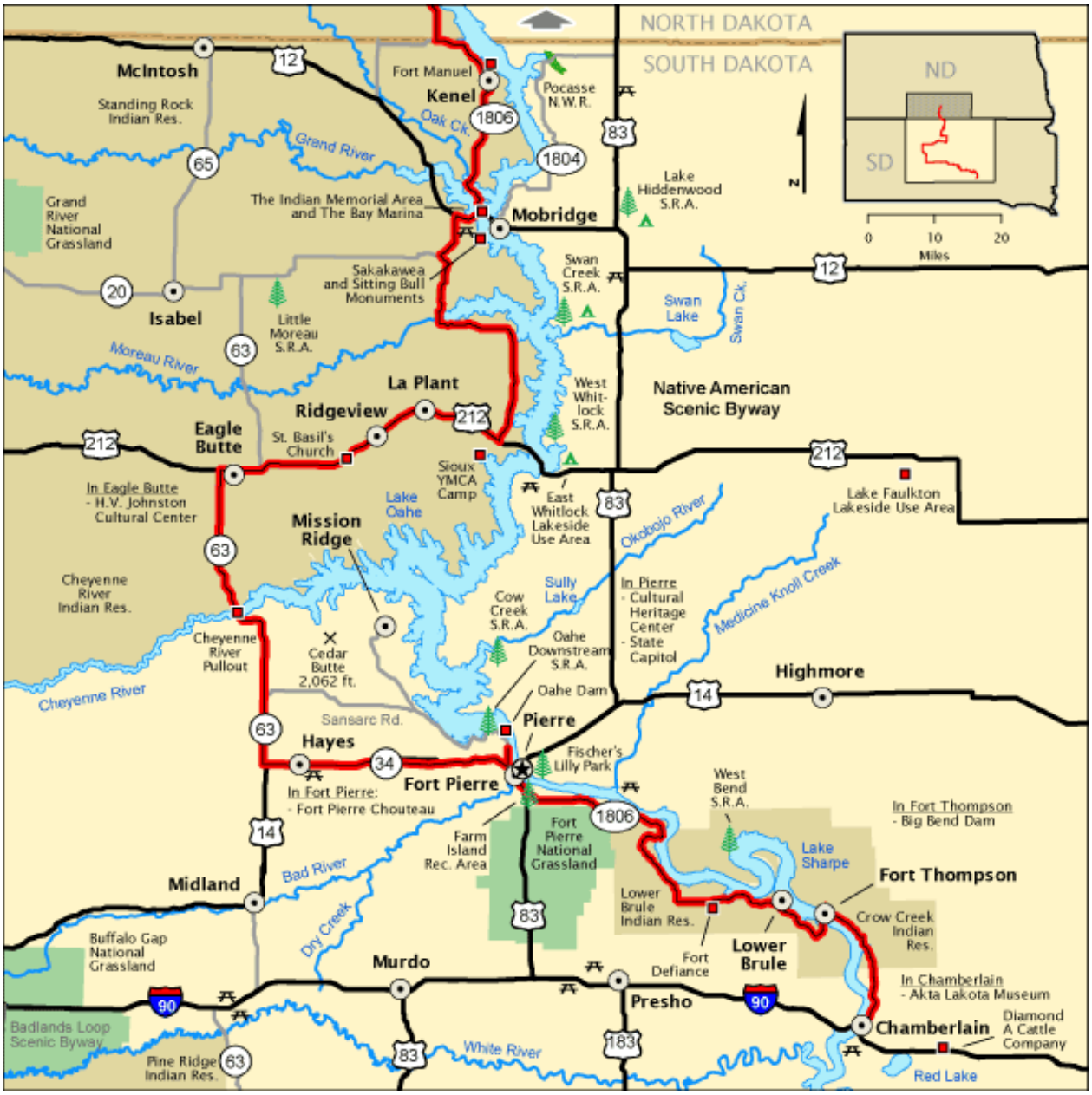


Image Source: FHWA – America's Byways

CHAPTER 3 - INVENTORY AND DATA ANALYSIS

In order to determine the extent of transportation deficiencies and improvement opportunities, a transportation system evaluation was performed within the study area. Available aerial photography and data inventories were analyzed and mapped using Geographic Information System (GIS) technology to complete the evaluation. Perhaps one of the greatest benefits of the plan development process was the preparation of mapped resources which can aid Tribal planners, technicians, and officials to better understand the strengths and weaknesses of their transportation system.

Observations were made to assess the existing transportation network and traffic conditions were examined to identify potential issues and opportunities. This step determined the transportation network needs and potential improvement strategies for implementation.

ROAD INVENTORY AND OWNERSHIP

This section of the report discusses the existing road inventory, which is administered by the BIA, and provides recommendations for roadway, bridge, and shared use path additions. Strip maps and the full roadway inventory are available for review upon request.

ROADWAY OWNERSHIP

Most of the roads on the Reservation are Dewey or Ziebach county roads. Roads on the Cheyenne River Indian Reservation are also owned by the CRST, SDDOT, FHWA, BIA, and municipalities.

INVENTORY AND FUNCTIONAL CLASSIFICATION

Data for this section was obtained from the National Tribal Transportation Facility Inventory (NTTFI), previously called the Road Inventory Field Data System (RIFDS). Functional classification establishes a hierarchy for roads. It provides a systematic approach to designing and prioritizing roads that have different purposes. Arterials, for example, are designed to serve higher volumes of traffic at high speeds and over greater distances, while collectors are designed to facilitate some land access and have lower design speeds and traffic volumes.

From a residential standpoint, most people prefer to live along quiet local roads with frequent land access points (driveways). At the same time, residents typically desire a relatively direct driving path at higher speeds to reach their destination.

The highest volume roads and roads most capable of handling truck traffic are typically carried by arterials. Traffic volume alone does not define arterials. Arterials generally carry traffic travelling longer distances. Arterials also typically have higher standards for width, safety, travel speeds, and surface conditions. It is desirable that residents can travel north/south and

east/west across the Reservation on arterials or major collectors and that communities are connected to other towns within the Reservation and beyond with arterial roads.

The state highways and some key BIA routes serve regional trips entering and exiting the Reservation. Other highways are planned to serve shorter distance trips based on classification. Classifications by surface types from the NTTFI are shown in Figure 3-1.

FIGURE 3-1 – Functional Classifications and Surface Types

Road Miles by Classification and Surface Type									New Roads by Future Surface Type				Total Miles
	Proposed	Earth	Gravel	Asphalt < 2 inch	Asphalt > 2 inch	Concrete	Trail	None	Earth	Gravel	Paved	None	
Class		(1)	(3)	(4)	(5)	(6)	(9)	(null)	(E)	(G)	(P)	(null)	
1 - Major Arterial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 - Rural Minor	0.0	0.0	15.3	0.0	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.2
3 - City Local	0.0	1.4	1.5	1.8	13.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	19.8
4 - Rural Major	0.0	79.7	915.3	29.6	9.5	0.0	0.0	0.0	0.0	14.7	0.0	0.0	1048.8
5 - Rural Local	0.7	53.4	28.8	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.8
6 - City Minor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - City Collector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 - Trails	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 - Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 - Airstrips	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
null - No Class	0.0	0.0	0.0	8.0	87.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	95.7
Total:	0.7	134.5	960.9	39.5	124.8	1.2	0.0	0.0	0.0	14.7	0.0	0.0	1276.3

Roadway ownership by functional classification from the NTTFI is shown in Figure 3-2.

FIGURE 3-2 – Roadway Ownership and Functional Classification

Road Miles by Ownership and Classification											
	Major Arterial	Rural Minor Arterial	City Local	Rural Major Collector	Rural Local	City Minor Arterial	City Collector	Trail	Other Trans Facility	Airstrip	Total
Owner	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
1 - BIA	0.0	28.2	19.8	259.0	0.0	0.0	0.0	0.0	0.0	0.0	307.0
2 - Tribe	0.0	0.0	0.0	1.2	51.1	0.0	0.0	0.0	0.0	0.0	52.3
3 - State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	95.7
4 - Urban	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - County	0.0	0.0	0.0	788.6	32.7	0.0	0.0	0.0	0.0	0.0	821.3
6 - Other BIA Offices	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - Other Federal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 - Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total:	0.0	28.2	19.8	1,048.8	83.8	0.0	0.0	0.0	0.0	0.0	1,276.3

Roadway ownership by surface types are shown in Figure 3-3.

FIGURE 3-3 – Roadway Ownership and Surface Types

Road Miles by Ownership and Surface Type									Future Surface Type				
Owner	Proposed	Earth (1)	Gravel (3)	< 2 inch (4)	> 2 inch (5)	Concrete (6)	Trail (9)	None (null)	Earth (E)	Gravel (G)	Paved (P)	None (null)	Total
1 - BIA	0.0	1.4	232.9	21.7	35.1	1.2	0.0	0.0	0.0	14.7	0.0	0.0	307.0
2 - Tribe	0.7	48.0	2.7	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.3
3 - State	0.0	0.0	0.0	8.0	87.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	95.7
4 - Urban	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 - County	0.0	85.1	725.3	9.7	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	821.3
6 - Other BIA Offices	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 - Other Federal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 - Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.7	134.5	960.9	39.5	124.8	1.2	0.0	0.0	0.0	14.7	0.0	0.0	1276.3

ROAD INVENTORY ADDITIONS

When existing transportation facilities are changed, or new ones are added, it is important to update the NTTFI to reflect those changes. The following routes were identified during the LRTP process as needed additions to the inventory:

- Ziebach County Road 55, Eagle Butte
- Ziebach County Road 224 ½ Avenue, Dupree
- Old Agency Tribal Park Roads (Recreational park operated by CRST Game, Fish, and Parks Department), Lake Oahe, Dewey County

All existing routes on the Reservation recorded in the 2018 NTTFI inventory were mapped using GIS as illustrated in Figure 3-4. The roadways with yellow underlighting are routes that have been identified during the LRTP process as needing to be added to the NTTFI, and are also listed in Figure 3-5.

Figures 3-6 through 3-21 provide expanded views of community streets found in the NTTFI.

Figure 3-4 – 2018 Cheyenne River Sioux Tribe NTTFI Inventory

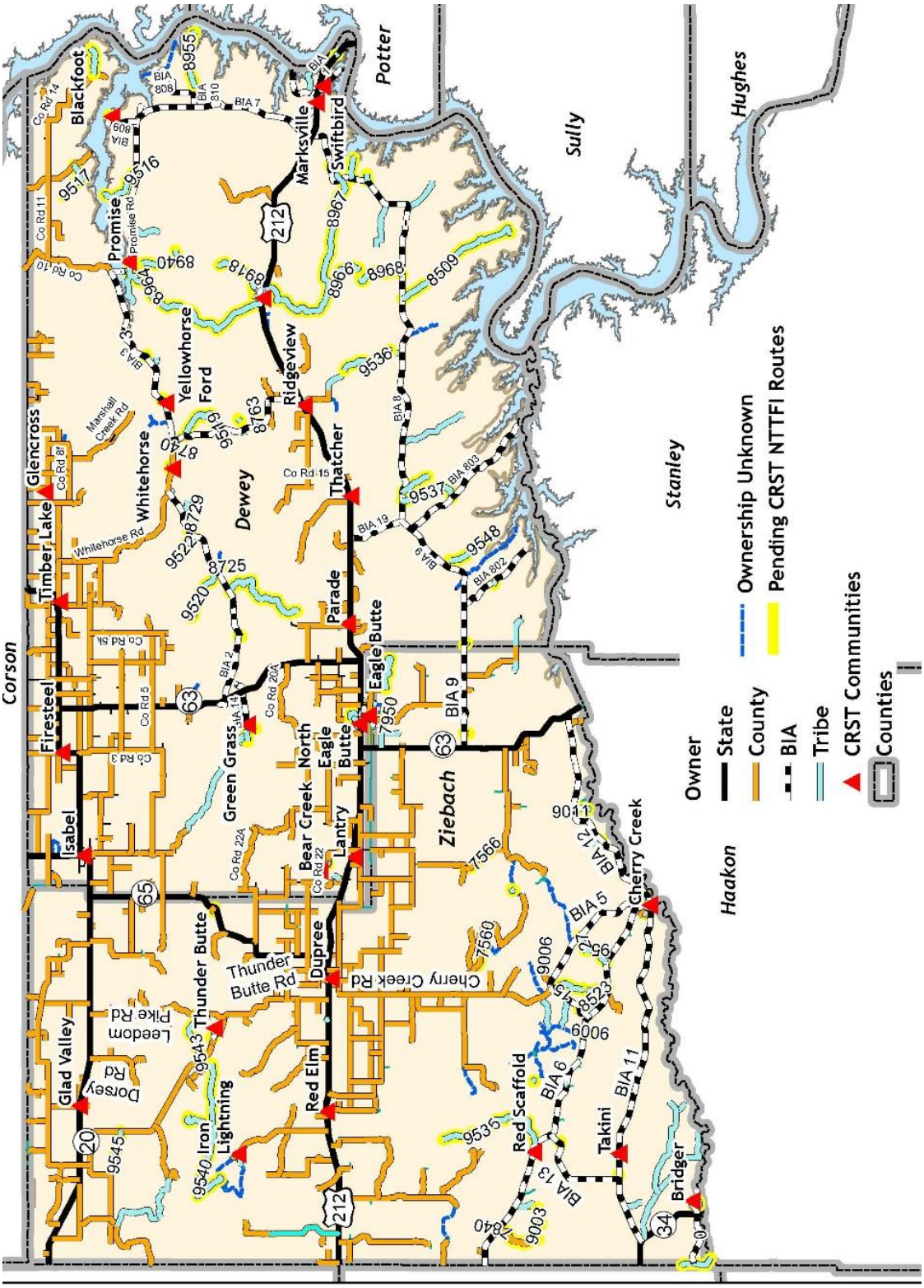


Figure 3-5 – Routes for Addition in NTTFI

Route Number	Section	Ownership	Route Number	Section	Ownership	Route Number	Section	Ownership
Intake Road	10-20	Tribe	8966	10	Tribe	9518	10	Tribe
7502	10	Tribe	8967	10	Tribe	9519	10	Tribe
7535	10	Tribe	8968	10	Tribe	9520	10	Tribe
7554	10	County	8969	10	Tribe	9522	10	Tribe
7561	10	County	9000	10-30	Tribe	9523	10	Tribe
7566	10-20	County	9001	10	Tribe	9524	10	Tribe
7801	10	County	9002	10	Tribe	9525	10	Tribe
7832	10	Tribe	9003	10	Tribe	9526	10	Tribe
7840	10	Tribe	9004	10	Tribe	9527	10	Tribe
7876	10	Tribe	9005	10	Tribe	9528	10	Tribe
7914	10	County	9006	10	Tribe	9529	10	Tribe
7950	10	Tribe	9007	10	Tribe	9531	10	Tribe
8049	10	County	9008	10	Tribe	9532	10	Tribe
8509	10-20	Tribe	9009	10	Tribe	9533	10	Tribe
8719	10	Tribe	9010	10	Tribe	9534	10	Tribe
8725	10	Tribe	9011	10	Tribe	9535	10	Tribe
8729	10	Tribe	9013	10	Tribe	9536	10	Tribe
8733	10	Tribe	9014	10	Tribe	9537	10	Tribe
8740	10	Tribe	9015	10	Tribe	9538	10	Tribe
8762	10	Tribe	9016	10	Tribe	9539	10	Tribe
8763	10	Tribe	9017	10	Tribe	9540	10	Tribe
8795	10	Tribe	9018	10	Tribe	9541	10	Tribe
8804b	10	Tribe	9019	10	Tribe	9542	10	Tribe
8808	10	Tribe	9125	10	Tribe	9543	10	Tribe
880A	10	Tribe	9500	10-20	Tribe	9545	10	Tribe
8813	10	Tribe	9503	10	Tribe	9547	10	Tribe
8815	10	Tribe	9504	10	Tribe	9548	10	Tribe
8910	10	Tribe	9505	10	Tribe	9549	10	Tribe
8911	10-20	Tribe	9506	10	Tribe	9550	10	Tribe
8915	10	Tribe	9507	10	Tribe	9551	10	Tribe
8918	10-20	Tribe	9509	10	Tribe	9552	10	Tribe
8939	10	Tribe	9510	10	Tribe	9553	10	Tribe
8940	10-100	Tribe	9513	10	Tribe	9554	10	Tribe
8948	10	Tribe	9514	10	Tribe	9560	10	Tribe
8955	10	Tribe	9516	10	Tribe	9565	10	Tribe
8962	10	Tribe	9517	10	Tribe	9570	10	Tribe
8964	10	Tribe						

Figure 3-6 - Bear Creek

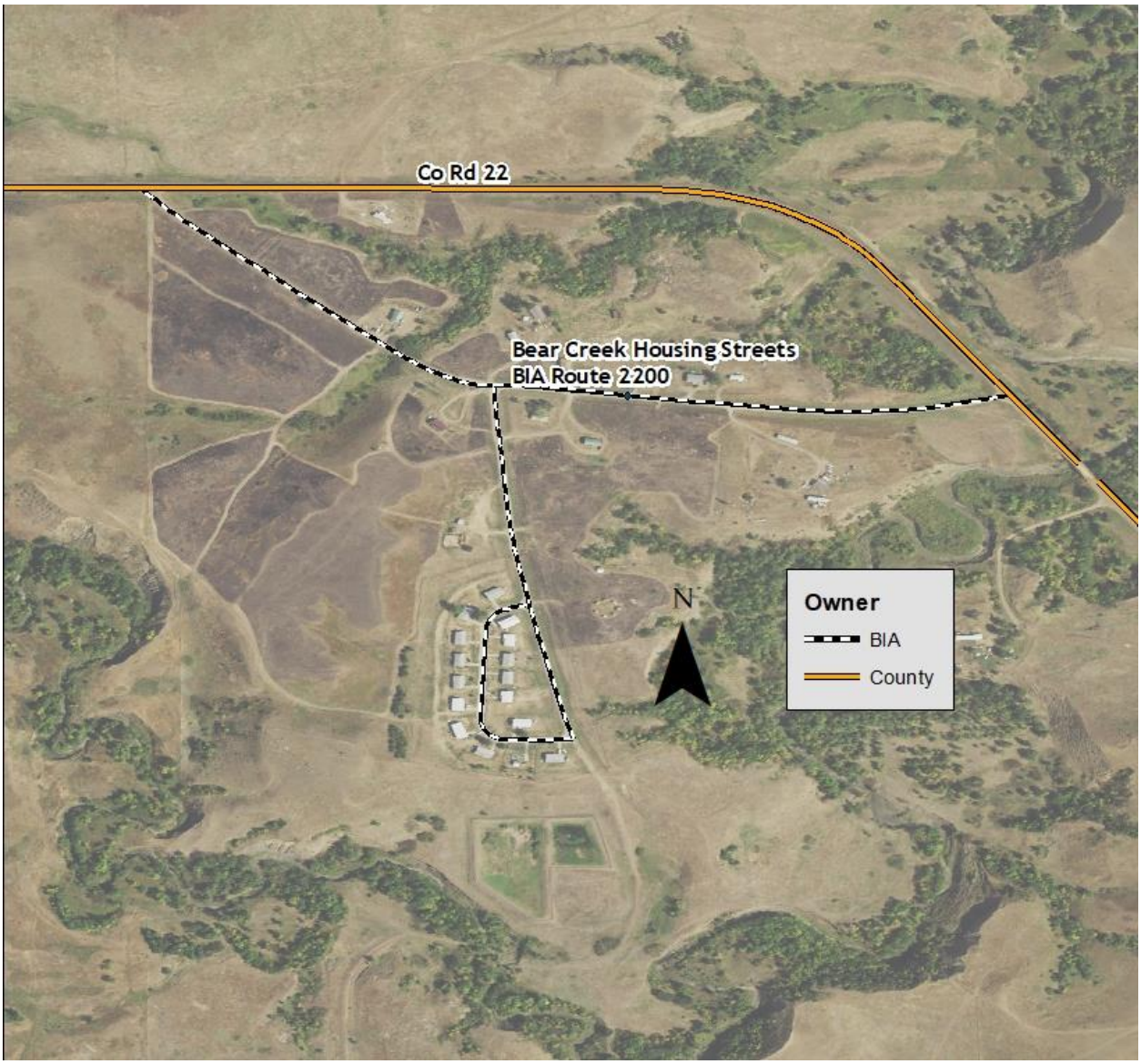


Figure 3-7 - Blackfoot

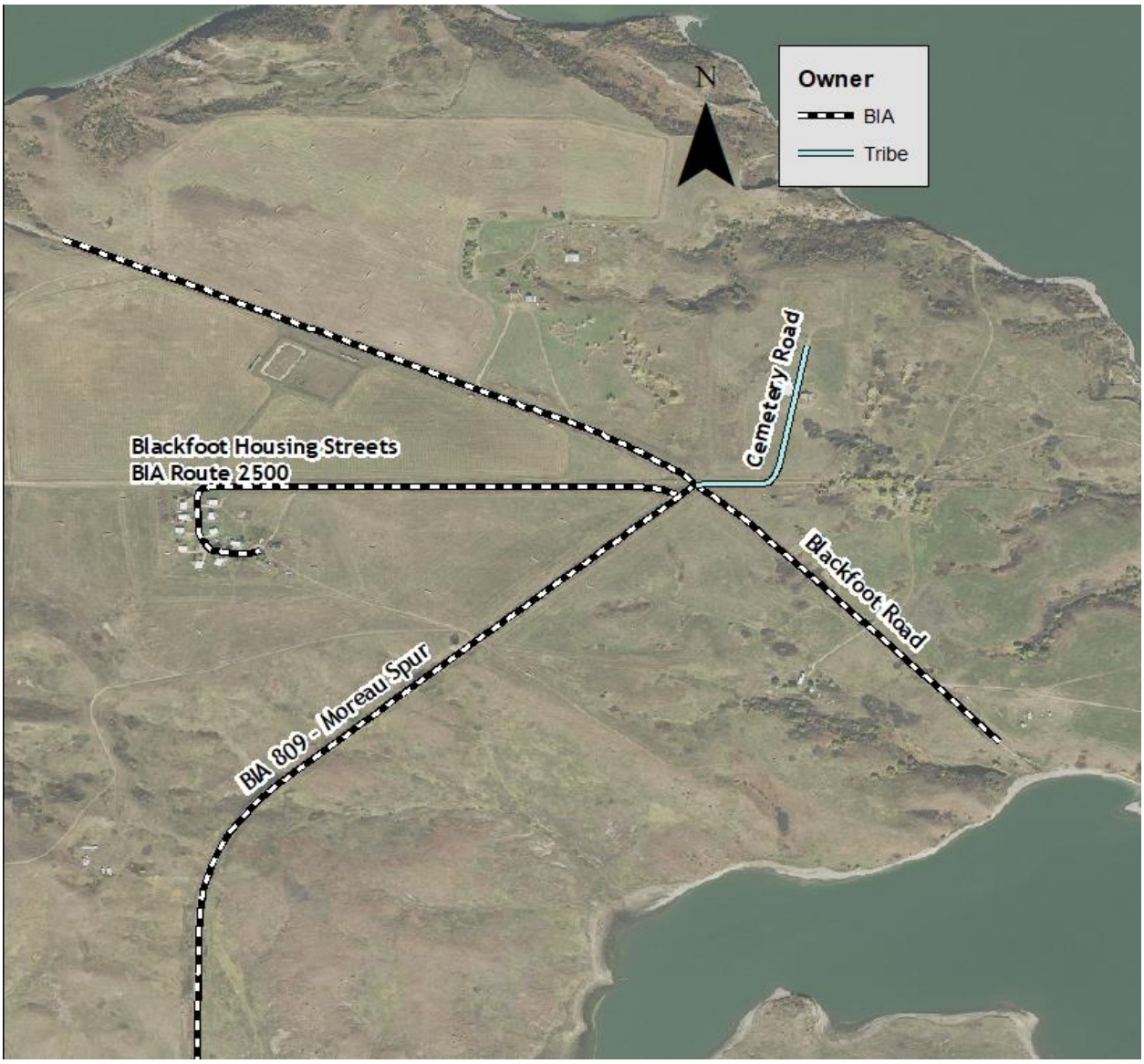


Figure 3-8 - Bridger

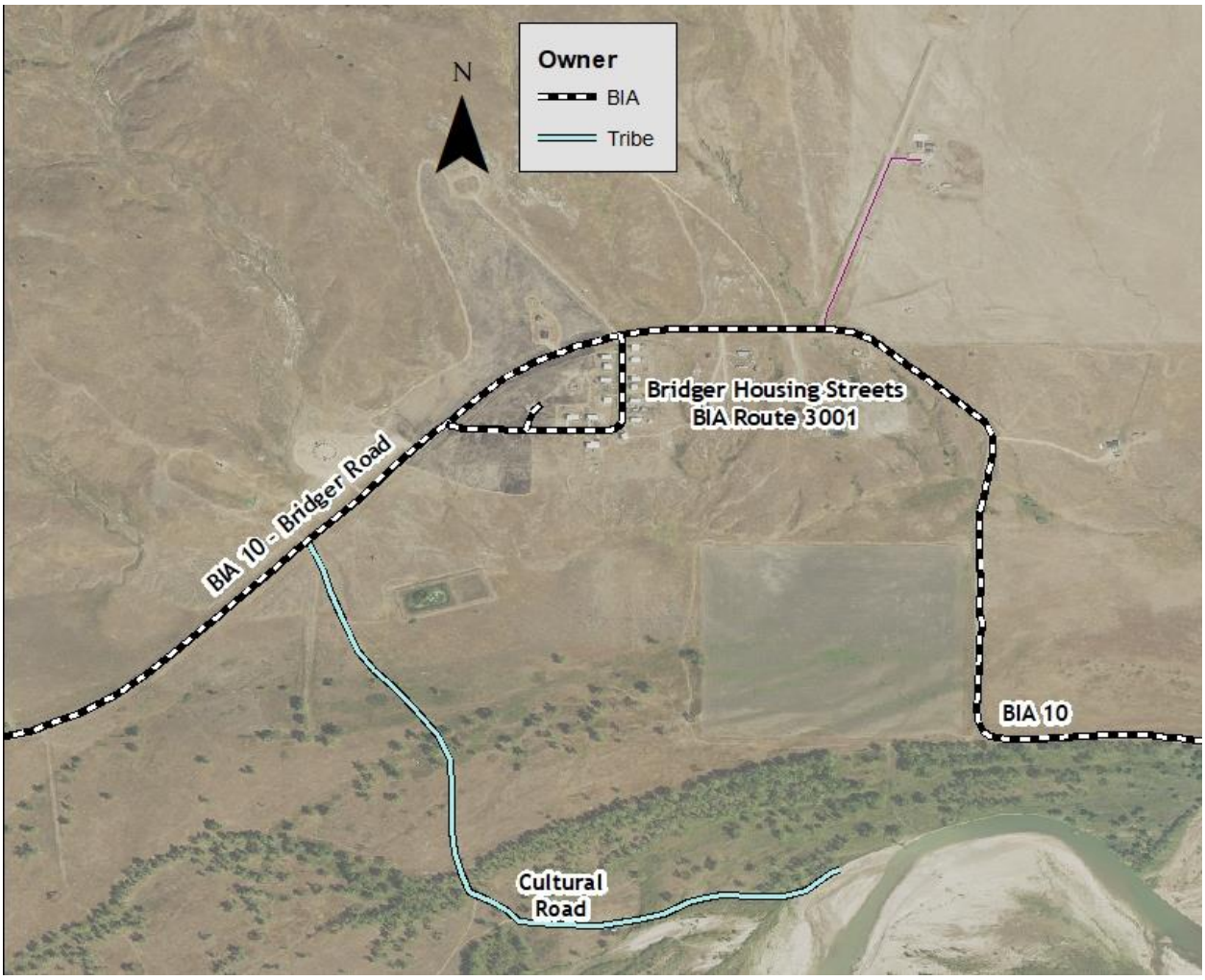


Figure 3-9 - Cherry Creek

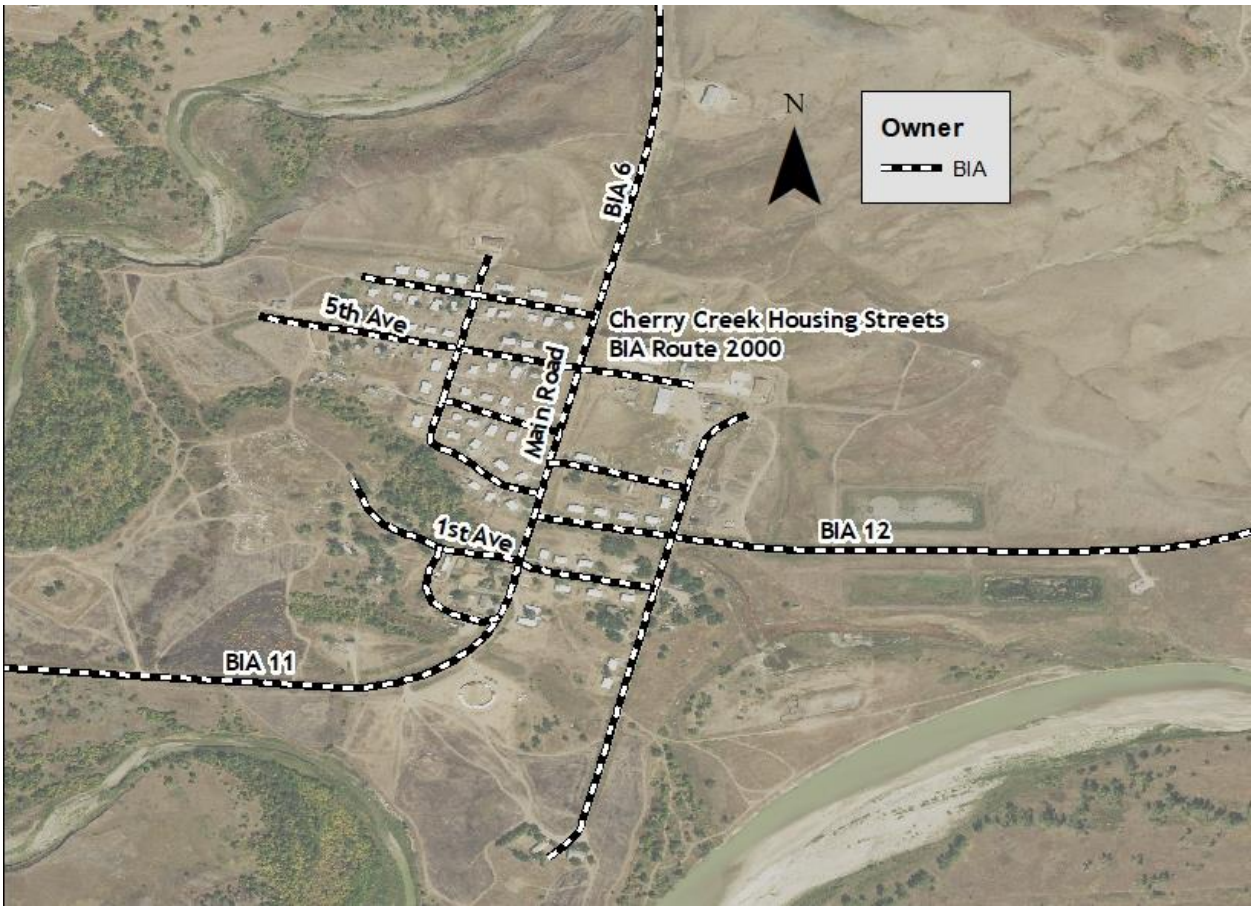


Figure 3-10 - Dupree

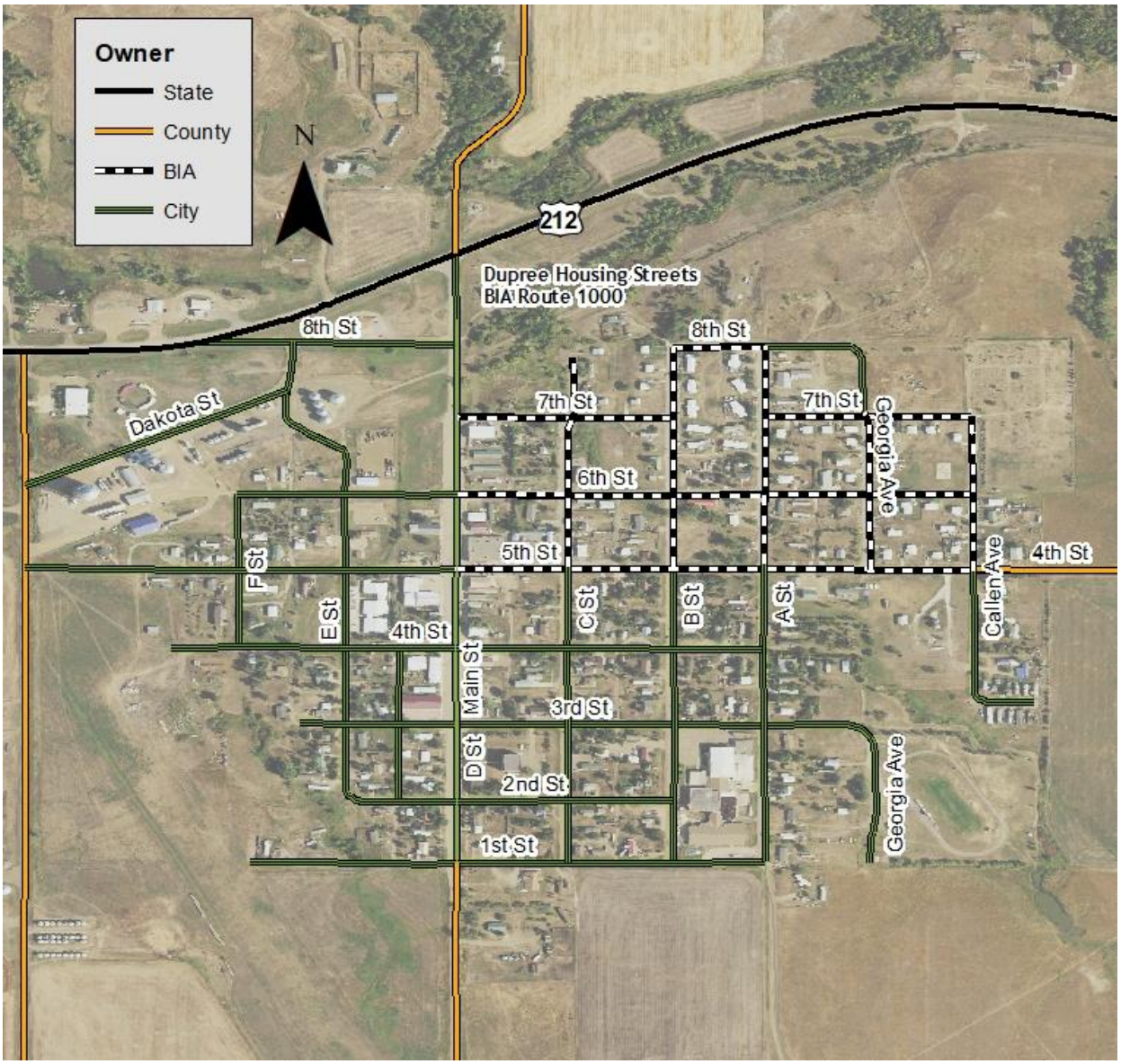


Figure 3-11 - Eagle Butte

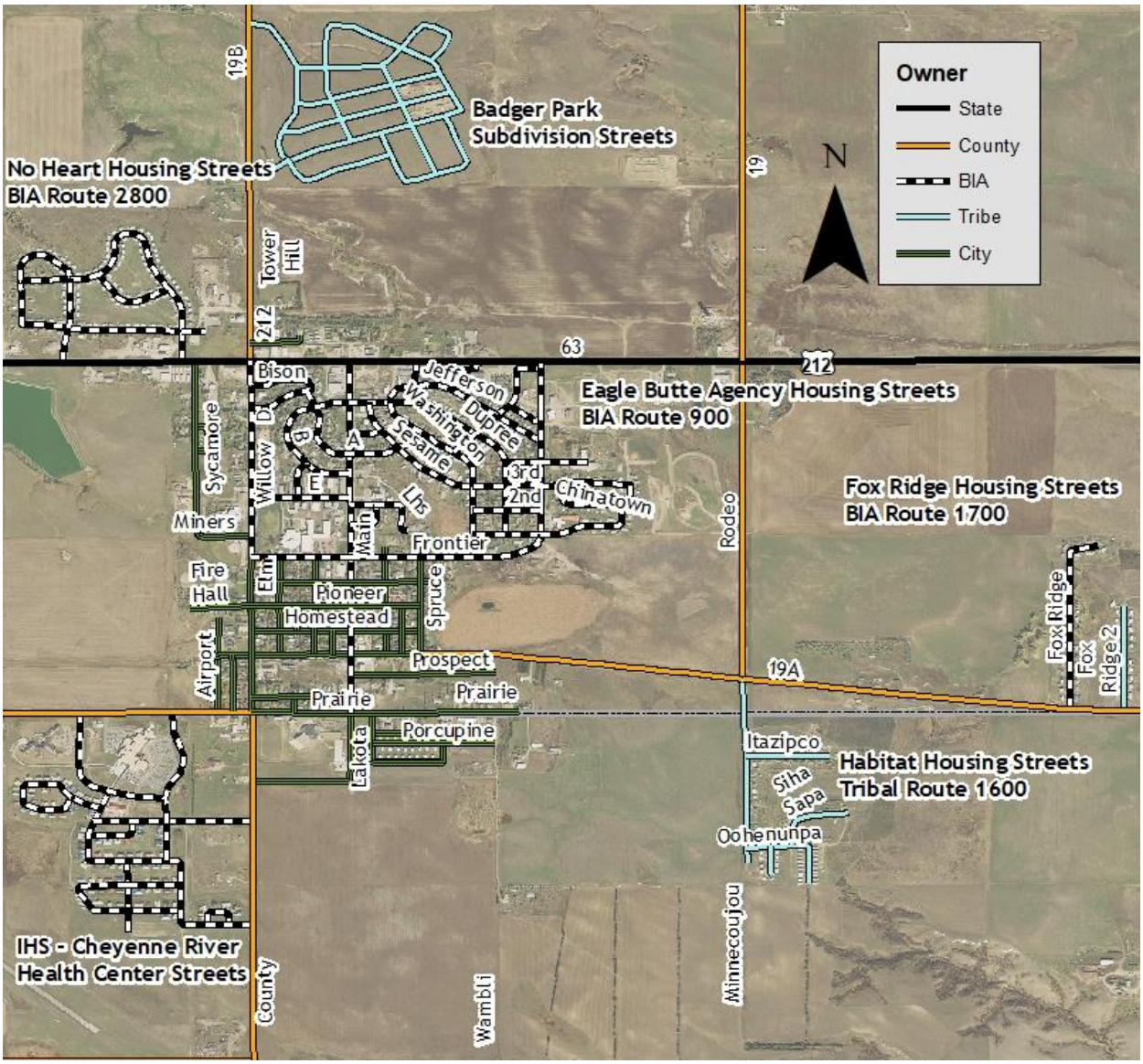


Figure 3-12 – Green Grass

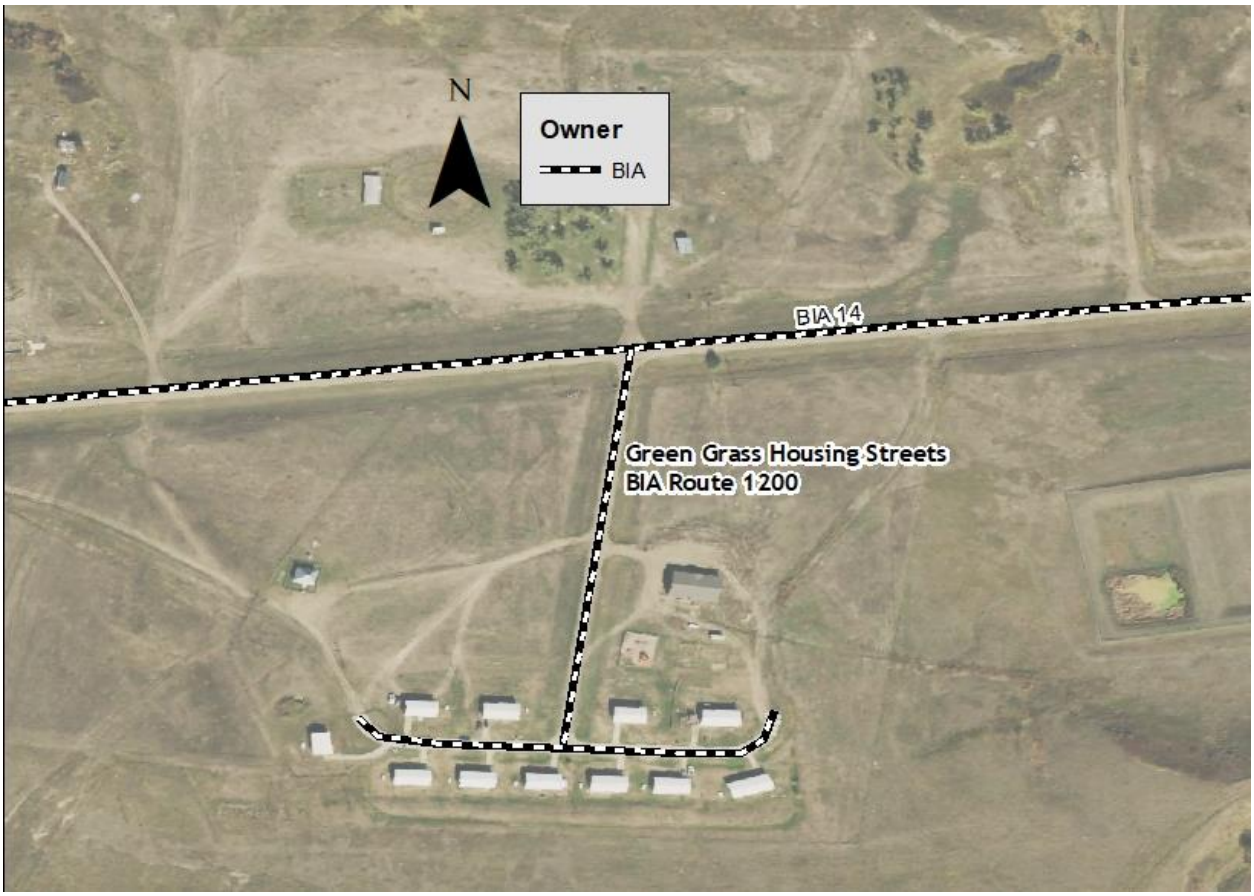


Figure 3-13 - Iron Lightening

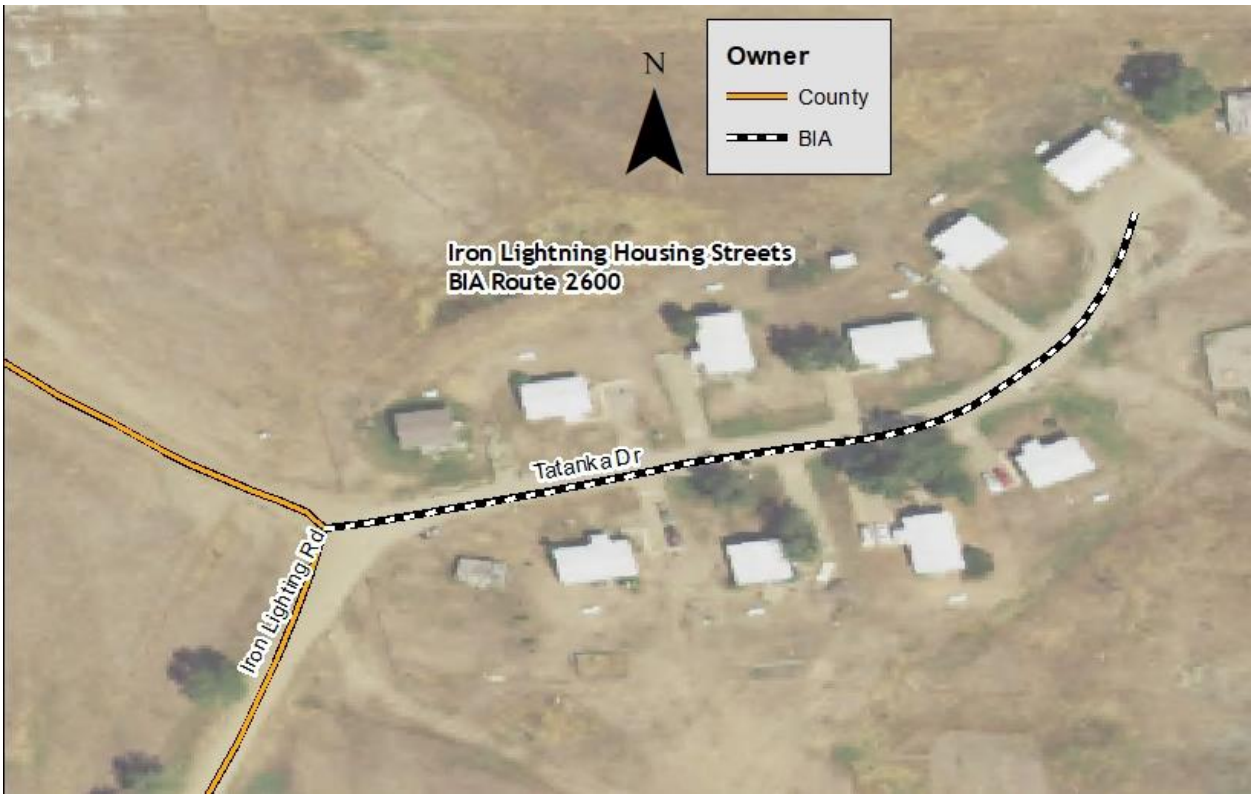


Figure 3-14 - LaPlant

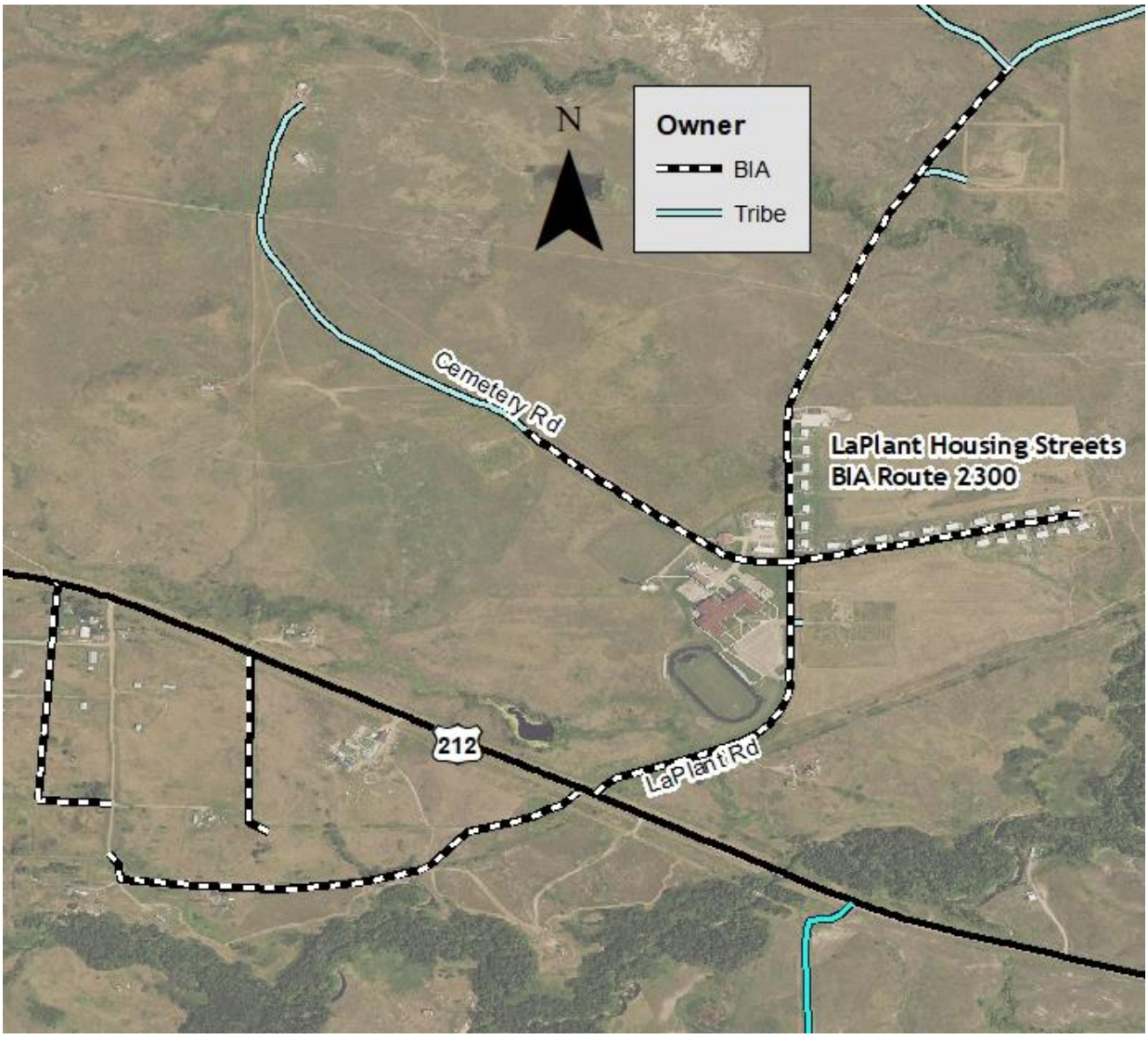


Figure 3-15 - Promise

Figure 3-16 - Red Scaffold

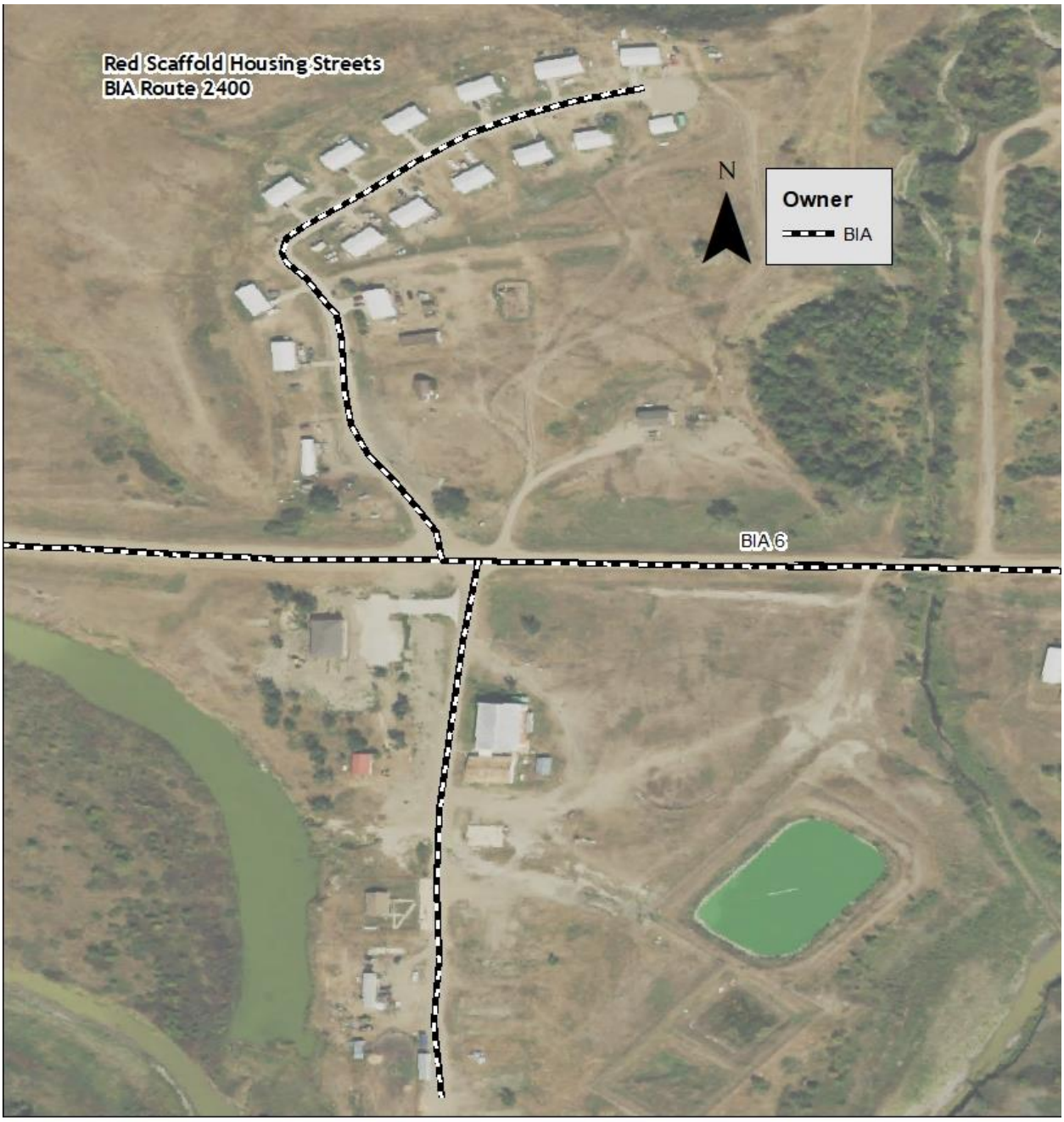


Figure 3-17 – Swiftbird

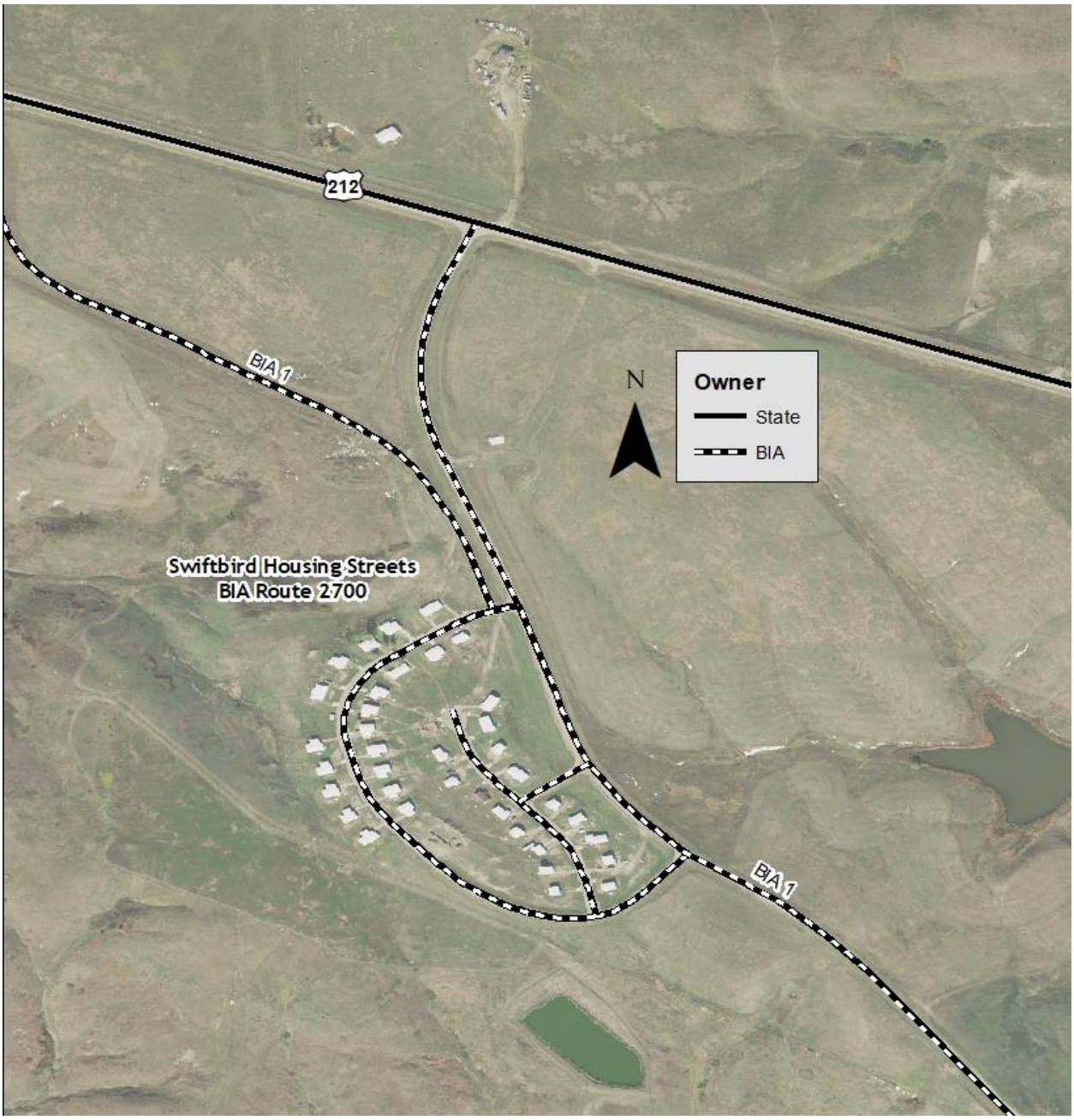


Figure 3-18 - Takini

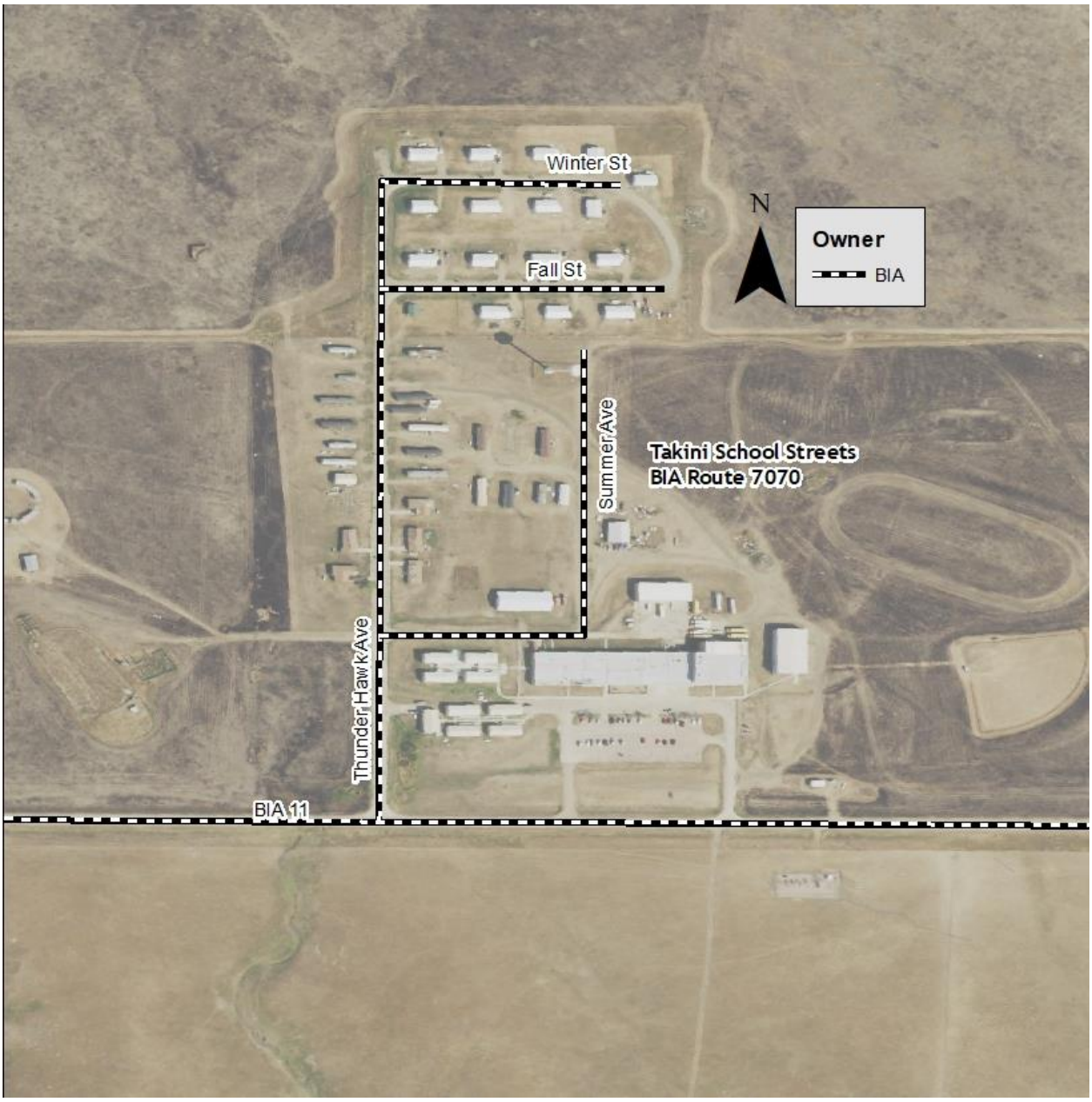
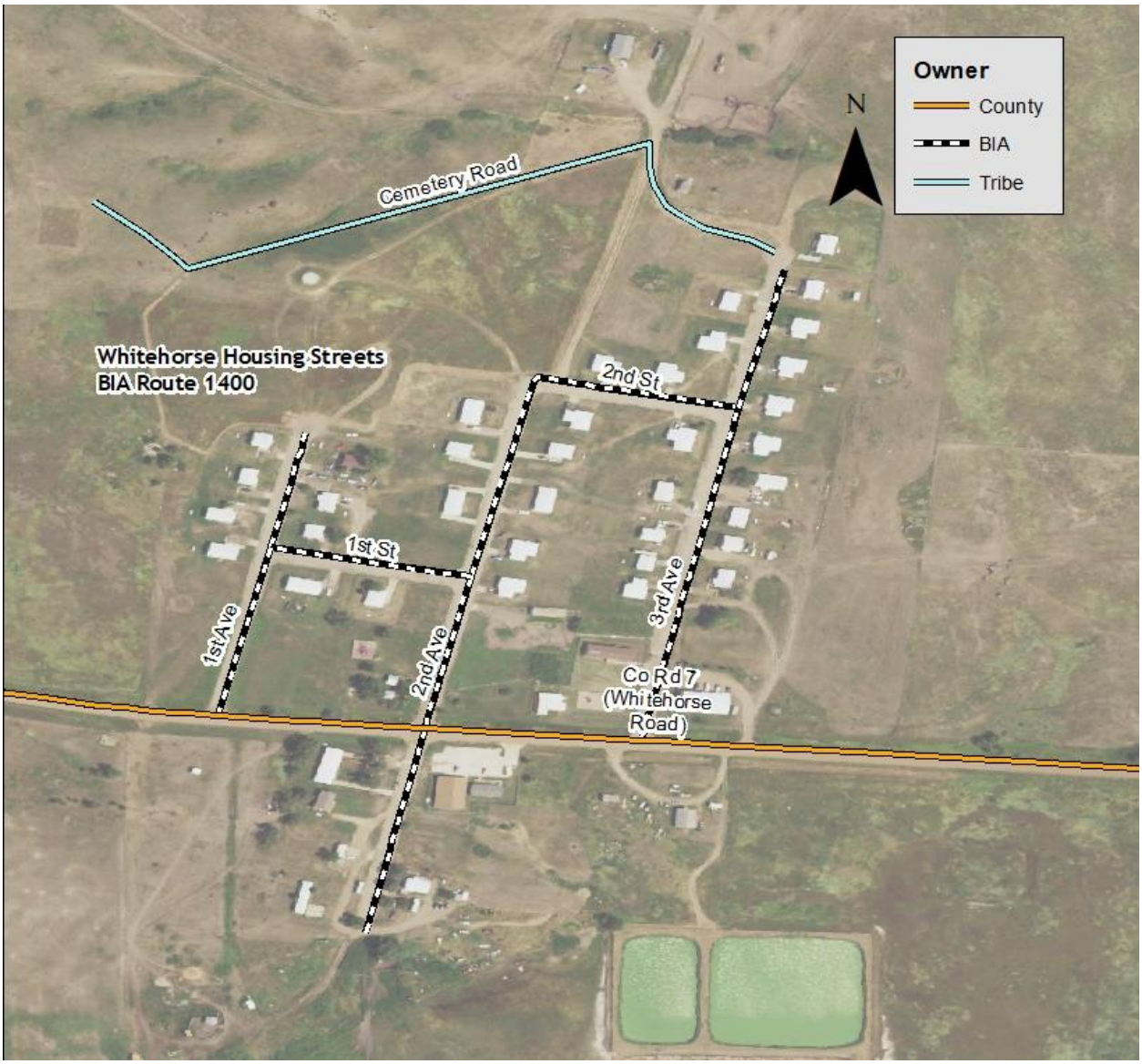


Figure 3-19 - Thunder Butte

Figure 3-20 - Timber Lake

Figure 3-21 – White Horse



Analyzing and updating CRST's inventory will not only enable the Tribe to meet the BIA's requirements for approved additions or changes, it also gives the Tribe an opportunity to discover and correct any discrepancies in the existing inventory. Inventory updates are also important because TTP funds are not permitted for use on a facility which is not listed in the NTTFI. An accurate inventory also enables precise and thorough mapping of Reservation transportation facilities.

When submitting updates to the RIFDS system, routes numbers should be edited to align with the Tribe's current naming convention within the system. For instance, the official 2019 RIFDS

inventory shows all Dewey County roads are numbered in an 8xxx series, and Ziebach County roads are 7xxx. The community housing streets do not have a consistent naming convention:

Community	BIA Route
Bear Creek	2200
Blackfoot	2500
Bridger	3001
Cherry Creek	2000
Dupree	1000
Eagle Butte Agency	900
No Heart Housing	2800
Habitat for Humanity Housing	1600
Fox Ridge Housing	1700
Green Grass	1200
Iron Lightning	2600
LaPlant	2300
Red Scaffold	2400
Swiftbird	2700
Takini	7070
Thunder Butte	2100
Timber Lake	2900
White Horse	1400

The Tribe has a long range inventory update project that should be undertaken when funding becomes available. (the cost shown is for addition, deletion, or modification of 20 routes):

Project #	Project Description	Project Type	Cost
32	Update Inventory - modify, delete, or add routes to NTTFI	Surveying, GIS, administrative	$ 35,000.00

SHARED USE PATH – EXISTING INVENTORY AND ADDITIONS

Shared use paths are important pedestrian and bicycle transportation facilities and serve a variety of functions. There is a significant population of Tribal members that lives near shared use paths in Eagle Butte. Shared use paths can provide shortcuts, recreation, and additional safety versus sidewalks or walking on the shoulder of a roadway. Although the Tribe has constructed some shared use paths, they are not in the inventory and need to be added. They include:

- Powwow grounds shared use path, Eagle Butte
- Fox Ridge Road shared use path, Eagle Butte

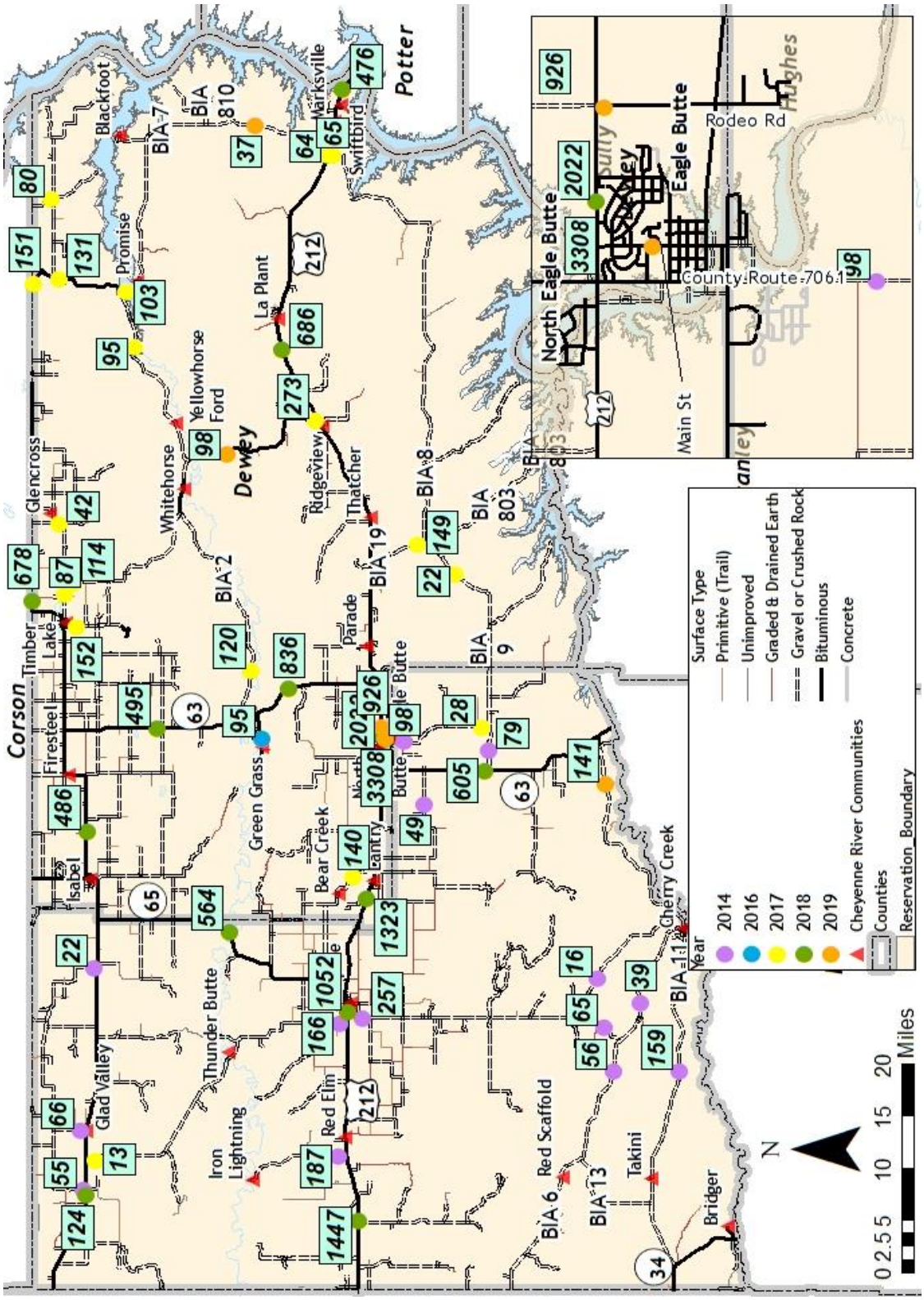
PARKING LOT ADDITIONS

There are currently no parking lots in the NTTFI inventory as the Tribe does not plan on spending any TTP funds on new construction or improvements of parking lots. Rather, these costs are the responsibility of developers and current owners so that TTP funds can be fully allocated to roads and shared use paths. It is not anticipated that any parking lots will be added to the NTTFI inventory, but this issue can be revisited in the future if so desired.

EXISTING AND PROJECTED TRAFFIC

Existing Average Daily Traffic (ADT) count data was obtained for CRST from the SDDOT website. Traffic count data was supplemented by traffic counts conducted in 2019 as part of this LRTP process. Available ADT data by year is shown in Figure 3-22. For an expanded view, see the 11x17 map in Appendix B.

FIGURE 3-22 – Existing Average Daily Traffic



A review of recent population growth suggests that traffic volumes on non-state corridors within the Reservation will stay relatively constant over time. The only expected appreciable increases in traffic will occur due to growth of through traffic on the federal and state highway systems or near locations of isolated growth associated with new developments.

Figure 3-23 shows traffic volumes projected to the year 2045. For an expanded view, see the 11X17 map in Appendix B. Calculations were performed on existing traffic counts using SDDOT multipliers.

Projected traffic volumes indicate that the current two-lane facilities will provide sufficient capacity over the next 20 years and beyond. Future traffic conditions at some intersections may lead to the need for some additional turn lanes and modifications in traffic control. These needs should be evaluated on a case by case basis.

Most trips are generated by towns and subdivisions within the Reservation, although there are a significant number of pass through trips located primarily on the state and federal highway systems. Some of the highest trip generators within the Reservation include gas stations, stores and eating establishments, schools, health care facilities, and cultural sites.

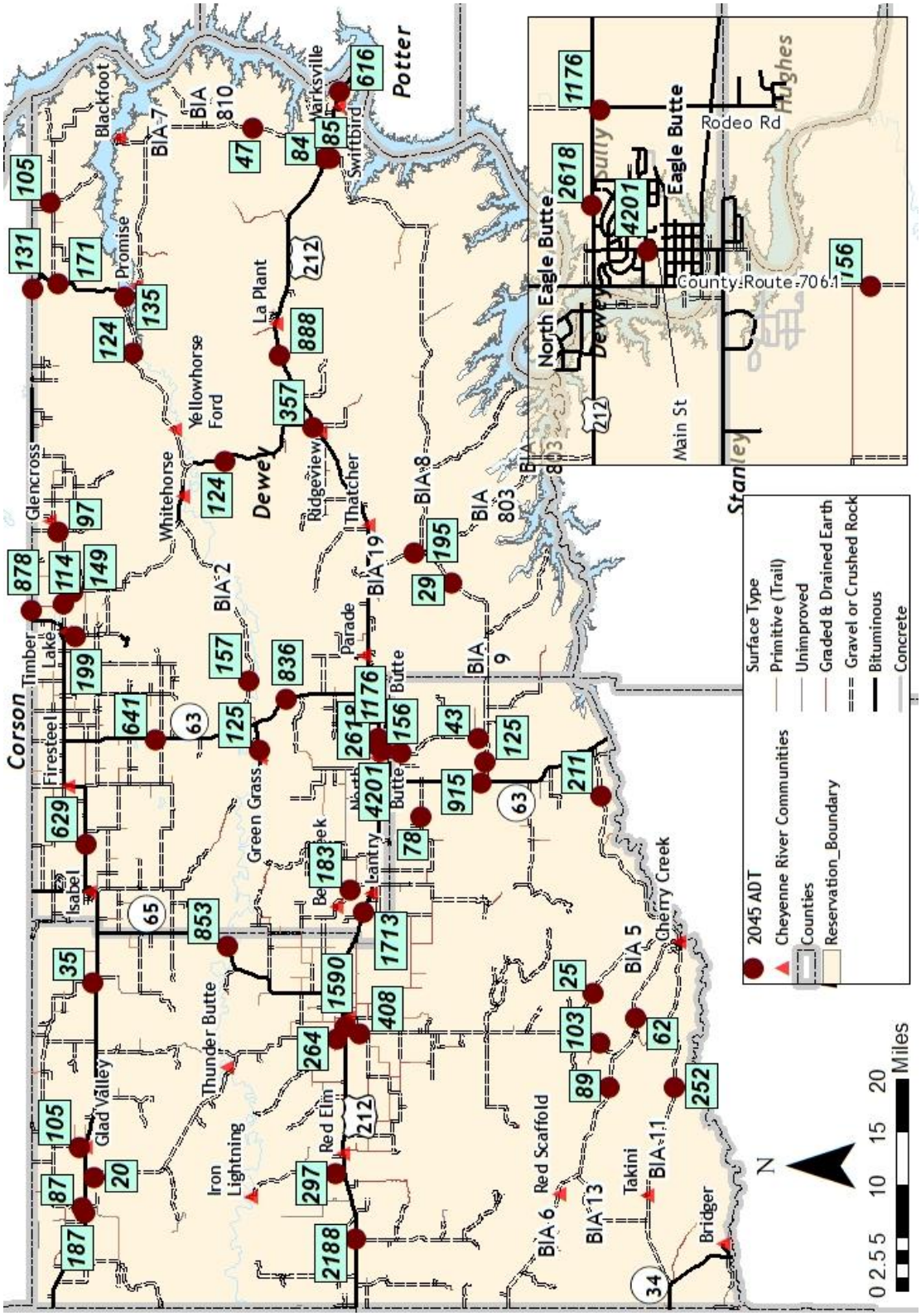
ROAD CAPACITY AND TRAFFIC OPERATIONS

Roadway capacity and traffic operations work together in providing mobility to the traveling public. The capacity of a roadway is driven by the number of through and turn lanes available and the types of traffic control being used. Traffic operations are also governed by traffic control, but other factors such as roadway geometrics, the level of access provided, and the presence of on-street parking can have a heavy impact on traffic operations.

Based on a review of existing daily traffic volumes on the major corridors, and considering projected growth, no traffic capacity issues exist or are expected to occur within the foreseeable future.

Given the extensive road system that exists, it is reasonable to assume that some localized roadway capacity and traffic operational issues exist. Traffic flow may also be impacted by some road sections susceptible to flooding and snow drifting. These should be addressed over time as each corridor and intersection is evaluated as part of future transportation recommendations and project improvements.

Figure 3-23 – 2045 Projected Average Daily Traffic



SAFETY

This section analyzes crash and safety data extracted from the 2015 Tribal Transportation Safety Plan (TTSP) for the years 2005 through 2013 and crash data obtained from the South Dakota Department of Public Safety (SDDPS) and the SDDOT.

The majority of crash and safety data and analysis was extracted from the 2015 TTSP and supplemented with more recent crash counts. According to the SDDPS there were approximately 670 total crashes on the Cheyenne River Indian Reservation that resulted in 29 fatalities and 154 injuries from 2005 to 2013.

A considerable number of these crashes occurred on the state highway system, primarily due to the high traffic volumes on those roadways. Information obtained from the SDDPS for the years 2014-2018 revealed a total of 223 crashes with one fatality and 29 injuries, a significant reduction from previous crash analysis. Figure 3-24 illustrates the improvements that were obtained in the most recent five years of crash data.

Figure 3-24 – Crash Data 2006-2018

	Total Crashes	Yearly Average	Fatalities	Yearly Average	Injuries	Yearly Average
2005-2013	670	74.4	29	3.2	154	17.1
2014-2018	223	44.6	1	0.2	29	5.8

Even with reductions in crash frequency and fatalities, there is still much that can be done to increase transportation safety on the Reservation. The 2015 TTSP identified transportation safety issues that are causing crashes, increasing crash severity, or restricting complete data analysis. These safety issues included:

- Animal crashes
- Lack of seatbelt use
- Impaired driving
- Overturning/rollover crashes
- Crashes with fixed objects
- Departure from roadway
- Lack of or inconsistent crash data collection and sharing
- Young drivers
- Need for improved lighting at night

The TTSP identified other transportation safety issues based upon personal experience by the group of participants involved in the development of the TTSP. This group included city, county, state, federal, and Tribal safety representatives from engineering, enforcement, education, emergency disaster services, and the school systems.

These issues, if not properly addressed, may cause crashes, increase crash severity, or create other transportation safety concerns in local CRST communities:

- Seat belt usage
- Sharing data among agencies
- Maintenance of gravel roads/lack of gravel
- Access for school buses
- Load limits
- 911 system locations not matching roadway inventory
- Jurisdictional issues
- Distracted driving
- Lack of shared use path lighting
- Pedestrian crossing of US 212
- Failing culverts

Capturing and analyzing crash data is an important component of a Tribal Safety Plan. It is used in the identification of safety issues on the road system and aids in the development of improvements. Most federal and state safety funding grants request crash data to support grant applications.

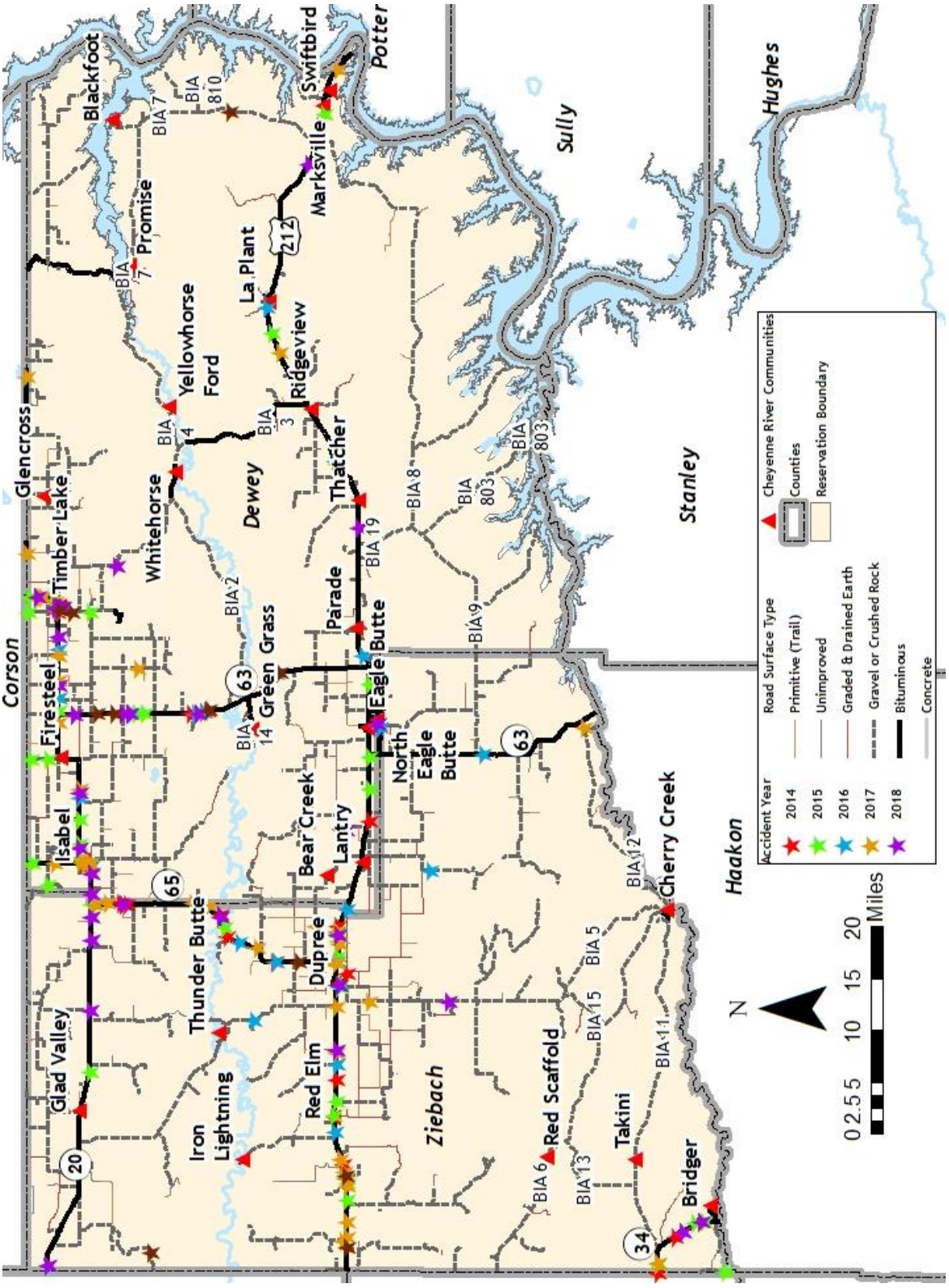
Crash data provided by the SDDOT differed slightly from the SDDPS, showing that between the years 2014-2018 there were 190 crashes on the Reservation with 2 fatalities and 33 injuries. The crash map in Figure 3-25 is based on SDDOT crash data. An expanded map view is available in Appendix B.

The 2015 TTSP offered numerous recommendations and strategies for improving transportation safety on the Reservation. These were prioritized around the 4Es of safety: education, enforcement, engineering and emergency response, and are outlined in the following bulleted list:

- Education
    - Develop a Reservation-Wide Transportation Safety Education Program: The CRST received a Tribal Transportation Program Safety Fund grant in 2015 to implement a safety education program. The goal was to build on national safety campaign themes on driving, seat belt use, texting and driving, and other transportation safety issues.

      The funding allowed for billboards, banners, videos, posters, and other safety education materials designed with elements of Tribal culture to be displayed within the school system and during Powwows, fairs, and other community events.

FIGURE 3-25 – Cheyenne River Indian Reservation Crashes 2014-2018



- Enforcement
    - Participate in efforts to pass a primary seat belt law: Currently South Dakota has a secondary seat belt law, meaning that violations can only be cited if the driver is stopped for a different infraction. Furthermore, only the driver and front seat passengers younger than 18 are required to use a seat belt. A primary seat belt law passed through Tribal Council would increase drivers' and passengers' safety.
    - Provide a Tribal highway safety officer: Currently the Tribe has one officer dedicated to highway safety enforcement and drug and safety training. With the limited staffing and the demands on time that criminal activities require, highway safety enforcement and education often become a lower priority. Tribal Law Enforcement should pursue funding for one additional officer.
    - Implement electronic crash record system and data sharing among agencies: Currently Dewey County, Ziebach County and the CRST collect crash data differently. Placing all three agencies on the same system will allow for better information sharing and develop a complete set of crash data for the Reservation. Dewey County uses the Traffic and Criminal Software (TraCS) electronic crash records system. It is recommended that Ziebach County and the Tribe implement this system as well.
    - Initiate discussions on use of cross jurisdictional agreements: With staffing challenges faced by all enforcement agencies, many Tribes, states, and local jurisdictions have entered into cross jurisdictional agreements. This has allowed for increased traffic enforcement during key events such as Powwows. There is currently no such agreement in place on the Cheyenne River Sioux Reservation. The increased traffic enforcement benefits and effects on Tribal sovereignty of an agreement should be presented to the Tribal Council for consideration.
    - Develop a motor carrier enforcement program: With the presence of US 212 bisecting the Reservation and the agricultural activity in the area, there is a high number of large trucks. According to SDDOT data, there were around 11 million vehicle miles traveled by heavy trucks in Ziebach and Dewey counties in 2017.
    - Currently there are no weigh stations within the Reservation and the Tribe is concerned with overweight and unsafe trucks operating on roadways, many which already have safety issues. Other Tribes have established motor carrier enforcement programs that can regulate trucking activities and use portable scales to check vehicle weights. CRST could implement ordinances that would be used to regulate trucks and obtain portable scales to be used on the Reservation.
    - Update Tribal traffic code: CRST currently has a traffic code for enforcement on the Reservation. It includes many items from the state code but has not been updated in recent years. Title 32 of the South Dakota Codified Laws includes a comprehensive section on motor vehicles that could be used for reference to determine changes and updates that would be beneficial to the CRST.

- Engineering
    - Perform Road Safety Audits (RSAs): RSAs are an important tool because they provide an opportunity to bring traffic and safety expertise to assess safety concerns of routes where there are high numbers of crashes or where other concerns have been identified. The goal of the RSAs is to identify safety issues and then develop safety improvements. To build on these improvements and the use of RSAs, it is recommended that the Tribe pursue funding to perform RSAs on BIA, Tribal, and county roadways within the Reservation.
    - Develop sidewalk and shared use paths: Locations have been identified where separated shared use paths and lighting would be beneficial to creating safer pedestrian and bicycling opportunities. They include:
        - Lighting for Fox Ridge Road shared use path, Eagle Butte; lighting has been installed along part of the shared use path. The project was put on hold until additional funding can be obtained.
        - Shared use path along US 212 to include a crosswalk, La Plant.
    - Identify and replace failing roadway culverts: An inventory conducted by the CRST Department of Transportation identified 90 culverts on main BIA routes that were in a failed or failing condition. The culverts present a safety issue to the traveling public when they fail and collapse. Culvert failure has increased after flooding during Spring 2019.

- Emergency Management Systems
    - Improve 911 addressing system: Currently the Tribe does not have an enhanced 911 system, which means that when a call is received by a 911 operator, formal location information is unavailable. This requires the operator to get more detailed location information, increasing the time it takes to dispatch an emergency vehicle.
    - Many roads may not be signed or may be known by a local nickname that is not easily identifiable by either the dispatcher or responder. It is recommended that the Reservation system be upgraded to include location information for quicker response times. The Tribe has received funding to assist in installation of intersection signage specifically to assist in emergency response.

- Safety Planning/Other Strategies
    - Improved Roadway Maintenance: Like many other large land-based Tribes, the CRST faces a financial obstacle with providing basic roadway maintenance. The funding provided through the Department of Interior (DOI) is insufficient for the extensive road miles for which they have jurisdiction. The Tribe currently allocates 25% of TTP funds to the maintenance program which results in the reduction of needed roadway improvement projects. It is recommended that the CRST seek additional funding through federal programs.

Figure 3-26 lists the projects that have been programmed into the current five year TTIP. Projects 1-4 result from flooding in 2019 and each project number has multiple sites including washed out culverts and road sections that require safety improvements.

Figure 3-26 – CRST TTIP Safety Projects

CRST - PROJECTS IN TTIP - FY 2021-2025						
Project #	**Project Name**	**FY2021**	**FY2022**	**FY2023**	**FY2024**	**FY2025**
1	ERFO Project*	$100,000.00				
2	FEMA Storm 4440**	$441,000.00				
3	FEMA Storm 4463**	$0.00				
4	FEMA Storm 4467**	$8,000.00				
5	BIA Rt 6 Cherry Creek Slide	$500,000.00				
6	BIA 3 Moreau River Road		$750,000.00			

*ERFO funding anticipated

**FEMA funding anticipated

Long range safety projects are those which the Tribe has identified as safety improvement needs and that they desire to have completed, but do not yet have available or anticipated funding. Figure 3-27 is a list of safety projects to be completed as funding becomes available.

Figure 3-27 – CRST Long Range Safety Projects

CRST Long Range Safety Projects				
Project #	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
33	NTTFI Route 7061	Eagle Butte south of 2nd Airport Rd, Ziebach Co	Curve flattening and safety updates	$1,172,500.00

Total $1,172,500.00

CHAPTER 4 - PUBLIC INVOLVEMENT

This section discusses the meetings and public input held and received during the LRTP process. As required by the Federal Register, the public involvement process was established to provide an early opportunity for input, as well as, an opportunity for review and comments on the draft LRTP.

PUBLIC INPUT RECEIVED – ISSUES AND NEEDS

Kickoff Meeting

A kickoff meeting for the CRST LRTP was held on March 18, 2019, at the Four Bands Community Fund building in Eagle Butte. A formal agenda for the meeting was not created due to a potential scheduling conflict with another Tribal meeting. The meeting started at 1:00 pm and was adjourned at 4:45 pm, with 12 attendees from the CRST. The following bulleted list outlines the main topics covered:

- Craig Genzlinger from KLJ presented a PowerPoint slideshow explaining the legislation behind the TTP program, allowable uses of TTP funds, applying for grant monies, elements that should be addressed in the LRTP, and the five year TTIP.
- The current road inventory according to the 2018 NTTFI report was discussed. There are many routes that need to be added to the inventory. The decision was made to not add parking lots to the inventory, even though they are eligible for TTP funding. It was believed that individual entities should seek their own grants or set aside their own funds to pay for parking lot improvements.
- There are potential issues regarding established right of way on the Reservation. If existing platted right of way is unavailable, it may be necessary to purchase it.
- Snow removal is an essential element of road maintenance on the Reservation. It has been difficult to hire and retain qualified equipment operators. The Tribe expressed a desire to acquire GPS coordinates where drifting covers roadways and build snow fences in those areas. The Tribal TERO representative explained that his program can support training for potential equipment operators to assist with snow removal.
- Safety grant funding was discussed. CRST has not received funding for any of the applications that were submitted. There needs to be a safety grant application submitted for funding to straighten the curves on County Road south of Eagle Butte. There is a possibility this could be a joint venture with the county covering some or all costs exceeding the amount of the grant.
- The vision for the CRST Transportation System was discussed and includes the following:
    - Travel to and from Eagle Butte, Cherry Creek, and hospitals is key
    - US 212 is a top priority for the Tribe
    - Need to fix 7 miles from Takini west (BIA 11)

- The Tribe would like to take over jurisdiction of all state and county roads
- Get away from NHASDA formula for population
- Update mileages for NTTFI mileage that is funded

- The many needed road and bridge improvements were discussed as well as the need for additional pedestrian and bicycle facilities. All the identified needs are incorporated into this plan.

Public Input

A public notice will be published on the CRST's website announcing that the LRTP is available for review and comment. A notice will also be displayed in each community hall reservation wide. Public comments will be accepted for 30 days commencing on date of publication.

CHAPTER 5 - EXISTING CONDITIONS & RECOMMENDATIONS

Chapter 3 of the report provided an inventory and analysis of data necessary to assess existing conditions for the transportation system. This chapter provides an evaluation of the transportation facilities found on the Reservation by providing a review of existing conditions followed by recommendations for each facility.

The transportation facilities that were evaluated include flood damaged roads and culverts, paved and non-paved roads, roadside elements, freight and trucking, bridges and culverts, pedestrians and bicycles, airports, transit, and utilities.

FLOOD DAMAGED ROADS AND CULVERTS

This section of the report examines the existing conditions of roads, bridges, and culverts damaged by flooding that occurred in the Spring and Summer of 2019. Recommendations are provided at the end of this section.

EXISTING CONDITIONS

From March 2019 through July 2019 many South Dakota counties experienced severe snowstorms and rainstorms. These weather events led to flooding that affected most of the state including Dewey and Ziebach counties. As a result, FEMA issued three Major Disaster Declarations for damages that occurred during this time frame:

1. DR-4440 was declared on June 7, 2019 for dates March 13, 2019 through April 26, 2019. Figure 5-1 shows the counties impacted and the types of assistance for which they qualify.

2. DR-4463 was declared on September 23, 2019 for dates May 26, 2019 through June 7, 2019. Figure 5-2 shows the counties impacted and the types of assistance for which they qualify.
3. DR-4467 was declared on October 7, 2019 for dates June 30, 2019 through July 21, 2019. Assistance for this disaster will be updated at a later date and will be displayed at fema.gov.

FEMA issued maps showing designated counties and assistance types are shown in Figures 5-1 through 5-3.

There was a fourth Major Disaster Declaration declared in South Dakota on November 18, 2019. All impacted counties are located in the southeast part of the state; Dewey and Ziebach counties were not included in the designated counties.

Figure 5-1 – South Dakota Disaster Declaration FEMA-DR-4440

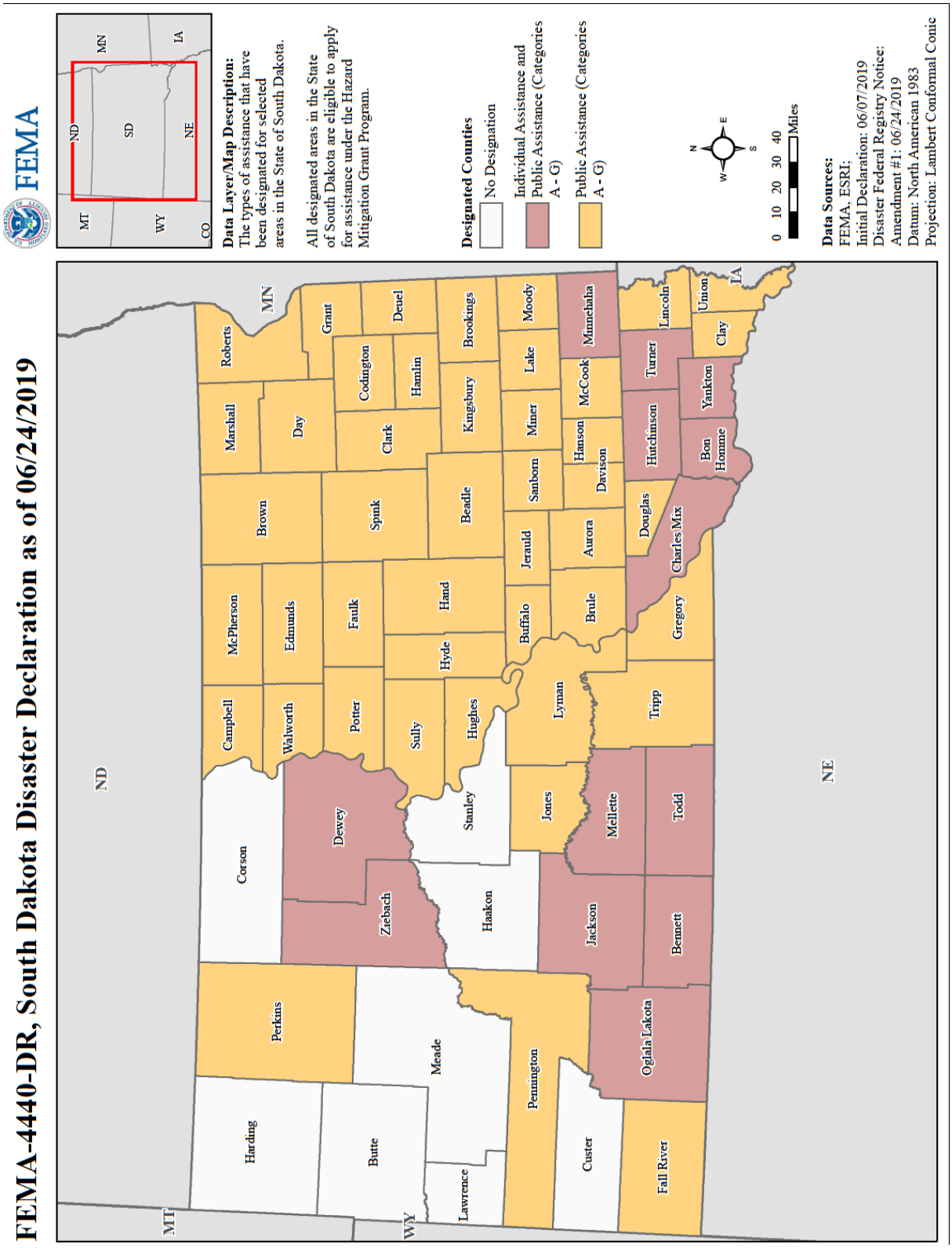


Figure 5-2 – South Dakota Disaster Declaration FEMA-DR-4463

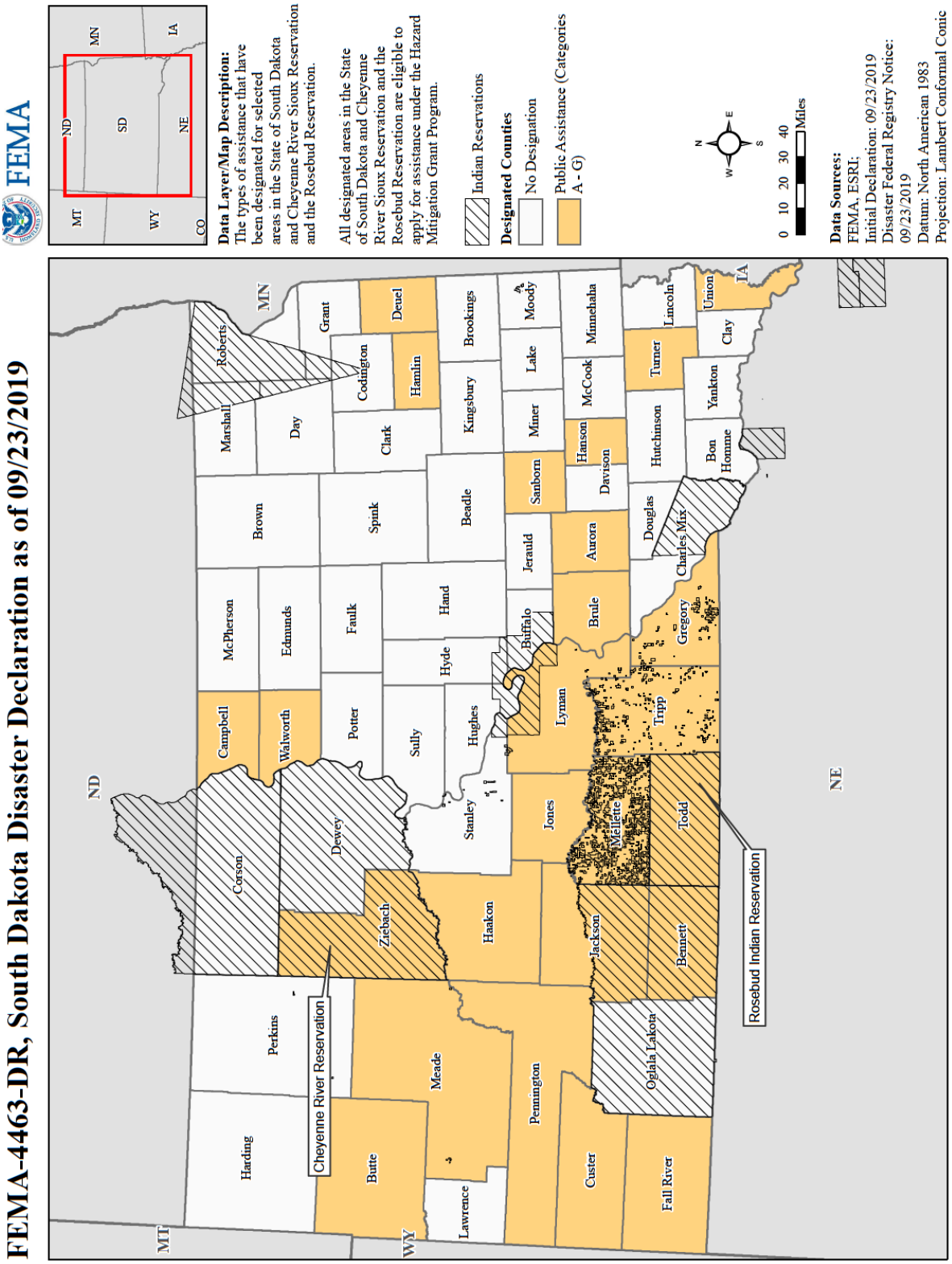


Figure 5-3 – South Dakota Disaster Declaration FEMA-DR-4467

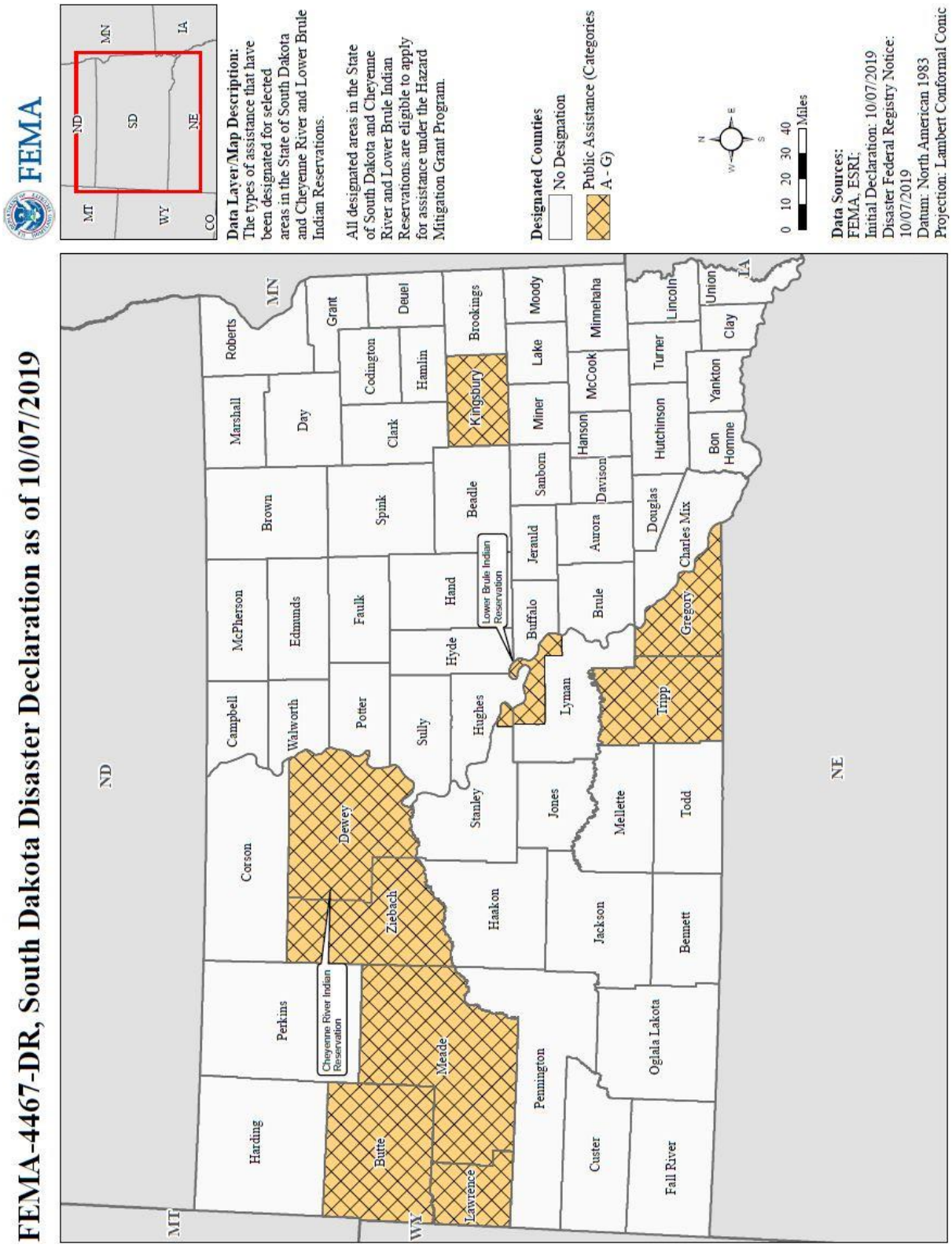


Figure 5-4, while not all-inclusive, lists damages that were found during post-flood inspections and cost estimates associated with repairs.

Figure 5-4 - Spring 2019 CRST Flood Damages

Route and MP (MM)	Type of Damage Incurred	Cost Estimate for Repairs	Mitigation Performed by Tribe or BIA
Rt 3 MP 13	overtop, scour, and major gravel loss	$83,000.00	
Rt 3 MP 14.2	Moreau River encroachment to shoulder of road	$1,320,000.00	
Rt 3 MP 16	overtop, scour, and gravel loss	$60,640.00	
Rt 3 MP 20.9	overtop, scour, and gravel loss	$31,980.00	
Rt3 MP 24.5	overtop, shoulder scour and wash, gravel loss	$21,600.00	
Rt 3 MP 26	overtop, major scour, loss of double chip seal, guardrail damage, shoulder erosion	$60,700.00	
Rt 7 MP 1	major culvert washout	$1,555,000.00	emergency detour constructed
Rt 7 MP 2.2	culvert washout	$11,100.00	replaced culvert
Rt 7 MP 22.7	pipe outlet erosion	$11,500.00	
Rt 7 MP 25.8	culvert dammed up then washed through, inslope failure,	$32,100.00	
Rt 7 MP 26.2	shoulder erosion, scour, plugged culvert	$13,100.00	
Rt 7 MP 26.8	inlet erosion	$8,300.00	
Rt 7 MP 28.1	major gravel loss from flood waters; overtopped road at least 4 separate times.	$20,200.00	
Rt 8 MP 15.9	overtop, scoured inslope of roadway, culvert ends buried	$6,600.00	will muck out pipe to determine condition
Rt 8 MP 16.8	culvert washout and road failure	$28,800.00	repaired as emergency
Rt 9 MP 3.9	overtop and scour, water running under 3' CMP	$6,500.00	
Rt 9 MP 4.7	overtop and scour	$11,100.00	
Rt 9 MP 6.9	culvert with severe scour at outlet	$21,500.00	
Rt 9 MP 8	culvert with scour at both ends and void under road	$1,475,000.00	
Rt 9 MP 12.1	culvert and road washout	$1,575,000.00	
Rt 9 MP 12.6	major outlet scour, stream bed dropped	$28,300.00	
Rt 9 MP 13	culvert with scour at both ends and void under road	$80,000.00	
Rt 9 MP 15.2	major outlet scour, stream bed dropped	$23,300.00	
Rt 9 MP 16.9	culvert with scour at both ends and void under road	$1,725,000.00	
Rt 802 MP 6.7	culvert washout and road failed	$7,200.00	
Rt 802 MP 8.7	culvert with scour and void under road, road failure	$8,100.00	
Rt 809 MP 1.2	slide	$1,200,000.00	emergency detour constructed
Rt 12 MP 9.5	slide	$1,200,000.00	emergency detour constructed
Rt 12 MP 7.7	erosion at Big Cottonwood Creek Bridge	-	repaired erosion

Applications for FEMA assistance have been submitted for many of these sites. Many of these damages may also be eligible for funding through the Emergency Relief for Federally Owned Roads (ERFO) Program.

RECOMMENDATIONS

As evidenced by the table of damages shown in Figure 5-4, flooding can lead to a myriad of damages within a transportation system. Unfortunately, most climate change experts predict that the extreme weather events that cause these types of damages are going to increase in frequency in coming years.

Damaged transportation facilities can be expensive to repair and often divert funds that could be used on other projects. Additionally, community residents experience travel delays when they must first wait out the flood and then construction as repairs are made.

It is recommended that the Tribe undertake a Reservation-wide culvert inventory to assess current conditions. This will increase the Tribe's ability to determine more precisely the extent of flood damages and the time frame within which they occurred. This documented information may help secure emergency funding for repairs.

When new roads or road improvements are being designed along routes that have a history of overtopping, road embankments should be built using methods that resist washing out after flooding. Researchers at the University of Minnesota have collaborated with engineers from the Minnesota Department of Transportation (MnDOT) to develop methods to use along the Red River Valley in Minnesota, North Dakota, and South Dakota. Here, the most problematic roads are east-west roads that cut across rather flat prairie or agricultural areas, similar to conditions found on the Reservation. They have found that the following methods show promise with scour prevention and erosion control:

- Turf reinforcement mat or armor
- Matrix riprap
- Reduced slopes
- Rubber liner
- Water tube with apron

PAVED ROADS

This section of the report examines the existing conditions of paved roads prevalent within the Reservation. Recommendations are provided at the end of this section.

EXISTING CONDITIONS

There are approximately 60 miles of paved BIA and Tribally owned roadways on the Reservation, consisting almost entirely of 2-lane asphalt roads; some community streets are 2-lane concrete and a short section of 4 lane asphalt road is located in Eagle Butte. Funding levels have made extensive regular overlays, reconstruction, seal coats, and other maintenance challenging to routinely perform. While some BIA owned paved roads on the Reservation are in good condition, most are in fair to poor condition and in need of repair. Images of paved roadway conditions found on the Cheyenne River Indian Reservation are shown in Figures 5-5 and 5-6.

Figure 5-5 - Paved Roadway Conditions - Rural

BIA 1, Swiftbird

BIA 3

Figure 5-6 - Paved Roadway Conditions - Urban

Green Grass Housing Street

Eagle Butte Housing Street

The SDDOT is responsible for the maintenance of State and United States highways within the Reservation. Routine maintenance of the State and US highway system includes:

- Snow removal
- Annual crack sealing and patching
- Culvert repair
- Shoulder grading
- Weed spraying
- Guard rail repair
- Mowing

In 2018, the SDDOT entered into an agreement to design, contract and construct new and upgraded signing and delineation along all paved roads within the Reservation. Gravel road signing will be addressed in a follow-up project.

Pavement Surface Evaluation and Rating (PASER)

Roadway surface types and conditions are a significant concern on the Reservation. The paved highways within the Reservation cover the entire range of good to poor condition. The condition of paved streets, both in towns and in subdivisions, also vary from good to poor condition.

PASER ratings were performed in 2019 to assist the CRST in identifying paved roadway conditions and prioritizing improvements based on a range of factors. These factors included roughness (ride), surface distress (condition), surface skid characteristics, and structural characteristics (potholes, cracking, etc.). Based on the PASER rating, different maintenance tasks are needed to maintain or raise the rating for each roadway. By continuing to ensure that a good roadway remains a good roadway, its life can be extended for a far lower upfront cost than by waiting until a more intensive maintenance method is required.

To determine the PASER rating of each segment of roadway, each mile of paved BIA road was driven, visually inspected, and given a rating of between 1 and 10 based on engineering principals. Factors such as the amount of cracking, potholes, rutting, shoulder condition, ability to drive at full speed, and the presence of gravel were all considered in rating the road segments.

The properties of each road were measured using the first one hundred feet of each mile. Consistency was important in the rating. Each of the rating values was defined and kept consistent throughout the PASER rating process. For example, severe cracking on a roadway rated it as a five and each instance of severe cracking was rated as a five consistently. The following images provide an example of each PASER rating and explanation of typical conditions.

PASER Rating of 1:

A PASER rating of 1 indicates a failed roadway. It is essentially a gravel road which needs full reconstruction. An alternate treatment method is keeping the roadway as is, with a gravel surface. Example: BIA Route 2700, Swiftbird housing street.

PASER Rating of 2:

This rating indicates heavy gravel patches on failed asphalt with limited pavement intact. No striping exists and shoulders are deteriorated. This road cannot be traveled safely at the posted speed limit. Drivers need to slow down. Example: BIA Route 7070, Takini housing streets, Thunder Hawk Avenue.

PASER Rating of 3:

Roads with a PASER rating of 3 are in poor condition and demonstrate severe cracking and rutting with moderate visible potholes. There is heavy patching including newer patches placed over older patching. There is limited striping and shoulders are deteriorated. Areas are marked with flags. This road cannot be traveled safely at the posted speed limit. Drivers need to slow down. Example: BIA Route 1, Swiftbird

PASER Rating of 4

This is also a poor rating. Roads characteristics include heavy cracking and rutting with moderately visible potholes. There is heavy patching with newer patches placed over older patching. There is limited striping and shoulders are deteriorated. Cracks are not sealed. The entire road is undrivable at the posted speed limit. Drivers need to slow down in areas. Examples: BIA Route 1600, Habitat for Humanity housing streets, Mnicoujou Drive south of Fuller Street.

PASER Rating of 5:

This rating indicates roads in fair condition, with moderate to heavy cracking and moderate rutting. There is moderate patching with some new on old patches and limited striping. Cracks are mostly not sealed. It is safe to travel this road at the posted speed limit. Example: BIA Route 2300, LaPlant housing streets, LaPlant Road.

PASER Rating of 6:

Roads with a PASER Rating of 6 will show light signs of aging and are in fair condition. Moderate to heavy cracking or some raveling and rutting exists. There may be moderate polishing with occasional patches visible. Cracks are mostly sealed. Example: BIA 3 north of US 212 at mile marker 2.

PASER Rating of 7:

This rating suggests roads in good condition with some cracking but no raveling and little rutting. No patches are visible. Cracks are sealed. This roadway is not in need of immediate repair. Example: BIA 2100, Thunder Butte housing streets, Thunder Lane.

PASER Rating of 8:

No immediate maintenance is required on roadways with a PASER rating of 8. There is no cracking, raveling or rutting present, and no patches or sealed cracks are visible. Example: Cheyenne River IHS campus street, Eagle Butte.

PASER Rating of 9:

These roads will be in excellent condition. This will be a relatively new road with new striping, or a roadway that was reconstructed or overlaid recently. Example: There were no roads in the study area with a PASER rating of 9; a representative road is shown.

PASER Rating of 10:

This roadway was recently completed and considered in perfect condition with appropriate striping and shoulders. Example: There were no roads in the study area with a PASER rating of 10; a representative road is shown.

Paved roadways evaluated within Reservation boundaries were BIA 3, BIA 7, BIA 14, and community streets in Bear Creek, Dupree, Eagle Butte including No Heart housing, Habitat for Humanity housing, and Fox Ridge housing, Green Grass, Iron Lightning, LaPlant, Swiftbird, Takini, Thunder Butte, Timber Lake, and Whitehorse. Every one-mile segment of highway and each block of community streets were given a PASER rating and the results were mapped. Figures 5-7 through 5-22 are maps that display the PASER ratings in a color-coded system.

Figure 5-7 - PASER Ratings – BIA 3

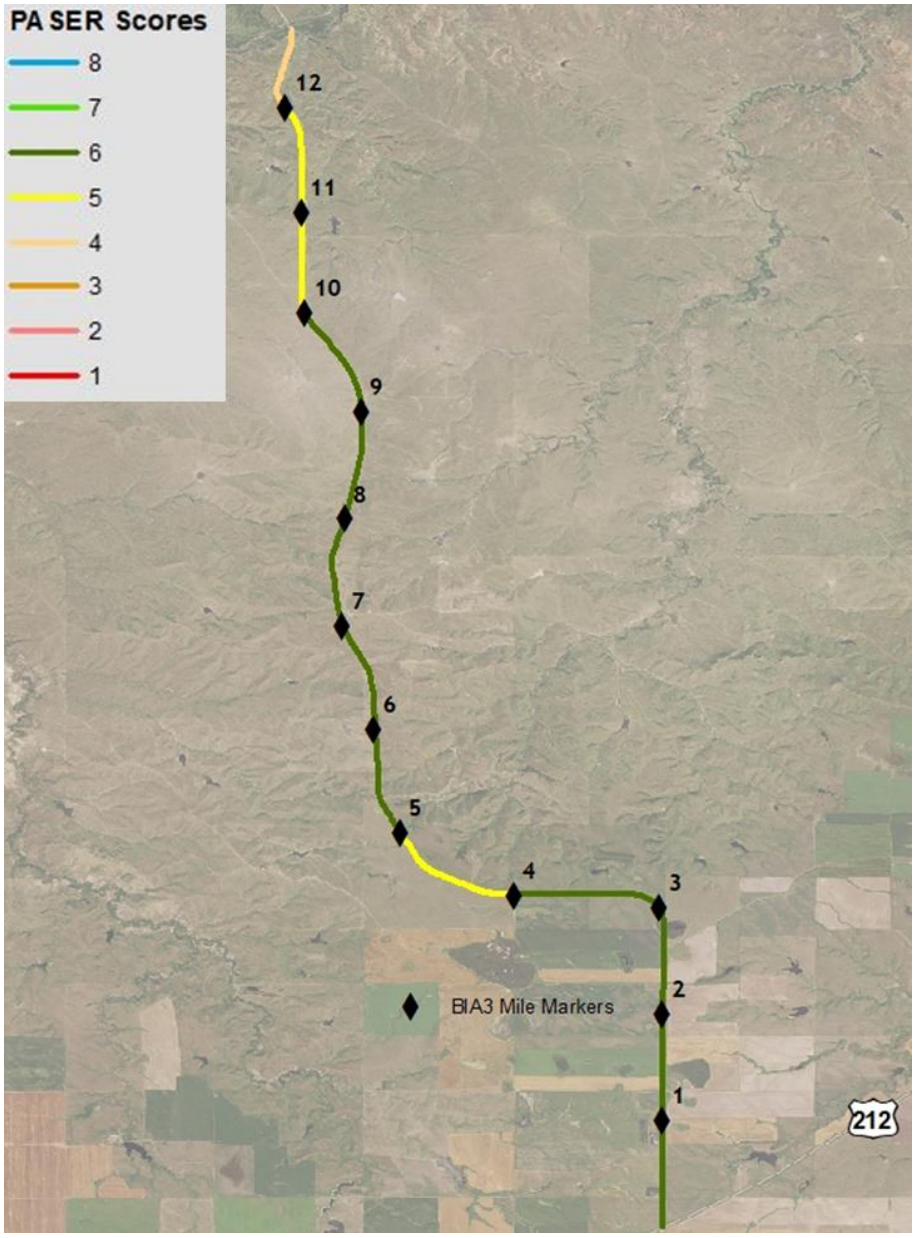


Figure 5-8 - PASER Ratings - BIA 7 North of Moreau River

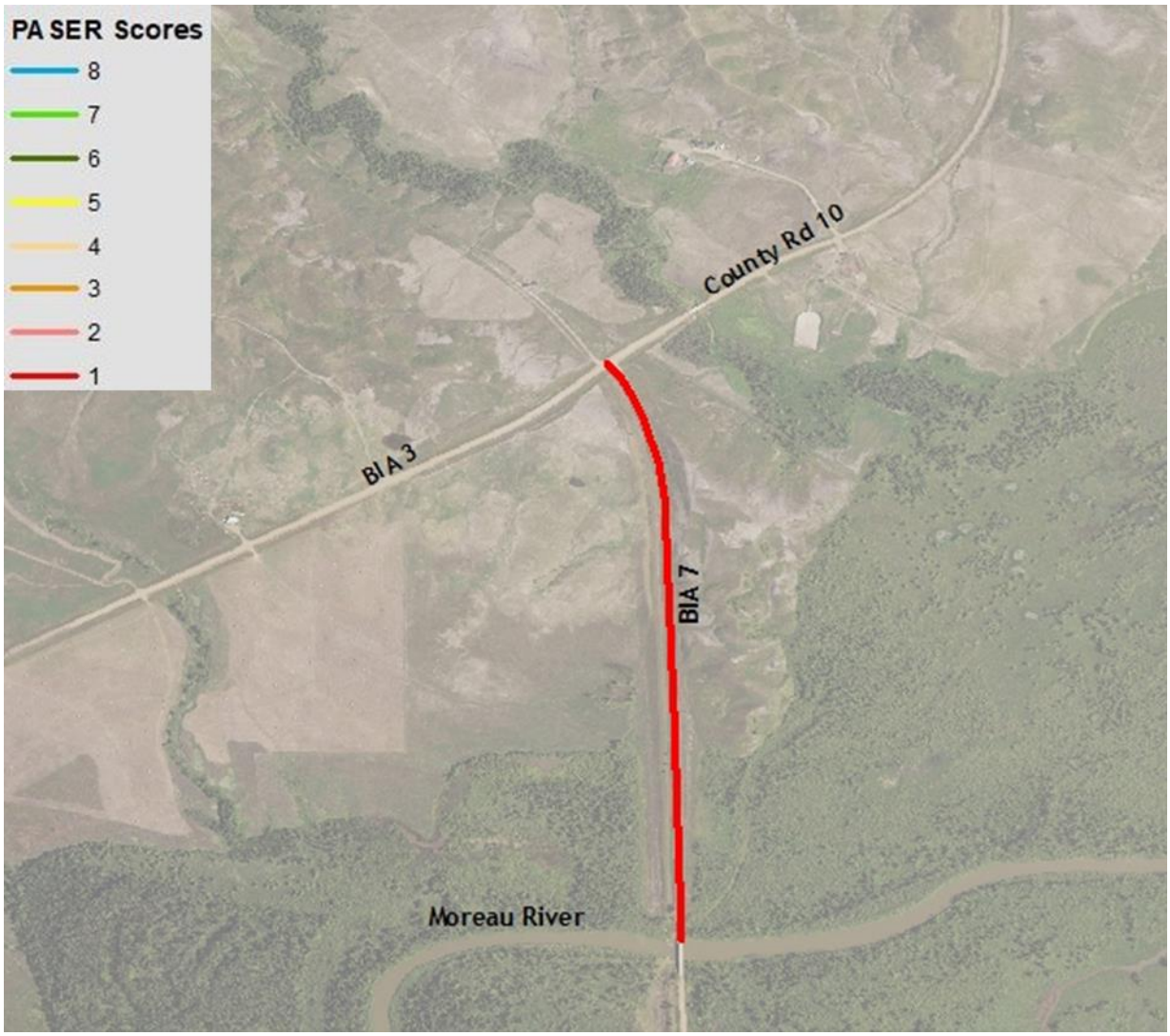


Figure 5-9 - PASER Rating - BIA Route 2200 - Bear Creek

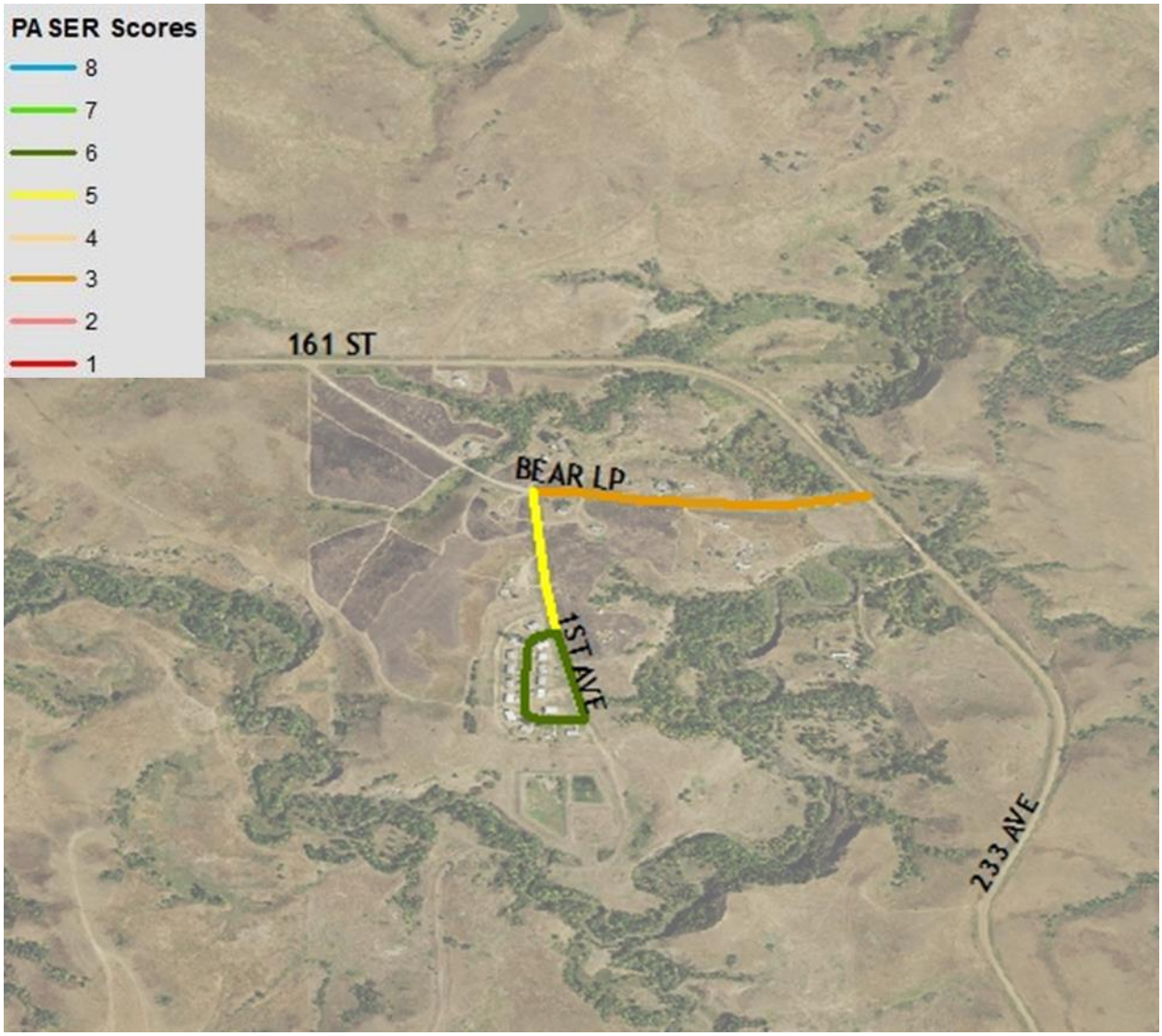


Figure 5-10 – PASER Rating – BIA Route 1000 – Dupree

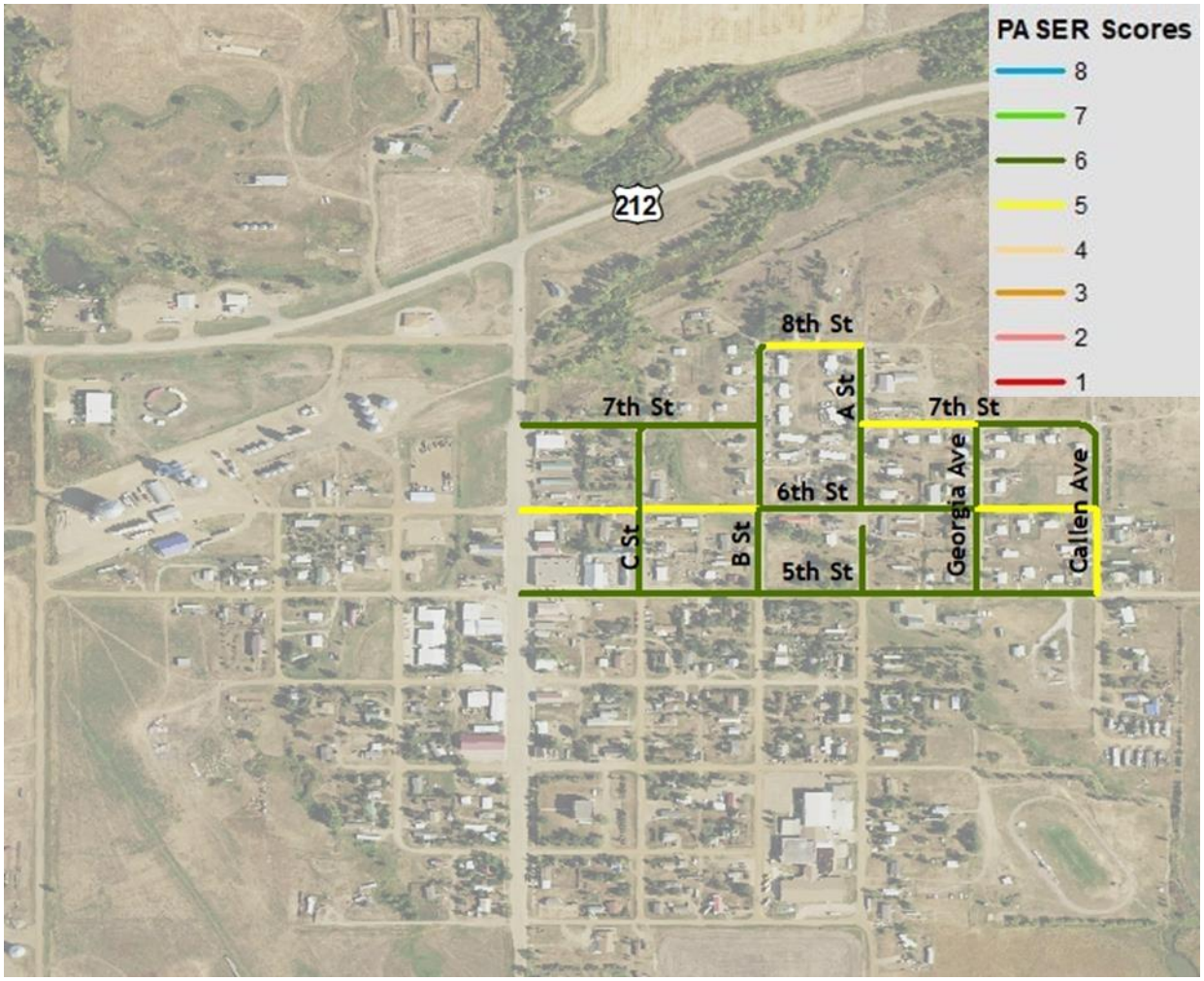


Figure 5-11 – PASER Rating – BIA Route 900 – Eagle Butte

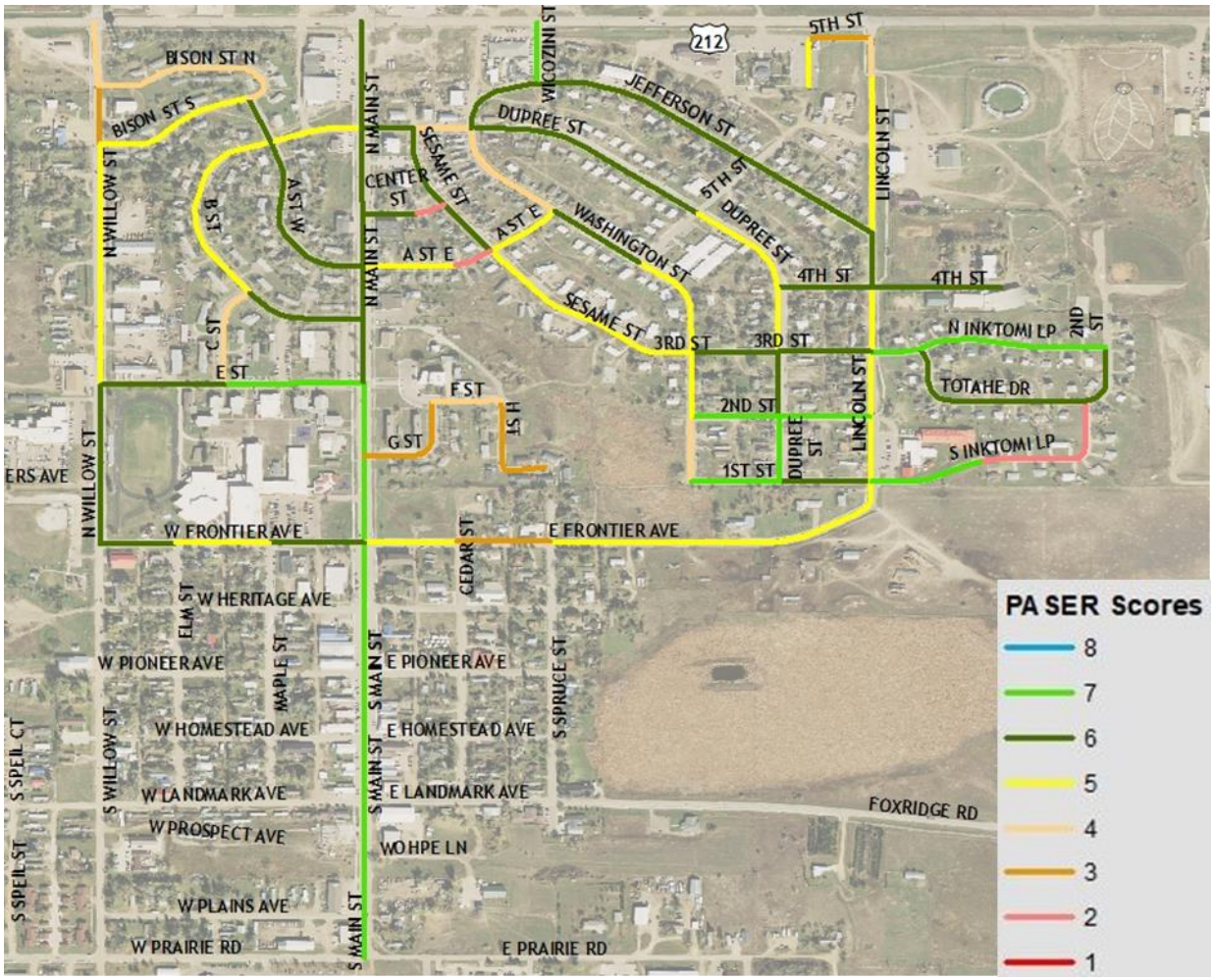


Figure 5-12 – PASER Rating – BIA Route 2800 – No Heart Housing

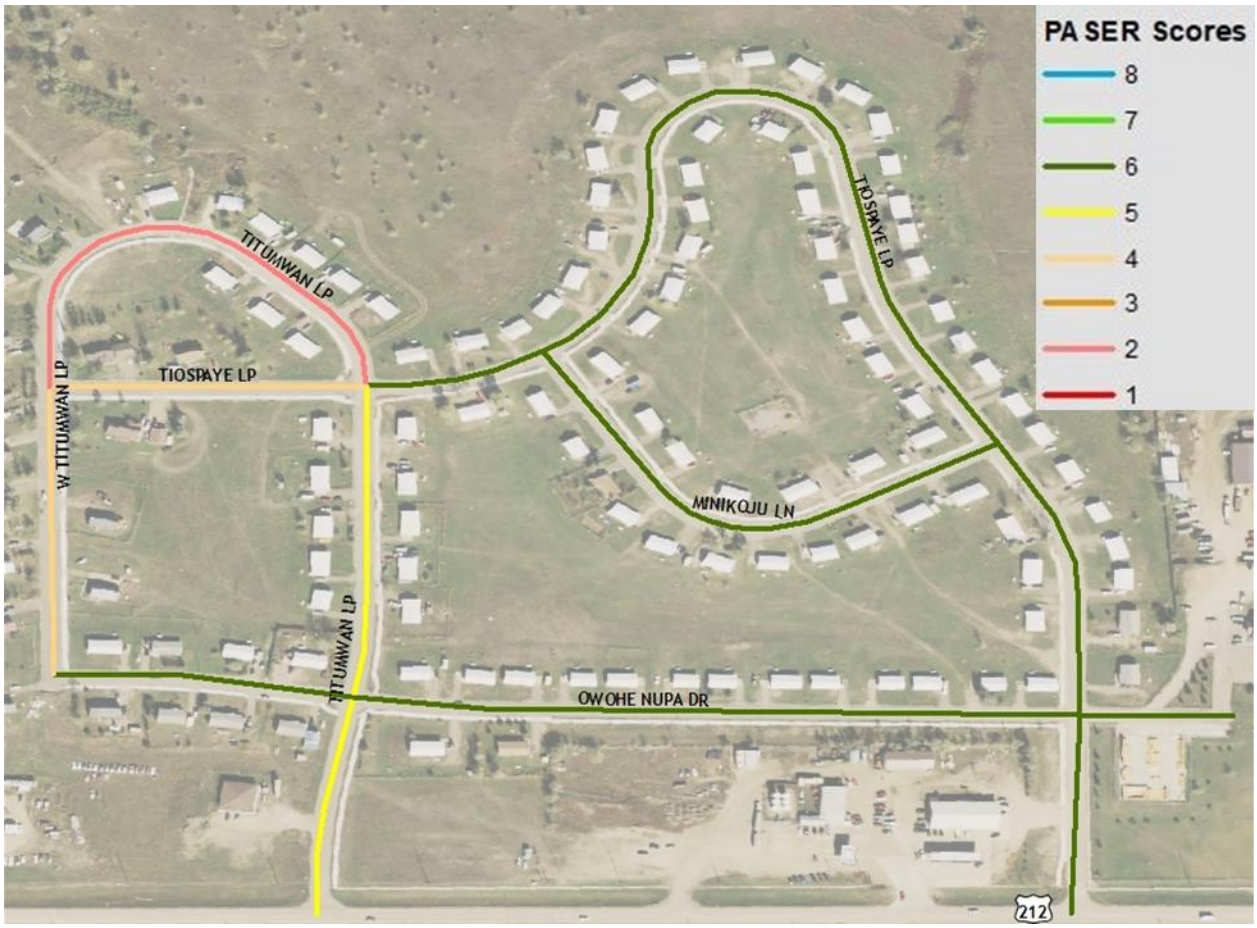


Figure 5-13 – PASER Rating – BIA Route 1600 – Habitat for Humanity Housing & BIA Route 1700 – Fox Ridge Housing

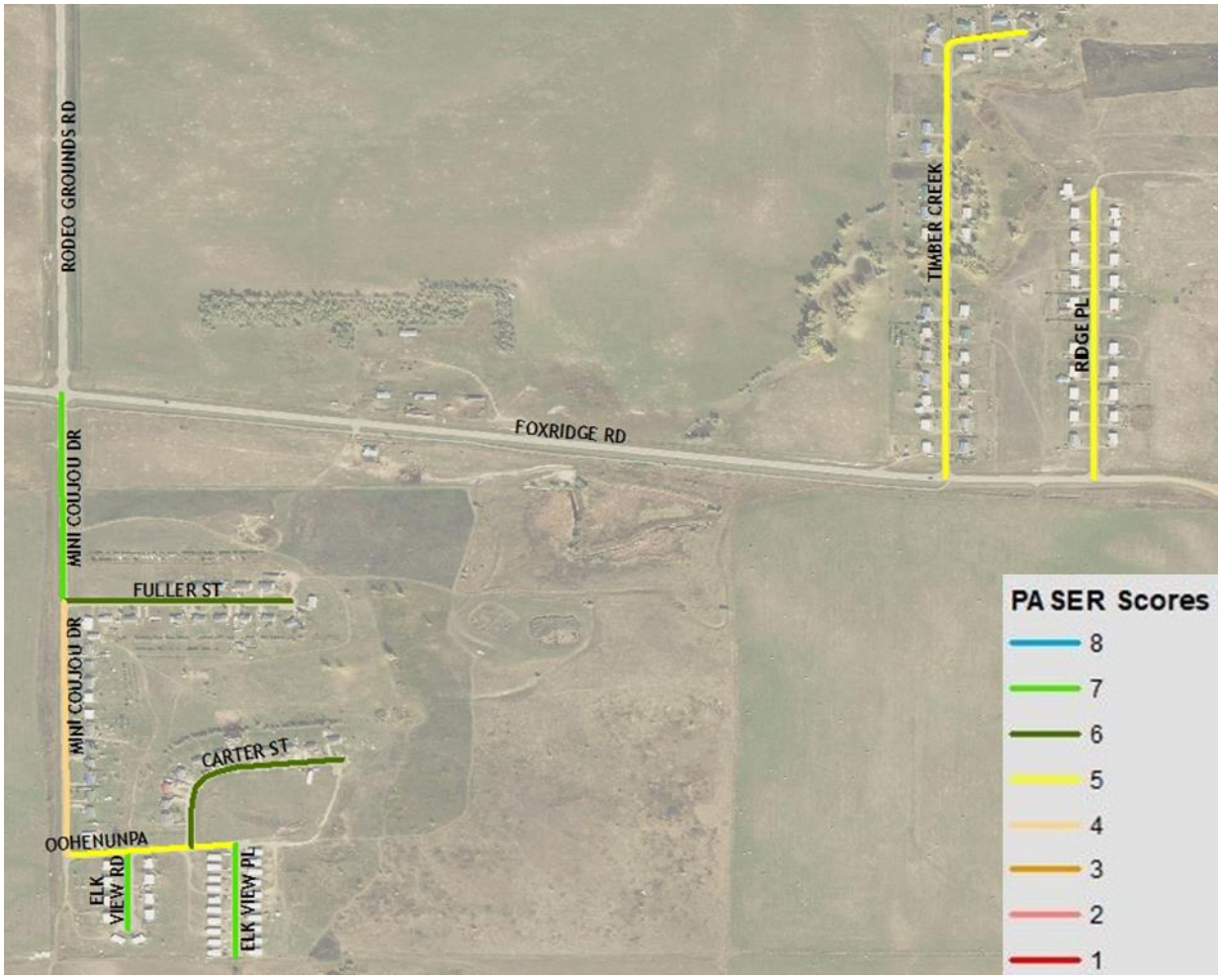


Figure 5-14 – PASER Rating – Indian Health Services Campus Streets

Figure 5-15 – PASER Rating – BIA Route 1200 – Green Grass Housing

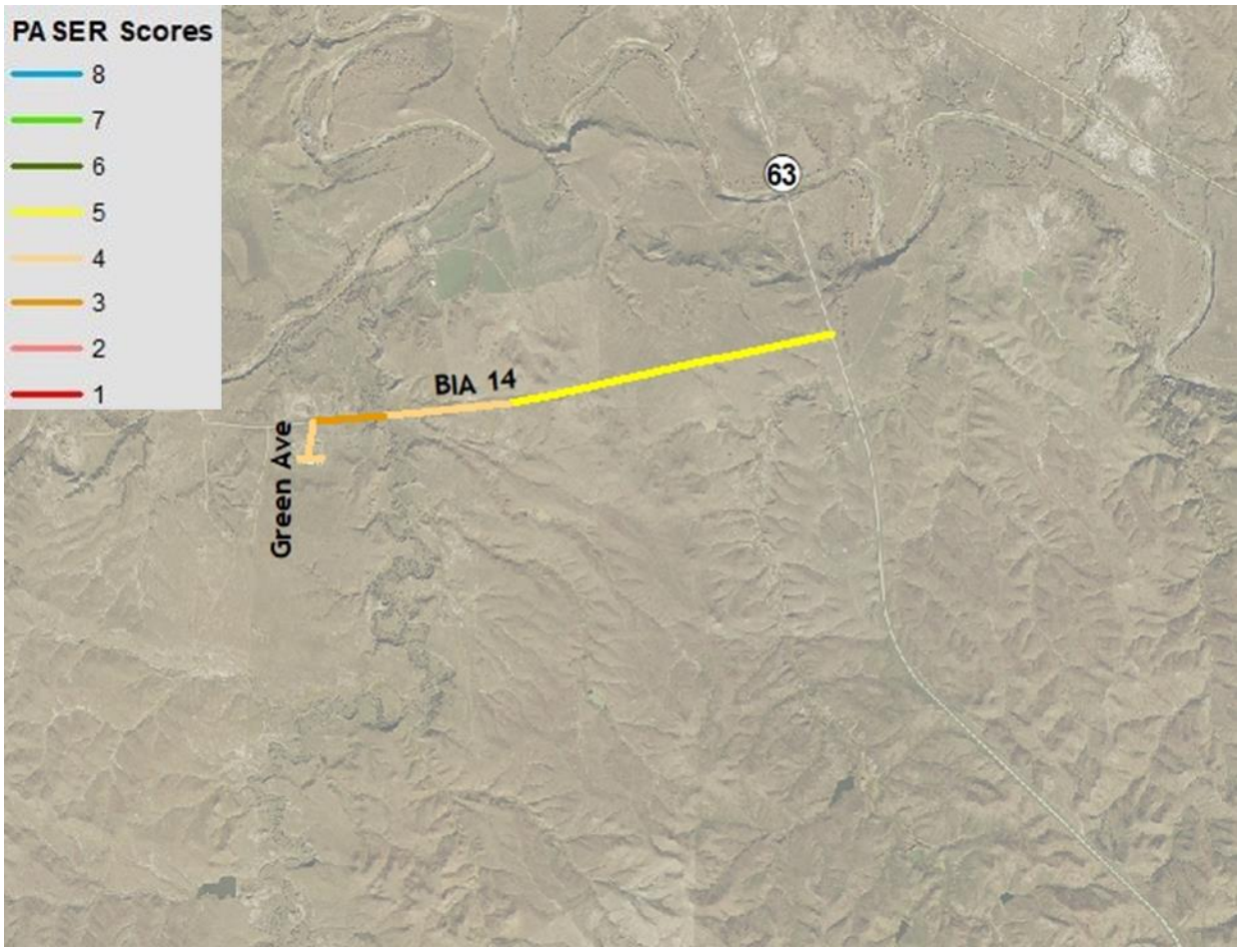


Figure 5-16 - PASER Rating - BIA Route 2600 - Iron Lightning Housing

Figure 5-17 – PASER Rating – BIA Route 2300 – LaPlant Housing

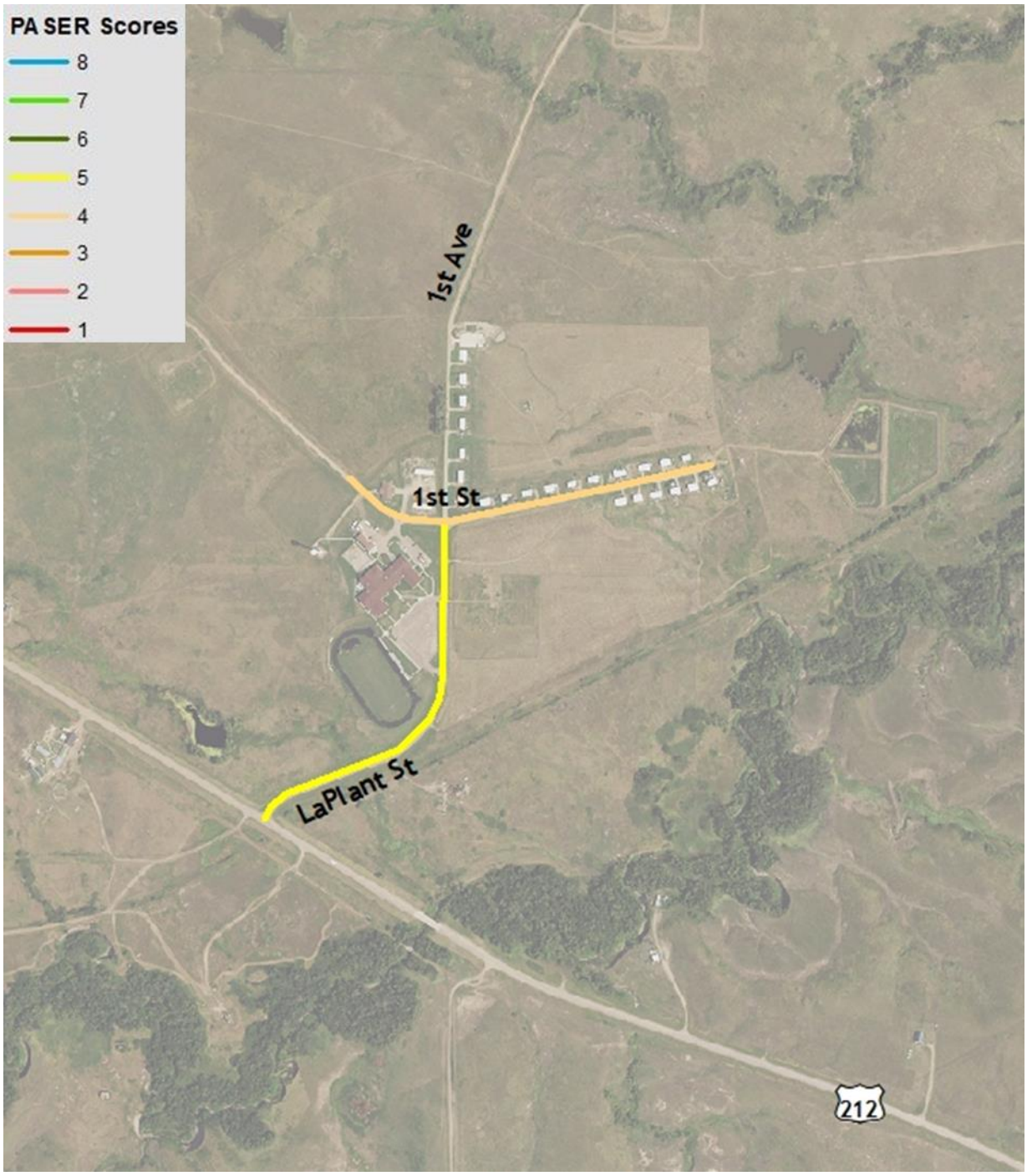


Figure 5-18 – PASER Rating – BIA Route 2700 – Swiftbird Housing

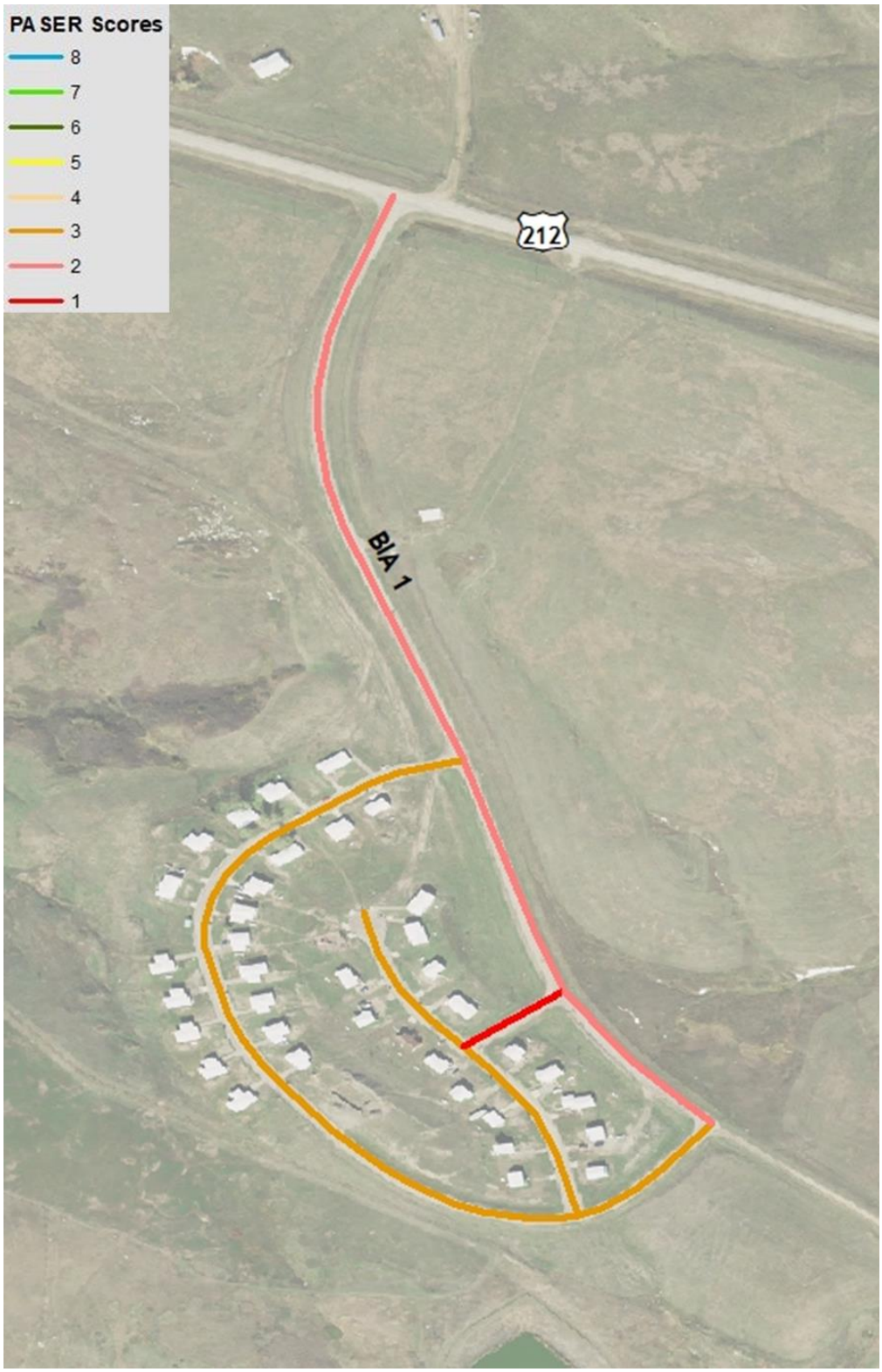


Figure 5-19 – PASER Rating – BIA Route 7070 – Takini School

Figure 5-20 - PASER Rating - BIA Route 2100 - Thunder Butte

Figure 5-21 – PASER Rating – BIA Route 2900 – Timber Lake

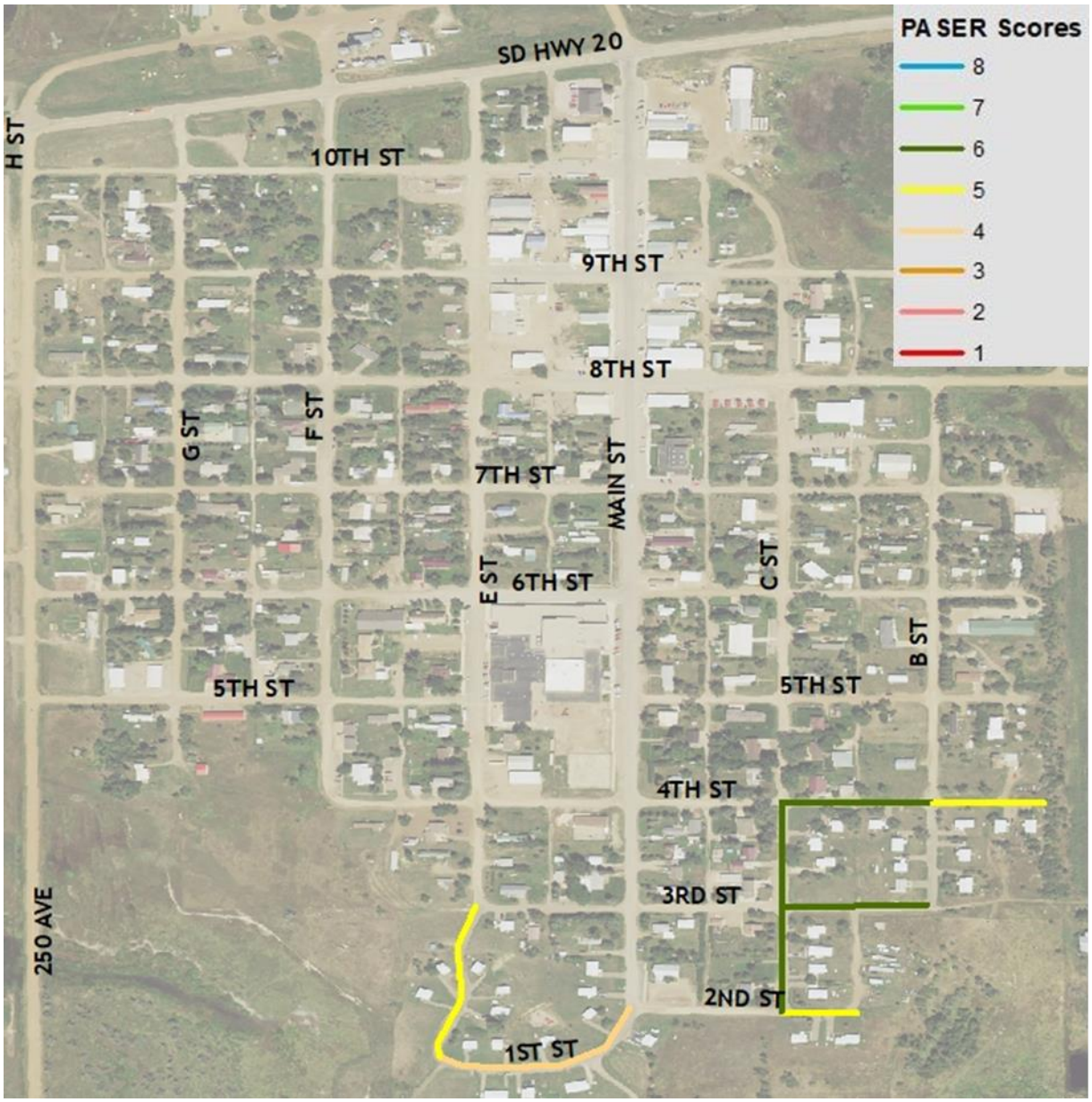
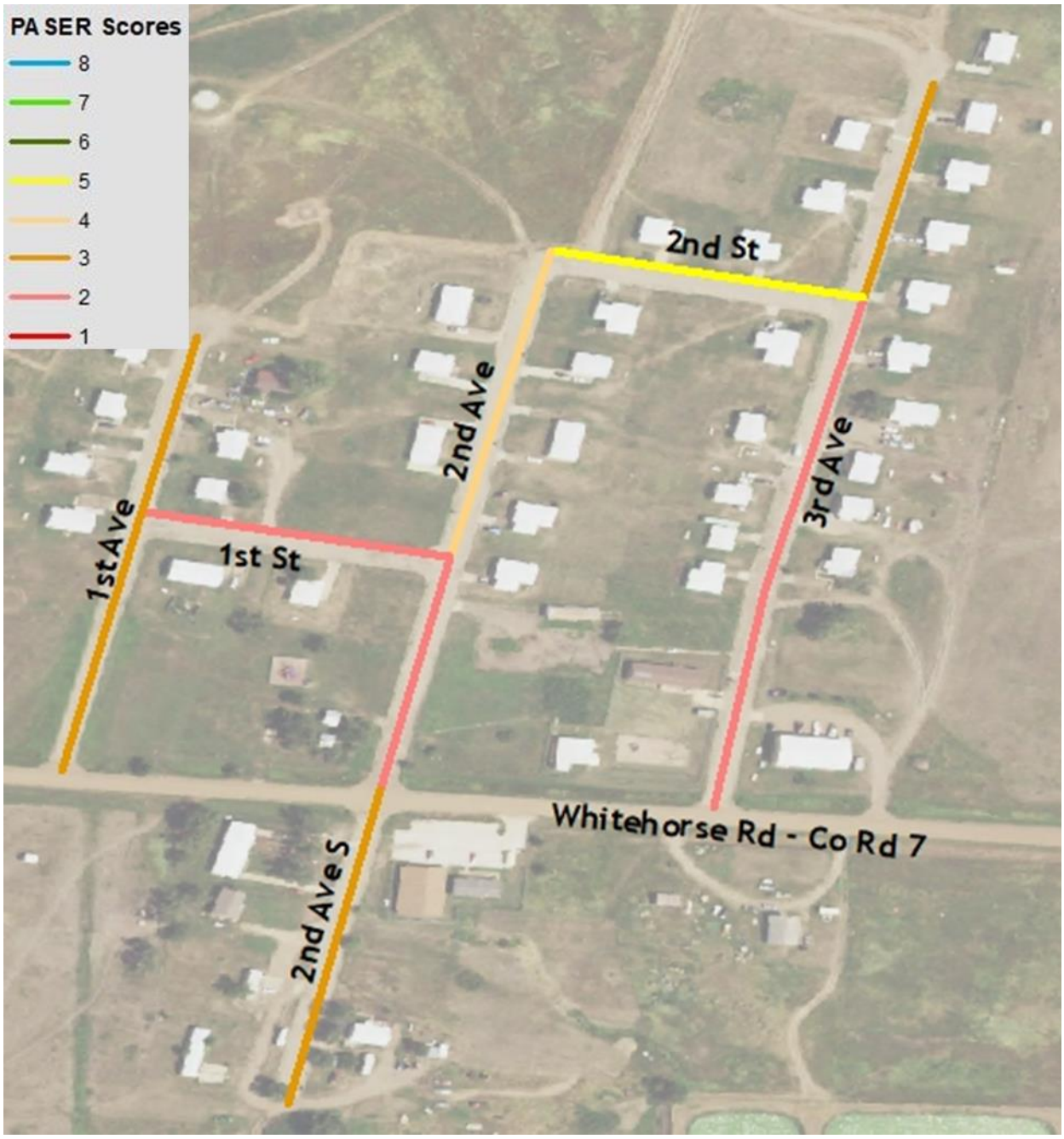


Figure 5-22 – PASER Rating – BIA Route 1400 - Whitehorse



RECOMMENDATIONS

This section focuses on the strategies and projects needed to maintain and improve the existing paved roads for which the CRST is responsible. The primary source for information in this chapter came from the FHWA's Pavement Preservation Compendium, Strategic Planning for Pavement Preventive Maintenance, documenting the Michigan Department of Transportation's "Mix of Fixes" Program.

The following pavement improvement strategies are recommended:

- Prioritize Maintenance over New Construction and Reconstruction
- Establish a Pavement Management Program (PMP)
    - Develop a Schedule for Pavement Preservation and Maintenance
- Undertake Committed Short Range Paving Projects
- Undertake Pavement Maintenance Projects
- Undertake Long Range Paving Projects

Prioritize Maintenance over New Construction and Reconstruction

While a newly constructed paved roadway is desirable and provides excellent rideability, the cost, approximately $2,000,000.00 per mile, is predominantly prohibitive. Reconstructing a road is also very costly and out of reach for most Tribes, particularly those with a large land base since the formula used to determine federal funding is currently based on population rather than road miles.

Having a proactive maintenance strategy in place for paved BIA and Tribal roads will maximize design life and help prevent the necessity of higher cost reconstruction versus more moderately priced repairs.

Costs for maintenance and new construction may vary within CRST borders. Approximate contracted out costs for major maintenance tasks on the Reservation are listed in Figure 5-23. It is very important for future planning to keep track of all maintenance costs (crack sealing, seal coats, etc.), no matter how minor the task. Tracking costs allows for an accurate pavement management plan throughout the Reservation and will enable more accurate programming, scheduling, and budgeting.

Figure 5-23 – Average Costs of Improvements

Improvement Type	Cost per Mile*
Complete Reconstruction	$1,700,000.00
Reconstruction	$1,500,000.00
Structural Overlay w/digouts	$600,000.00
Structural Overlay	$500,000.00
Non-Structural Overlay	$300,000.00
Crack and Chip Seal	$45,000.00
Chip Seal	$32,500.00
Crack Seal	$17,500.00

*Costs include TERO fees, engineering design and construction observation. Crack seals should be performed before chip seals and non-structural overlays.

Required rehabilitation based on PASER scoring is shown in Figure 5-24.

Figure 5-24 – PASER Scores and Required Rehabilitation

PASER Score	Rehabilitation Required
1	Complete Reconstruction
2	Reconstruction
3	Structural Overlay w/digouts
4	Structural Overlay
5	Non-structural Overlay
6	Crack and Chip Seal
7	Crack Seal
8	No Action Needed
9	No Action Needed
10	No Action Needed

Establish a PMP

Pavement management is the methodical planning and repair of paved roadways in order to optimize pavement conditions over the entire transportation system. A good PMP includes a periodic evaluation of highway pavements. On a paved highway system, conditions are evaluated and typically rated on metrics like distress, ride quality, friction, and rutting.

One method of accomplishing the type of evaluation necessary to establish a good PMP is a

Pavement Surface Evaluation and Rating (PASER). This provides detailed data that can be used to determine an ideal strategy to keep the pavement system on the Reservation in good condition. A PASER evaluation of paved roads on the Reservation was conducted in December 2019 and the results are discussed under the Existing Conditions heading of this section. It is recommended that another PASER evaluation be conducted in 2024 so that the data is available for an updated LRTP in 2025 as recommended by 25 CFR Part 70.

In conducting the evaluation, it is not simply looking at the lower scoring roads and saying that they are in the worst conditions and therefore have the most need. Other factors such as traffic volume, truck traffic, roadway safety, maintenance history, level of service needed, connections, and other elements should be considered to prioritize projects for implementation

Once a PMP has been created, the next step is to establish a schedule for pavement preservation and maintenance. Pavement preservation is performed to keep the transportation system facilities in good condition. Common asphalt pavement preservation efforts include crack sealing, chip seal coats, and non-structural overlays.

A pavement preservation program is designed to provide the public with safe, smooth, and well-maintained roads by applying cost-effective treatments to correct minor pavement deficiencies before the problems become major. This is a departure from the more traditional practice of reactive maintenance and expensive reconstruction. Prioritizing pavement preservation over reconstruction saves money in the long-term.

Asphalt pavements with a moderate stress load will generally have a 20-year life cycle. Using this life cycle duration, asphalt overlays would ideally be completed every 15 years to minimize pavement deterioration that would require costly reconstruction to rehabilitate. However, on local Reservation roads where truck travel is uncommon, useful pavement life may extend beyond 20 years if maintained with timely crack filling and seal coats.

A suggested schedule has been created as shown in Figure 5-25 that covers all BIA and Tribal asphalt paved roads using a 20-year life cycle.

FIGURE 5-25 - 20 Year Pavement Preservation Plan

Cheyenne River DOT 20 Year Pavement Preservation Plan			
Year	**Miles Crack Sealing**	**Miles Seal Coat**	**Miles Nonstructural Overlay**
2020-2024	30.0	30.0	15.0
2025-2029	30.0	30.0	15.0
2030-2034	30.0	30.0*	15.0
2034-2039	30.0	30.0**	15.0

*Complete approximately 7 years after seal coats performed in 2020-2024

**Complete approximately 7 years after seal coats performed in 2030-2034

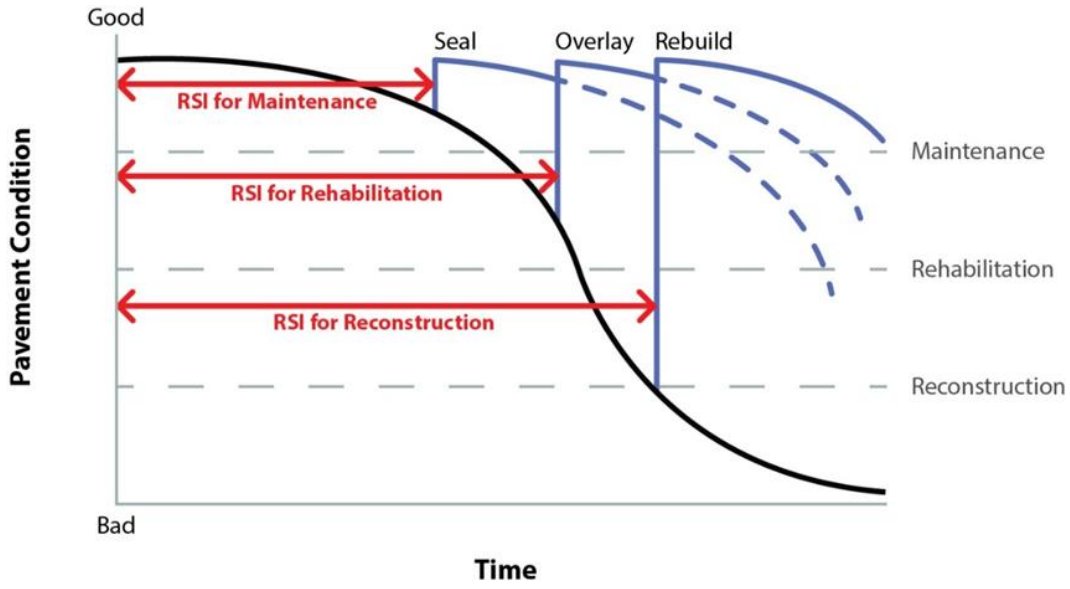
This schedule allows for crack sealing of all 60 miles every 10 years, seal coats every 7 years, and a nonstructural overlay every 20 years. (This figure includes 1.3 miles of BIA- and Tribally owned concrete roads located in the communities of Bear Creek, La Plant, Eagle Butte, Green Grass, Red Scaffold, and Bridger. These roads should also be evaluated and prioritized for maintenance and repairs to assure safe and comfortable residential streets.)

The expected design life of transportation facilities is estimated as follows:

- Bridges and concrete culverts: 50-100 years
- Asphalt pavements and bike paths: 20 years
- Gravel roadways: 3 to 7 years (prior to re-graveling)
- Signs: 10 years
- Pavement markings: 1 to 3 years for paint

Preventive maintenance can extend pavement life by using short-term treatments. Benefits can be maximized by applying treatments to roads while they are still predominantly in good condition. Figure 5-26 represents longer asphalt life over time when preventative measures are utilized appropriately. (RSI = Remaining Service Interval)

FIGURE 5-26 – Life-extending Benefit of Preventative Maintenance



Undertake Short Range Paving Projects

There are no short range paving projects in the Tribe's five year TTIP. However, if additional funding becomes available the Tribe may choose to move a long range project to short range or complete pavement maintenance projects.

Undertake Pavement Maintenance Projects

An established PMP and pavement preservation plan will assist the tribe in prioritizing pavement maintenance projects. As discussed previously, completing the less costly maintenance first will keep the roads that are already in good shape from deteriorating to the point of requiring more costly rehabilitation. Maintenance projects identified from the PASER study are shown in Figure 5-27. These projects are considered long range but should be completed earlier if funding becomes available; community streets should be prioritized over BIA highways. Refer to Figures 5-7 through 5-22 to identify specific housing streets or highway sections that fall within each project based on rehabilitation requirements.

Figure 5-27 – Pavement Maintenance Projects

CRST Long Range Pavement Preservation Projects				
Project	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
21	Pavement Preservation - Crack Seal	Community streets in Eagle Butte, Cheyenne River IHS Center, Habitat for Humanity housing, Thunder Butte	2.3 miles crack sealing	$55,170.00
22	Pavement Preservation - Crack and Chip Seal	Community streets in Bear Creek, Cherry Creek, Eagle Butte, Dupree, Fox Ridge Housing, Habitat for Humanity housing, Iron lightning, No Heart housing, Timber Lake	15.6 miles crack and chip sealing	$338,550.00
23	Pavement Preservation - Nonstructural Overlay -	Community streets in Bear Creek, Bridger, Cherry Creek, Dupree, Takini	1.9 miles nonstructural overlay	$567,150.00
24	Pavement Preservation - Nonstructural Overlay - East	Community streets in Eagle Butte, Green Grass, Habitat for Humanity housing, LaPlant, No Heart housing, Timber Lake, Whitehorse, one mile of BIA 14	5.2 miles nonstructural overlay	$1,564,320.00
25	Pavement Preservation - Structural Overlay -	Community streets in Bear Creek, Bridger, Cherry Creek	1.8 miles structural overlay	$921,500.00
26	Pavement Preservation - Structural Overlay - East	Community streets in Eagle Butte, Green Grass, Habitat for Humanity housing, LaPlant, No Heart housing, Timber Lake, Whitehorse, one mile of BIA 14	2.7 miles structural overlay	$1,366,380.00
27	Pavement Preservation - Structural Overlay	Community streets in Cherry Creek, Eagle Butte, Swiftbird, Whitehorse, one mile of BIA 14	2.7 miles structural overlay w/digouts	$1,512,130.00
28	Preservation - Partial Reconstruction	Community streets in Cherry Creek, Eagle Butte, Swiftbird, Takini, and Whitehorse	1.1 miles partial reconstruction	$1,711,650.00
29	Preservation - Full Reconstruction	Community streets in Swiftbird; BIA 7 north of the Moreau River bridge	1.8 miles full reconstruction	$3,514,070.00

In addition to community streets pavement preservation, there are two projects in the long range element of the LRTP. Long range projects are those which the Tribe has identified as transportation improvement needs and that they desire to have completed, but do not yet have available or anticipated funding required to achieve. Figure 5-28 is a list of paving projects to be completed as funding becomes available. Note that BIA 3 is a technically a pavement preservation project; however, it was designated as a long range project prior to the PASER study conducted in 2019 and is not included in the pavement preservation projects due in part to the significant cost estimate.

Figure 5-28- CRST Long Range Paving Projects

CRST Long Range Paving Projects				
Project #	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
17	BIA 3 Pavement Preservation	US212 to Moreau River, Dewey Co	Full and partial reconstruction	$13,170,000.00
38	County Rd 10 Reconstruction	North of BIA 3/BIA 7 junction, Dewey Co	Asphalt reconstruction, BUILD/TIGER grant application, funding coordination	$13,650,000.00
43	Eagle Butte Tribal Daycare New Road and Parking Lot	Eagle Butte, Dewey Co	New road and parking lot	$275,000.00
44	Touch the Clouds Subdivision New Community Streets	Eagle Butte, Dewey Co	Paved construction, 2 mi	$3,500,000.00

NON-PAVED ROADS

This section of the report examines the existing conditions of non-paved roads prevalent within the Reservation. Recommendations are provided at the end of this section.

EXISTING CONDITIONS

Most road miles on the Reservation are unpaved. There are 285 miles of earth and gravel roads on the Reservation that fall under the jurisdiction of the Tribe or BIA. County-owned roads account for approximately 800 more miles of earth and gravel roads throughout the Reservation; maintenance for these roads is the responsibility of the applicable jurisdiction.

Issues with non-paved roadways include narrowness, limited or no surface aggregate, poor cross section, lack of proper ditches and drainage, rutting, and dust. Failing or near-failing culverts have also caused road damage. These conditions were worsened on gravel roads throughout the Reservation after flooding in Spring 2019. Pictures of non-paved roadway surface conditions prevalent on the Cheyenne River Indian Reservation roads are shown in Figure 5-29.

FIGURE 5-29 – Non-Paved Roadway Types and Conditions

BIA 7 near Virgin Creek Bridge

BIA 2

BIA 5

Iron Lightning Streets

The CRST has a general Tribal maintenance budget of $575,000.00 allocated from annual TTP funds used to pay for non-paved roadway maintenance activities. Current maintenance practices include blading, adding gravel, mowing, and snow removal.

RECOMMENDATIONS

There are many resources available that provide guidance on good maintenance practices for gravel roads. This report referred to the *FHWA Gravel Roads Construction & Maintenance Guide* published August 2015, and the SD Local Transportation Assistance Program (LTAP) *Gravel Roads Maintenance and Design Manual* published November 2000. The following strategies are recommended:

- Provision of Suitable Roadway Materials and Surface Treatments
- Maintenance Programs
- Gravel Rehabilitation
- Undertake Committed Short Range Gravel Projects
- Undertake Gravel Maintenance Projects
- Undertake Long Range Gravel Projects

Surface and Base Materials

It is important to have a skilled grader operator to perform gravel maintenance and rehabilitation. However, problems with gravel road maintenance and rehabilitation often arise when poor quality gravel is used. Therefore, it is extremely important to use good quality gravel that is appropriate for each project. The CRST DOT will soon be losing one of its aggregate quarries and will need to replace this source.

It is recommended that the Tribe conduct a geological study to identify and develop a new aggregate source. Funding may be available through a Division of Energy and Mineral Development (DEMD) grant. With appropriate permitting through the South Dakota Department of Environment and Natural Resources (SD DENR), sand and gravel may also be mined from the Cheyenne River for short term projects. For more information, refer to South Dakota Codified Law 46 and Administrative Rule 74:02:01:03.

Surface treatments can be applied to reduce dust and to stabilize loose surface gravel. Magnesium chloride is a chemical effective in dust control, with a cost of about $8,000 per mile for the first treatment and $5,000 per mile for additional treatments. These treatments need to be applied once or twice a year, depending on conditions, to be effective. Dust control is typically only applied where road dust issues result in air quality issues adjacent to residences. The CRST should be cautious in using dust control as it could set a precedent for requests in many locations on the reservation and it can become an expensive element in their overall maintenance program.

Maintenance

Effective roadway maintenance techniques are outlined in the USDOT *Gravel Roads Maintenance and Design Manual*. Non-paved roadways will perform better if they are maintained with a 4 percent crown. Improper grading can remove valuable surface materials and grading must account for intersecting roads and driveways, as well as other site conditions. Training may be recommended for road grader operators to improve their ability to maintain various non-paved road surfaces and to respond to varying conditions.

The ability for roadway shoulders and ditches to keep the surface and subgrade free from water and ice is also important. Mowing operations should be included in the annual maintenance budget. Ditch inslopes should be mowed. This will also improve visibility, resulting in improved safety. Whenever possible, ditches should be provided to allow good drainage and provide additional snow storage.

The Tribe has been successful in reaching an agreement with Dewey and Ziebach counties wherein the county will provide maintenance, particularly snow removal, on Tribal roadways located in communities far from Tribal maintenance equipment. The Tribe in turn provides maintenance on some county roads. It is recommended to continue and even possibly increase the scope of this agreement to optimize time and equipment available to each jurisdiction.

Ditch and culvert improvements should be considered along roadways where drainage issues exist. The FHWA *Gravel Roads Construction & Maintenance Guide* reports that a survey of operators in the State of Iowa indicated mowing the shoulders on gravel roads ranked as one of four primary functions needed to maintain a good gravel road. Keeping proper shape, drainage, and straight cutting edges were the others.

Conversion of primitive roads to gravel roads is desirable wherever practical and as funding allows. Top priority should be given to roads with higher usage, followed by roads leading to cultural sites. Funding can also be set aside annually to upgrade equipment to bolster the gravel maintenance program.

Gravel Rehabilitation

Some existing gravel roads need significant effort to improve them to function as a quality gravel road. When the gravel surfacing needs to be removed and the subgrade needs to be improved, and changes to the ditch cross section are needed, a gravel rehabilitation project should be planned.

This type of work falls well beyond the typical gravel maintenance project and is therefore more expensive. However, without proper drainage and a good cross section, addition of gravel will do little to fix the problem. Gravel rehabilitation may also be used as an interim step towards future paving.

Before/after gravel rehabilitation. Image source: Ken Skorseth, Program Manager, SDLTAP; used with permission

Undertake Committed Short Range Gravel Projects

There are many gravel roadways within the Reservation that need maintenance or repair. Many road needs became urgent after flooding in Spring 2019. With limited funding, it is important to prioritize projects based on safety considerations and cost. Projects programmed in the Tribe's five year TTIP to be completed or started by the year 2024 are listed in Figure 5-30.

Figure 5-30 – CRST TTIP Gravel Projects

CRST - PROJECTS IN TTIP - FY 2021-2025						
Project #	**Project Name**	**FY2021**	**FY2022**	**FY2023**	**FY2024**	**FY2025**
5	BIA 3 Resurfacing					
6	BIA 8 Resurfacing - US 212 to Willow Creek	$942,000.00	$258,000.00			
7	BIA 12 - Resurfacing and Safety Upgrades		$2,455,398.70	$677,000.00	$1,600,000.00	$1,600,000.00
8	Multi Route Gravel 3 & 7					

Undertake Gravel Maintenance Projects

Most of the gravel projects identified by the Tribe to be performed in the long range element of the LRTP are resurfacing projects that fall under the umbrella of maintenance, although TTP construction funds may need to be used. These are listed in Figure 5-31.

Figure 5-31 – CRST Gravel Maintenance Projects

CRST Gravel Maintenance Projects				
Project #	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
7	BIA 7 Resurfacing	BIA 7, Dewey Co	Stabilized road base with double chip seal and blotter coat	$5,370,000.00
10	BIA 11 Takini West Resurfacing	Takini School to SD34	Stabilized road base with double chip seal and blotter coat	$2,100,000.00
11	BIA 11 Takini East Resurfacing	BIA 11, Takini School to Cherry Creek, Ziebach Co	Stabilized road base with double chip seal and blotter coat	$5,610,000.00
18	BIA 2 Resurfacing	BIA 2, Dewey County	Stabilized road base with double chip seal and blotter coat	$5,520,000.00
25	BIA 6 Resurfacing	BIA 6, Ziebach County	Stabilized road base with double chip seal and blotter coat	$9,600,000.00
26	BIA 13 Resurfacing	BIA 13, Ziebach County	Stabilized road base with double chip seal and blotter coat	$2,610,000.00
27	BIA 14 Resurfacing	BIA 14, Ziebach County	Stabilized road base with double chip seal and blotter coat	$1,410,000.00
28	County Rd 9015 Resurfacing	Between BIA 2 and Whitehorse, Dewey Co	Stabilized road base with double chip seal and blotter coat	$510,000.00
30	BIA 19 Resurfacing	BIA 19, Dewey Co	Stabilized road base with double chip seal and blotter coat	$1,560,000.00
31	BIA 8 Resurfacing	Between BIA 19 and Rte 8509, Dewey Co	Stabilized road base with double chip seal and blotter coat	$4,950,000.00
32	BIA 803 Resurfacing	BIA 803, Dewey Co	Gravel Resurfacing and Gravel Construction	$795,000.00
36	County Rd 55 Resurfacing	Eagle Butte, Ziebach Co	Stabilized road base with double chip seal and blotter coat	$420,000.00
37	County Rd 224 1/2	Dupree, Ziebach Co	Correct drainage issues	$10,000.00
38	County Rd 7810	West of Dupree, Ziebach Co	Stabilized road base with double chip seal and blotter coat	$150,000.00

There are three long range gravel projects as listed in Figure 5-32.

Figure 5-32 – CRST Long Range Gravel Projects

CRST Long Range Paving Projects				
Project #	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
10	Tribal Route 8509 Gravel Construction	S from BIA 8, Dewey Co	Upgrade earth road to gravel	$960,000.00
13	BIA 17 Proposed Road	LaPlant to Promise, Dewey Co	New gravel road construction	$1,176,000.00
31.1	New Tribal Housing Streets	Reservation wide	Gravel construction w/drainage, 1 mile	$200,000.00

ROADSIDE ELEMENTS

This section of the report provides a review of roadside elements which include traffic control, access conditions, on-street parking, snow fences, and street lighting, followed by recommendations.

EXISTING CONDITIONS

Traffic Control

Road traffic control devices are signs, markers, or signaling devices utilized to control the flow of traffic, including pedestrians, bicyclists, and motor vehicles. Common traffic control devices and their applications are discussed in the following paragraphs.

The following list outlines common traffic control methods from the FHWA's *Manual on Uniform Traffic Control Devices for Streets and Highways*, (MUTCD) 2009 Edition.

- Traffic Signals - The MUTCD traffic signal standards include warrants for varying data thresholds ranging from pedestrian and vehicular volumes to crash frequency. Based on a review of the highest traffic volumes within the Reservation, no unsignalized intersections meet traffic signal warrants.

- All-Way Stop Control - The MUTCD includes All-Way Stop Control (AWSC) warrants based upon traffic volumes, motorist delay and crash frequency. The AWSC signs increase delay on major approaches by forcing vehicles to stop on the primary streets regardless of whether a vehicle is present on the minor approaches. Studies have found AWSC sites with great disparities between major and minor approach volumes typically experience high levels of traffic control noncompliance.

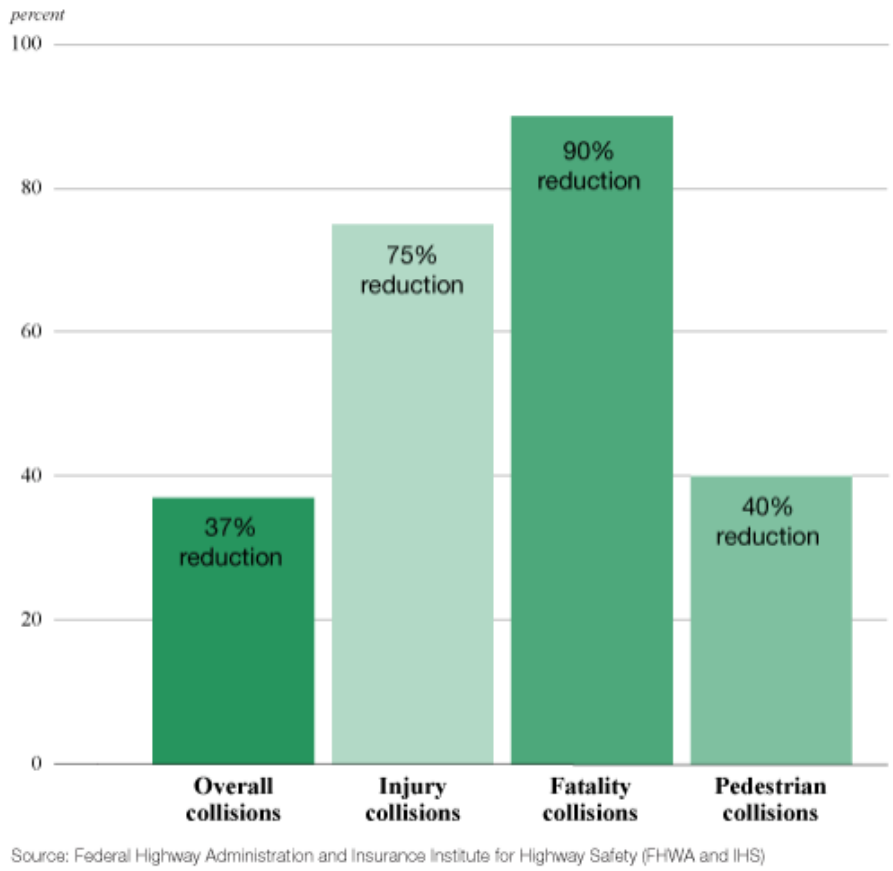
- Pedestrian Hybrid Beacons - A pedestrian hybrid beacon (PHB) is a type of beacon used to warn and control traffic at an unsignalized location to assist pedestrians in crossing a street or highway at a marked crosswalk. This type of beacon is activated by pedestrians when needed. MUTCD standards for this traffic control require consideration of vehicular traffic volumes, pedestrian crossing volumes and crosswalk lengths.

- Pedestrian Flashing Beacons - Flashing beacons may be used at pedestrian crosswalks to enhance pedestrian visibility and actuate vehicle stoppages.

- Two-Way Stop Control - The MUTCD guidance for Two-Way Stop Control (TWSC) installation is based upon either traffic volume thresholds, sight distance limitations, or crash frequency thresholds.

- Roundabouts - There are no roundabouts in the study area. The SDDOT currently does not allow construction of roundabouts on their road system. Roundabouts are a traffic control measure that offers potential traffic operational benefits when implemented at the proper location. Roundabouts also offer the following safety benefits:
  - Roundabouts have fewer vehicular conflict points in comparison to conventional intersections. The potential for high-severity conflicts, such as right angle and left turn head-on crashes, is greatly reduced with roundabout use.
  - Low speeds generally associated with roundabouts allow drivers more time to react to potential conflicts, also helping to improve the safety performance of roundabouts. Low vehicle speeds help reduce crash severity, making fatalities and serious injuries for vehicles and pedestrians uncommon at roundabouts.
  - Pedestrians cross only one direction of traffic at a time at each approach as they traverse roundabouts (i.e., crossing in two stages) as compared with the existing intersections, reducing exposure and delay by reducing vehicular gap requirements.
  - Roundabouts can reduce the number of crashes at an intersection in comparison to traffic signal use. The expected reductions are shown in Figure 5-33.

Figure 5-33 - Collisions Reduction with Roundabouts



Source: Federal Highway Administration and Insurance Institute for Highway Safety (FHWA and IHS)

Access Conditions

High levels of access exist along various highway and street segments within the Cheyenne River Indian Reservation. Studies have shown that this increases the potential for crashes. An example of a poor access condition is a skewed intersection, like the one shown here at the junction of BIA 6 and BIA 15.

On-Street Parking

Parking is an essential component of transportation systems and land development. Although many businesses and residents have off-street parking, some of them rely on abutting on-street parking.

A high volume of on-street parking maneuvers can impede through traffic movements if the roadway is blocked even partially by parked vehicles. These parking maneuvers also impact safety, particularly where diagonally parked cars back out into the through traffic stream.

On-street parking also reduces the space available for sidewalks, landscaping, and other amenities. This photo shows on-street parking on Main Street between Homestead Avenue and Landmark Avenue in Eagle Butte.

Snow Fences

There are many roads throughout the Reservation that are prone to closure after snow events. Strategically placed snow fences provide a method of controlling drifting snow across roadways. Determining the best places for snow fences can be achieved by taking GPS coordinates where the worst drifting occurs. The CRST is aware of several of these locations. A review of maintenance records may also provide the information needed to determine the most efficient placement.

According to MnDOT, the use of snow fences may result in the following benefits:

- Prevent large snow drifts and icy roads that can lead to stranded motorists.
- Improve driver visibility and reduce vehicle accidents.
- Save money by reducing plow time and heavy equipment use required to clear drifts; studies published by the National Research Council in 1991 showed that mechanical snow removal costs approximately 100 times more than containing snow with fences.
- Lessen environmental impact with less salt use, fewer truck trips, and less fuel consumption.

There are two types of snow fences, living and constructed; both are effective for controlling snow drifts and reducing the potential for unsafe travel conditions and road closures.

Living Snow Fences: The MnDOT has a program in place promoting living snow fences, which are trees, shrubs, native grasses, and wildflowers located along roadways. In addition to the benefits listed above, living snow fences also provide the following benefits:

- Control soil erosion and reduce spring flooding by keeping soil sediment out of the ditches to maintain proper drainage.
- Depending on the type of living snow fence, grassland nesting bird and pollinator habitats are improved.
- Research shows that standing corn rows facilitated as snow fences reduced the severity of injuries on curves by 40%.

Living snow fences may take several years to establish, and this can be a deterrent to implementation. However, a 2014 study published by the State University of New York College of Environmental Science and Forestry showed that living snow fences have the potential to exceed snow drifting on roads in as little as three years.

The cost of constructed a living snow fence is contingent on the type of vegetation used. MnDOT research shows that native willows cost about $3.60 per plant to raise, furnish, and plant versus about $50.50 per plant for more traditional snow fence species.

Constructed Snow Fences: According to Rex Lockman with the Laramie County Conservation District in Wyoming, slatted wood and plastic are the most commonly used materials to construct snow fences. Fiberglass is also a material used to construct snow fences. While wood, is typically the preferred material for aesthetic reasons, it is more expensive and requires more maintenance than plastic or fiberglass. This photo shows wood snow fences placed along I90 near Gillette, Wyoming.

Constructed snow fences are usually four to eight feet high with 50% porosity, meaning half of the fence's broad area is open space.

To be efficient, the snow fence must be parallel to the road and perpendicular to the prevailing wind direction to the extent allowed by terrain. The bottom 10% to 15% should be left open so that snow does not settle directly under the fence, which would reduce its effective height. The Iowa DOT recommends a setback distance of H x 35 for constructed snow fences. For example, an eight-foot high fence would be set back 240 feet from the edge of the roadway.

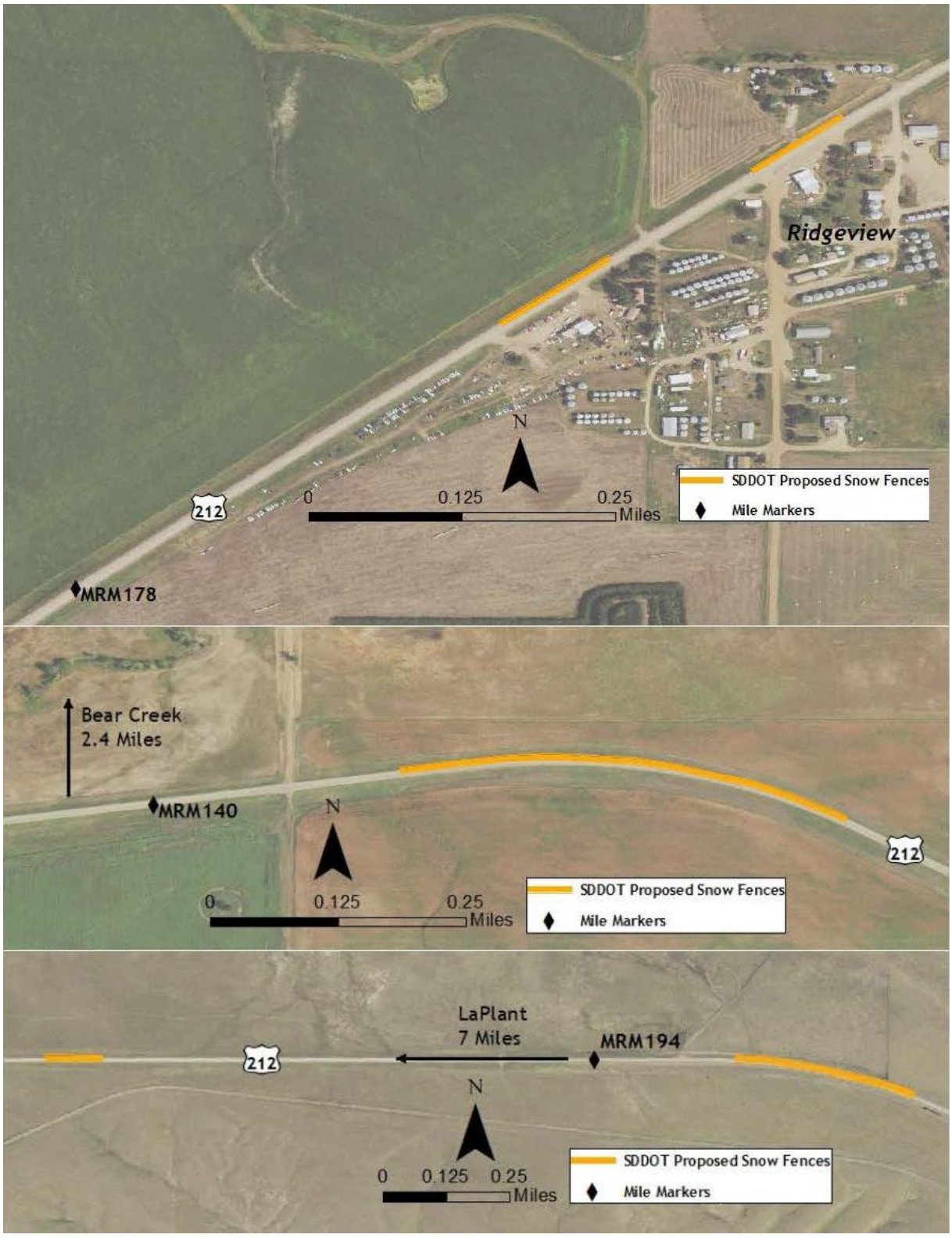
A variation of the traditional snow fence is a 4' lath fence, which consists of four metal stakes that support a 16' preassembled panel. This type of fence can be installed and maintained using less resources than other types of snow fences.

The cost of construction and installation of an 8' wood A-frame snow fence is about $17* - $23* per linear foot based on SDDOT bid prices. The 4' lath fence costs about $2.40* per linear foot according to a study conducted by the New Mexico Institute of Mining and Technology about snow barrier effectiveness. Five rows of 4' lath fences are required to achieve the effectiveness of one 8' wood fence; the total cost per linear foot at $12 is still significantly lower than the 8' fence. The type of snow fencing currently used by the Tribe is temporary fencing consisting of perforated orange polyethylene attached to metal stakes.

*Prices includes 20% contingency fee.

The Mobridge area SDDOT has identified problem areas on US Hwy 212 and are in the process of identifying areas on SD 63, SD 65, and SD 20 that would benefit from the placement of snow fences. While not having any snow fencing projects in the current STIP, they are drafting an agreement policy between the SDDOT and landowners that would allow for snow fencing. Areas identified on US Hwy 212 are shown in Figure 5-34.

Figure 5-34 – SDDOT Proposed Snow Fences on US Hwy 212



Street Lighting

A formal review of existing lighting was not undertaken as part of the LRTP. However, there is a need for improved lighting in towns and subdivisions, at busy intersections, and along existing and future sidewalks and shared use paths in areas throughout the Reservation.

RECOMMENDATIONS

Traffic Control

A formal engineering study of traffic control conditions was not conducted as part of the LRTP. The following recommendations are based on traffic and crash data obtained from the SDDOT website, observations made during the LRTP process, and information from CRST's TTSP written in 2015.

- Pedestrian Flashing Beacons – This type of beacon is popularly requested due to the belief that it will motivate vehicle drivers to slow down. Due to construction, maintenance, and operating costs, installation of this control should only be completed after a traffic study has been conducted.

- There are currently no roundabouts in the study area. Roundabouts may be a good alternative along busy State and US highways within the Reservation. However, until the SDDOT determines to pursue them again in South Dakota, it is unlikely that other locations within the Reservation will warrant this traffic control improvement due to the high cost of the facility.

Access Conditions

When possible, efforts should be taken to reduce access in locations where it is excessive. The planning phase of a new road project is the best time to consider how access can efficiently and safely be provided. New development plans should also be carefully reviewed to determine whether planned access will interfere with safety or mobility along an adjacent highway.

Where undesirable access conditions exist, access management strategies should be implemented. Access management is a set of techniques used to control access on streets and highways. It is typically focused on functionally classified collector and arterial roads.

Access management techniques generally reduce the number of accesses or increase the spacing between accesses onto major thoroughfares. They can also include aligning offset intersections. Better access for hunting, fishing, tourism, and development would be beneficial in many locations throughout the Reservation.

On-street Parking

Provision of on-street parking within the Reservation should be evaluated on a case by case basis. On-street parking is expensive to build and maintain. It increases the width of a street, potentially reducing the safety for pedestrian crossings, and reduces space that could be used for sidewalks, landscaping, and other amenities. Wherever existing on-street parking is underutilized, consideration should be given to phasing it out over time.

Snow Fences

Since effective placement of snow fencing is typically out of the right of way, landowner cooperation is the first step in most snow fence installation. It is recommended that the Tribe follow a process currently being drafted by the SDDOT. It consists of the following steps:

1. Identify locations of need
2. Identify landowners and obtain contact information
3. Confirm the landowners' willingness to allow snow fences on their property
4. Obtain a signed agreement with the landowner
5. Prepare plans and let the project

Analysis should be conducted to determine the most strategic placement of snow fences. It is recommended that the Tribe set aside a portion of annual maintenance funding to start installing sections of snow fences based on prioritized need.

The CRST would benefit from planting living snow fences now so that they are functional within a few years. A study of successful snow fences in the Plains region would assist the Tribe in determining the best vegetation to use on the Reservation. The Tribe may also want to consider adopting a program like one in place at MnDOT in which farmers are financially compensated to leave standing corn rows alongside roadways until the following spring. Compensation is based on number of rows and set back distance from roads. This option is also being considered by the Mobridge area SDDOT for snow fencing along state routes through the Reservation.

To address the urgent need for snow fences it is recommended to use constructed fences until living snow fences are efficiently abating snow drifting. To help minimize costs, it is recommended that the CRST DOT coordinate with the local TERO representative to see if program participants are available to construct and place the fences.

Street Lighting

It is recommended that the CRST conduct a study to map existing lighting locations and conditions to identify the types and locations for street lighting needed throughout the Reservation, and to prioritize and schedule street lighting projects for implementation as funding becomes available.

FREIGHT AND TRUCKING

Freight is defined as goods transported by truck, train, ship, or aircraft. The efficient movement of goods is a central element for growth in jobs and a strong economy, both of which are important to the Tribe. This section provides an analysis of existing conditions followed by recommendations to mitigate impacts.

EXISTING CONDITIONS

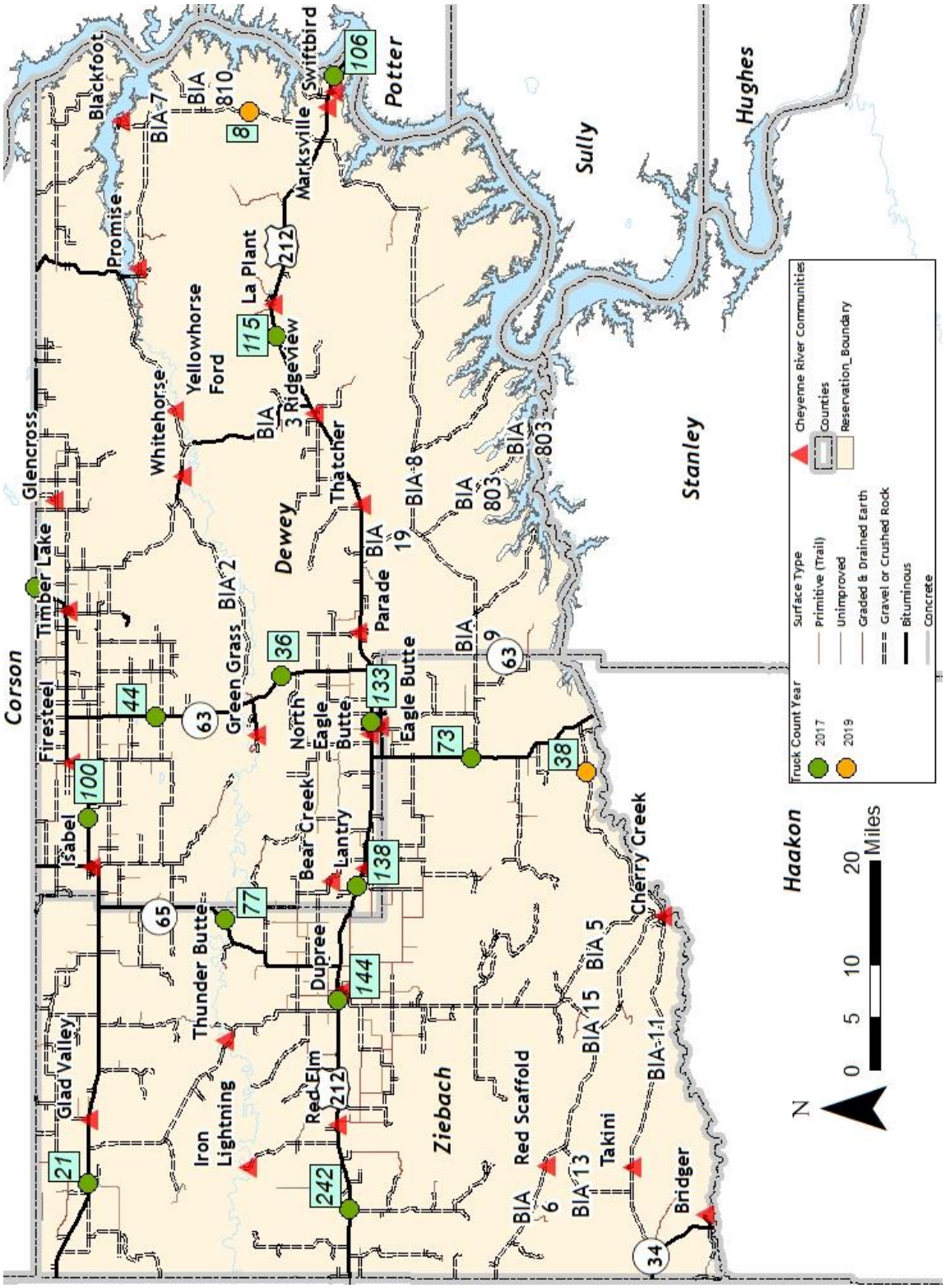
Most freight and trucking occur on the US and State highways within the Reservation. Heavy loads carried by trucks cause much greater damage to roads than passenger vehicles, and the heavier the load, the more the damage increases exponentially. Heavy loads exacerbate rutting and accelerate fatigue cracking, which can lead to potholes, and cause corrugation (washboarding) on gravel roads.

Concerns have been raised regarding trucks exceeding the load limits throughout the Reservation. There are some gravel routes that have been damaged to the degree that truck transportation is not safe. For example, the Tribe must drive to Faith to pick up milk for Takini School; the condition of the roads leading to the school have become damaged to the point that the previous truck driver no longer delivers on these routes.

The hauling of hazardous wastes is also a potential concern of trucking on the Reservation. If spilling of hazardous waste were to occur on the Reservation, the closest spill remediator according to the SDDENR is in Pierre, South Dakota.

Truck traffic data on the Reservation is limited to the South Dakota State Highway system recorded in 2017, supplemented by two counts on BIA roads taken during the LRTP process in 2019. The map in Figure 5-35 shows truck traffic counts on the Reservation.

Figure 5-35 – Truck Traffic Counts



Road damage caused by heavy trucking can be minimized if load limits are established and enforced. Portable scales can be used to monitor travel by trucks exceeding the load limits and assist in levying fines. It would be beneficial for the CRST to consider development of ordinances, policies, and procedures aimed to reduce the activity of excessively loaded trucks on Reservation roads; inclusion in the Tribal code would be necessary for enforcement.

Future policies could include requiring hauling permits and levying fines for all overweight vehicles that use BIA and Tribal roads. Ideally, contractors and major businesses would be held responsible for damage to any haul roads on the Reservation.

Emergency planning on State, County, or Tribal level should address the potential for hazardous spills and their impacts on access and safety. Planning should also propose possible responses to potential spills.

BRIDGES AND CULVERTS

Bridges and culverts are important transportation facilities that often get overlooked until disaster strikes. Bridges provide easier transportation routes that save time by reducing distances between destinations. Culverts allow water to flow in its natural course under roadways, preventing flooding, erosion, and road damage. This section examines current bridge and culvert conditions on the Reservation followed by recommendations for improvements.

EXISTING CONDITIONS

Bridges

The National Bridge Inventory (NBI) lists 41 bridges located on the Reservation, with 21 BIA-owned bridges according to the 2018 NTTFI report. The remaining bridges fall under the jurisdiction of County or State. Figure 5-36 shows the locations of bridges and culverts on the Reservation, with the BIA-owned bridges identified by bridge number and name. This map shows only the culverts listed in the NBI; there are many unlisted culverts present on the Reservation. The culvert codes listed on the map are described in more detail later in this chapter. An 11x17 map is available in Appendix B.

Bridge inspections were conducted by the Midwest regional office of the BIA or its consultants on BIA and Tribally owned bridges in 2017. A review of the inspection reports revealed that many of the bridges on the Reservation have multiple deficiencies that need to be addressed. A non-inclusive list of deficiencies in shown in Figure 5-37.

The results of inspection reports from 2017 are summarized in Figure 5-38. The NBI sufficiency rating determines eligibility for funding. Historically, federal funds have been available for bridge projects based on the following criteria:

- Bridges with sufficiency ratings 76-100 do not qualify for funding.
- Bridges with sufficiency ratings between 51-75 qualify for rehabilitation funds.
- Bridges with sufficiency ratings below 50 qualify for replacement funds.

Based on 2017 bridge inspection reports, there are currently three bridges on the Reservation that qualify for federal funding. Since bridge inspections should be conducted every two years, this figure may change after 2019 inspection reports are available. New legislation has allowed for possible funding of bridges with sufficiency ratings very close to the ratings listed above, contingent on justification and data support.

Figure 5-36 – CRST Bridges and Culverts

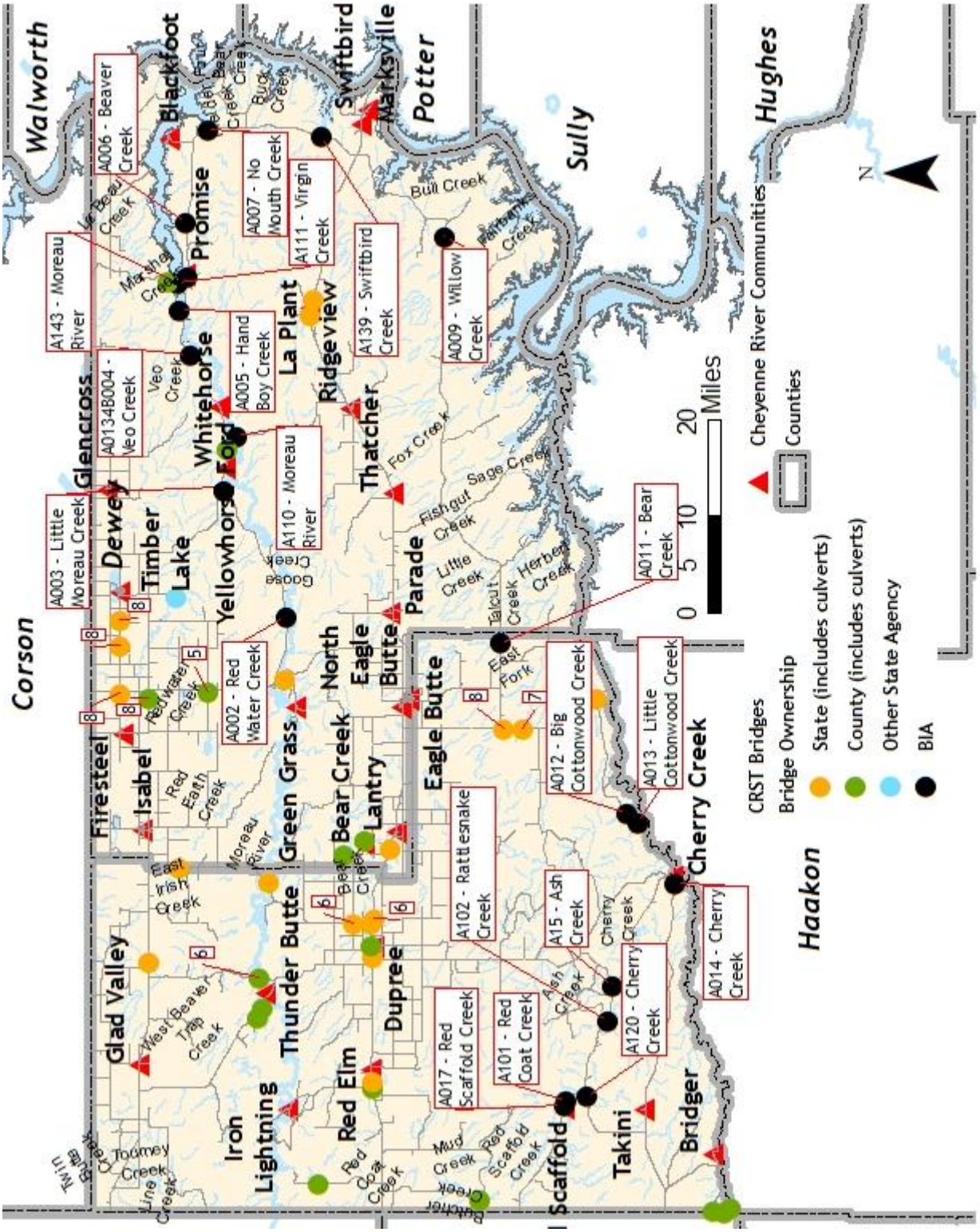


Figure 5-37 – CRST Bridge Deficiencies

Structure Number	Remarks
A01340B004	Fasten end treatment at SW approach rail to rail post.
A002	Structure needs upgraded bridge rail system and the addition of approach guardrail. Routine maintenance is required on the structure.
A003	Required signs: (2) "Weight Limit 20 Tons" signs; (4) black & yellow clearance signs; (1) "Little Moreau Creek" sign. Structure requires some maintenance: bridge rail needs to be brought into compliance with AASHTO standards and an approach guardrail system needs to be installed.
A005	Required signs - (1) "Narrow Bridge". No significant change in condition. Bridge rail and guardrail requires repairs -new terminal needed at NW corner of approach guardrail and bridge rail should match the face of the curb.
A006	Repair scoured areas with compacted soil and protect with riprap; install approach guardrail and match bridge rail with face of curb; repair/seal deck and pave approaches.
A007	Required signs: (2) “Weight Limit 20 Tons" signs. Post required signs. Install complete approach rail system, with stiffened transitions to bridge rail, in accordance with current AASHTO criteria, and rehab or replace bridge rail to bring rail face to flush above face of curb. Monitor erosion on south bank of stream. Clean debris from deck. Schedule for bridge replacement.
A011	Required signs - (4) black & yellow clearance signs. Bridge requires an approach guardrail system, the bridge rail face needs to match curb face, bridge rail height below AASHTO standards; repair spalls and leaks between deck units.
A012	New transition/approach rails with end treatments are required to improve traffic safety. Riprap required on abutment slopes and channel banks. Continue monitoring both piers, poor degraded concrete along nose, shaft & foundation. Recommend further testing to determine depth of faulty concrete in piers.
A013	No significant changes in condition - continue to monitor bridge slope erosion
A014	Required signs - (4) black & yellow clearance signs (2) "Cherry Creek" signs. No significant change in condition
A015	Some maintenance and repair required - install 4 new clearance markers at bridge corners. Although guardrail system appears adequate, bridge rail does not meet current standards - NW bridge rail end needs to be reattached to post. Bridge rail and approach guardrail height below AASHTO standards.
A017	Required signs - (2) "Narrow Bridge" signs. Complete routine maintenance, repair abutment slopes - both sides, install an approach guardrail system, block out bridge rail to match the face of the curb, and seal the deck.
A101	Required signs - (4) black & yellow clearance signs. Some maintenance and repair required - although guardrail system appears adequate, bridge rail and approach guardrail heights do not meet AASHTO standards. Deck joints need to be cleaned & sealed.
A102	Need routine maintenance and bridge requires an approach guardrail system. Both abutment slopes require repair and protection.
A110	Monitor abutment slopes for sloughing, erosion, or additional undermining of abutments. Reconstruct approach guardrails, or regrade embankment below, to provide proper rail height. Repair collision damage.
A111	Required signs - (1) "Weight Limit 23 Tons" sign; (2) black & yellow clearance signs. No significant changes in condition. Clean and seal deck joints, install new approach guardrail system and continue across bridge so bridge railing matches face of curb.
A120	No significant change in condition.
A139	Routine maintenance required and concrete repair of spalls.
A143	Required signs - (2) "Weight Limit 17 Tons" signs, (2) "Narrow Bridge" signs. Install complete approach rail system, with stiffened transitions to bridge rail, in accordance with current AASHTO criteria. Rehabilitate or replace bridge rail to repair damaged areas and to place rail flush above face of cub. Rehabilitate or replace expansion joints. Seal Deck. Remove sand and sediment from deck.

FIGURE 5-38 - 2017 CRST Bridge Conditions

Structure Number	Feature Intersected	BIA Route	Location	Length (feet)	Sufficiency Rating	Inspection Date	Year Built
A002	Red Water Creek	2	5.1 mi E of Hwy 63	69.9	85.4	Jul 2017	1961
A003	Little Moreau Creek	2	1.9 mi W of White Horse	80.0	73.4	Jul 2017	1960
A005	Handboy Creek	3	1.9 mi W of Rte 7 Jct	94.1	85.0	Jul 2017	1964
A006	Beaver Creek	7	4.5 mi E of Promise	93.8	76.9	Jul 2017	1960
A007	No Mouth Creek	7	15.9 mi N of Jct Rte 7/Hwy 212	100.7	63.2	Mar 2017	1960
A011	Abear Creek	9	6.2 mi E of Hwy 63 Jct	69.9	88.9	Jul 2017	1962
A012	Big Cottonwood Creek	12	8.4 mi NE of Cherry Creek	94.1	82.5	Jul 2017	1969
A013	Little Cottonwood Creek	12	6.2 mi NE of Cherry Creek	94.1	94.7	Jul 2017	1969
A014	Cherry Creek	11	0.6 mi W of Cherry Creek	157.1	98.7	Jul 2017	1968
A015	Ash Creek Bridge	6	10.2 mi W of Cherry Creek	105.3	90.3	Jul 2017	1968
A017	Red Scaffold Creek	6	Red Scaffold	80.0	83.3	Jul 2017	1960
A101	Red Coat Creek	6	1.2 mi SE of Red Scaffold	87.9	96.7	Jul 2017	1976
A102	Rattlesnake Creek	6	8.1 mi SE of Red Scaffold	87.9	84.9	Jul 2017	1986
A110	Moreau River	8	2.4 mi SE of Whitehorse	200.1	97.1	Mar 2017	1987
A111	Virgin Creek	7	0.3 mi E of Promise	147.9	82.8	Jul 2017	1961
A120	Cherry Creek	13	2.5 mi SE of Red Scaffold	220.1	95.6	Jul 2017	1987
A139	Swiftbird Creek	7	4.3 mi N of US 12 and BIA 7 JCT	154.8	92.6	Jul 2017	2004
A143	Moreau River	7	0.4 mi N of Promise	417.9	69.9	Mar 2017	1961

Culvert Conditions

Although some culverts are in good condition, there are culverts throughout the Reservation that have become aged with broken inlet flares and expansive outlet scours. There are several culverts on the Reservation with noted deficiencies that are in dire need of repair. Following flooding in Spring 2019 at least seven culverts washed out and caused road failures; three were repaired on an emergency basis.

Refer to Figure 5-36 for culvert locations listed in the NBI and assigned condition codes. The bulleted list below describes the condition code assigned to each culvert. Code descriptions were obtained from the *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nations Bridges*, US DOT, FHWA. It is important to note that most of the culverts on the Reservation are not listed in the NB, and the ones that are listed are owned by either the state or county.

- 8 – No noticeable or noteworthy deficiencies which affect the condition of the culvert. Insignificant scrape marks caused by drift.
- 7 – Shrinkage cracks, light scaling, and insignificant spalling which does not expose reinforcing steel. Insignificant damage caused by drift with no misalignment and not requiring corrective action. Some minor scouring has occurred near curtain walls, wingwalls, or pipes. Metal culverts have a smooth symmetrical curvature with superficial corrosion and no pitting.
- 6 – Deterioration or initial disintegration, minor chloride contaminations, cracking with some leaching, or spalls on concrete or masonry walls and slabs. Local minor scouring at curtain walls, wingwalls, or pipes. Metal culverts have a smooth curvature, non-symmetrical shape, significant corrosion or moderate pitting.
- 5 – Moderate to major deterioration or disintegration, extensive cracking and leaching, or spalls on concrete or masonry walls and slabs. Minor settlement or misalignment. Noticeable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have a significant distortion and deflection in one section, significant corrosion or deep pitting.

RECOMMENDATIONS

It is recommended that the Tribe perform maintenance and repairs on existing bridges as specified in Figure 5-37. Official bridge inspection reports should be reviewed for a complete list of deficiencies before beginning any repairs. The Tribe should apply for federal funding for qualifying bridges through the Tribal Bridge Program; program information is discussed in “Chapter 7, Project Funding”.

Damaged and aging culverts on the Reservation should be repaired. All culverts located on BIA and Tribally owned roads within Reservation boundaries should be inspected and inventoried.

This would assist the Tribe in assessing damages and prioritizing repairs. When applicable, applications for FEMA and ERFO funding should be submitted.

Short and Long Range Projects

Figure 5-39 lists bridge or culvert projects to be completed in the short term. These projects have also been listed under safety projects in this chapter as they result from flooding in 2019 that washed out many roads and culverts.

Figure 5-39 – CRST TTIP Bridge/Culvert Projects

CRST - FLOOD DAMAGED ROADS AND CULVERTS PROJECTS IN TTIP						
Project #	Project Name	FY2021	FY2022	FY2023	FY2024	FY2025
1	ERFO Project*	$100,000.00				
2	FEMA Storm 4440**	$441,000.00				
3	FEMA Storm 4463**	$0.00				
4	FEMA Storm 4467**	$8,000.00				

*ERFO funding anticipated

**FEMA funding anticipated

The Tribe has determined that there are three bridges on the Reservation that need to be replaced. These projects are shown in Figure 5-40. They fall outside the short range schedule of the TTIP, and like all other long range plans, these should be completed as funding becomes available and prioritized by need. Because of the high costs associated with bridge replacement, it is highly recommended that grant funding be sought for these projects.

Figure 5-40 – CRST Long Range Bridge/Culvert Projects

CRST Long Range Bridge Projects				
Project #	Project Title	Project Location	Project Description	Estimated Cost
14	BIA 7 No Mouth Creek Bridge Replacement	BIA 7, south of Blackfoot, Dewey Co	Bridge Replacement	$1,000,000.00
15	BIA 7 Virgin Creek Bridge Replacement	BIA 7, east of Promise, Dewey Co	Bridge Replacement	$1,500,000.00
16	BIA 7 Moreau River Bridge Replacement	BIA 7, north of Promise, Dewey Co	Bridge Replacement	$4,180,000.00

PEDESTRIANS AND BICYCLES

For many Tribal members of the CRST, walking and bicycling are important modes of transportation. While recreation for some, for others it is the only option for travel to work, school, medical appointments, and other essential trip purposes. This chapter presents the existing conditions of pedestrian and bicycle facilities prevalent on the Reservation and offers recommendations for a more complete system.

EXISTING CONDITIONS AND RECOMMENDATIONS

Improving the ability to walk or bike involves not only providing the infrastructure but also linking design, streetscapes, and land use to support walking and bicycling. Safety is also integral when developing an inviting and functional pedestrian and bicycle system. Pedestrian traffic represents a disproportionate percentage of road-related fatalities according to national studies. Safety concerns surrounding walking and bicycling require careful attention and application of countermeasures.

Most pedestrian and bicycling activity within the Reservation occurs on or adjacent to the roadway facility. Some sidewalks are available in Cherry Creek, Dupree, Eagle Butte and North Eagle Butte, La Plant, Promise, Takini, and Timber Lake. There are some wider shared use paths in Eagle Butte. There are areas throughout the Reservation where worn, dirt paths exist that were created by repetitive pedestrian and bicycle use, but which haven't been improved.

Although sidewalk conditions on the Reservation vary, many of the sidewalks observed are old and have settled, causing trip hazards, or carry other issues associated with disrepair or a lack of maintenance. Some pedestrian facilities are not compliant with the Americans with Disabilities Act (ADA). This typically occurs because of inadequate ramp design or a lack of ramps at intersections, or gaps in the sidewalk system.

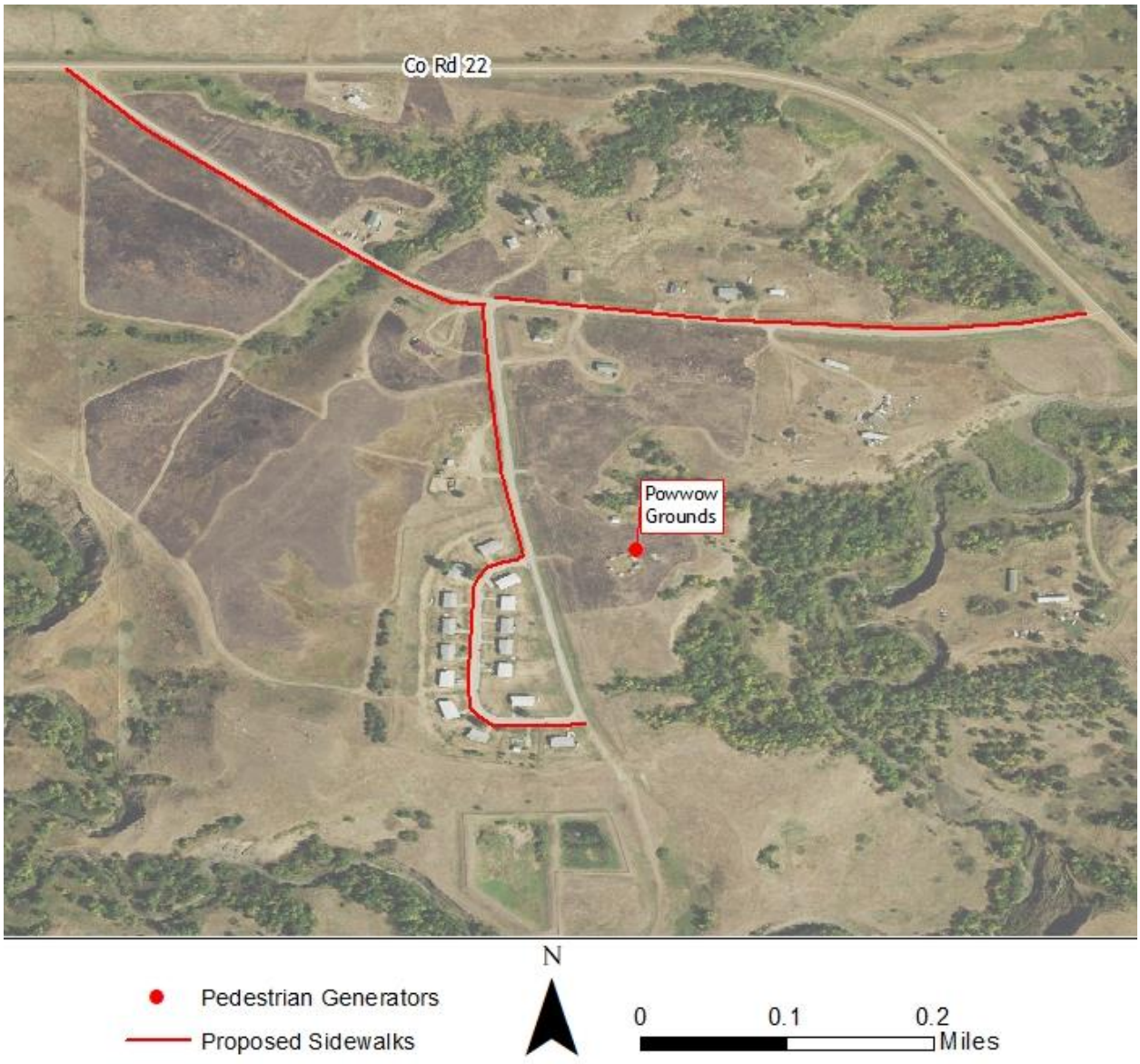
There are many locations within the Reservation that are not served by sidewalks or paved shared use paths. Additionally, there are many missing links in the system. Construction of wider shoulders in street design is a method of providing pedestrian and bicycle facilities beyond provision of sidewalks and paved shared use paths. This method is most useful along highways where heavier use is expected but where separated facilities are not likely to be installed.

Each town across the Reservation would benefit from installation of more sidewalks and/or shared use paths and bike racks. Bike racks are an inexpensive way to encourage biking and offer added security. Figures 5-41 through 5-58 are aerial maps that show existing sidewalks and shared use paths in the study area communities along with recommended placement of additional sidewalks, shared use paths, and bike racks.

Bear Creek Sidewalks

There are no existing sidewalks in Bear Creek, a small community located approximately four miles north of US Hwy 212 off County Road 22. It is recommended that sidewalks be constructed 0within the housing district and extended to both Country Road 22 accesses as shown in Figure 5-41.

Figure 5-41 – Proposed Sidewalks – Bear Creek

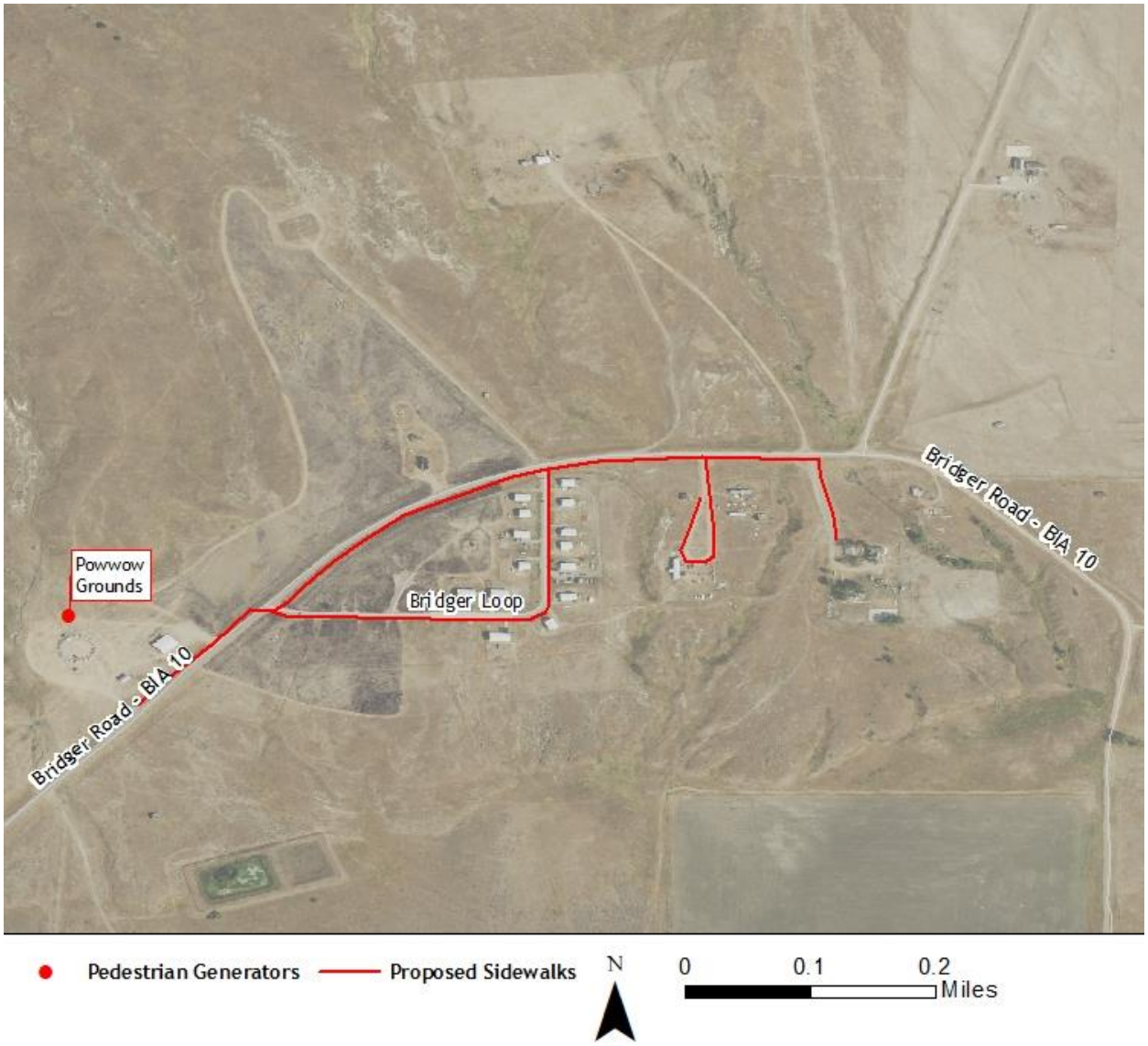


Blackfoot, also known as Moreau, is located in the NE portion of the Reservation. It consists of a housing development with approximately 10 single-family residences and a church that is located northeast of the development. There are no existing sidewalks. Sidewalks are recommended to connect housing and the church as shown in Figure 5-42.

FIGURE 5-42 - Proposed Sidewalks - Blackfoot

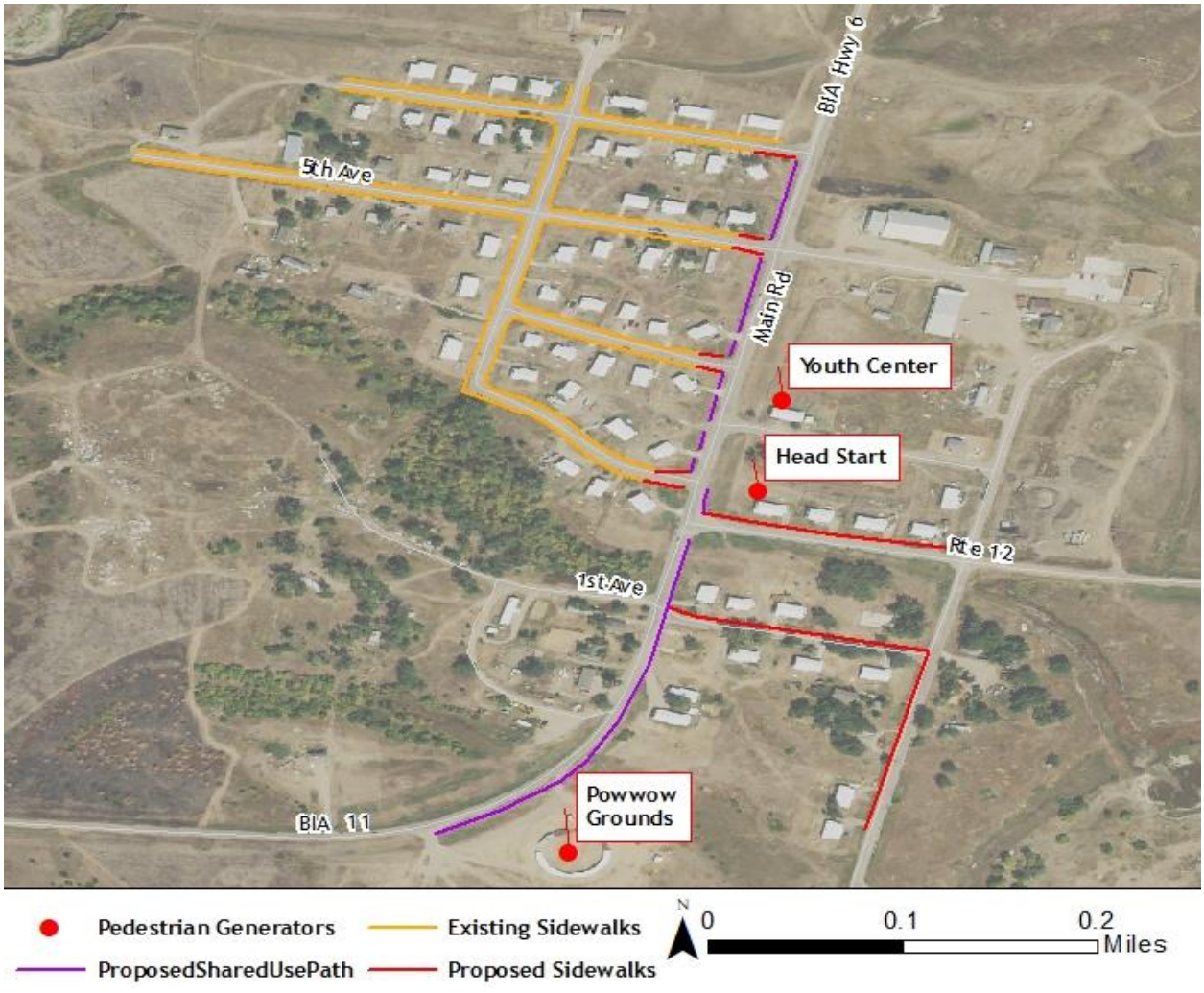
Bridger is a small community located in the southwest corner of the Reservation approximately 0.75 miles east of SD 34. Sidewalks are recommended to connect residential homes to Bridger Road as shown in Figure 5-43, along with a sidewalk along Bridger Road leading to the Powwow grounds.

Figure 5-43 – Proposed Sidewalks - Bridger



Cherry Creek is the largest unincorporated community on the Reservation. There are existing sidewalks throughout the housing development west of Main Road. They have varying degrees of settling, lack wheelchair accessible ramps, and most of them stop 40-70 feet short of Main Road. It is recommended to repair or replace the existing sidewalks as funding allows, bring them into ADA compliance, and extend them out to Main Road. A shared use path is proposed to run the length of Main Road and BIA 6 to the south access of the Powwow grounds as shown in Figure 5-44. In addition to providing a pedestrian and bicycle facility through town, it will also connect residents to the new community building planned for construction in the southwest part of town. Sidewalks are also recommended on Route 12, 1st Avenue, and the unnamed street parallel to BIA 6/Main Road, to provide pedestrian facilities to residents living along those roadways.

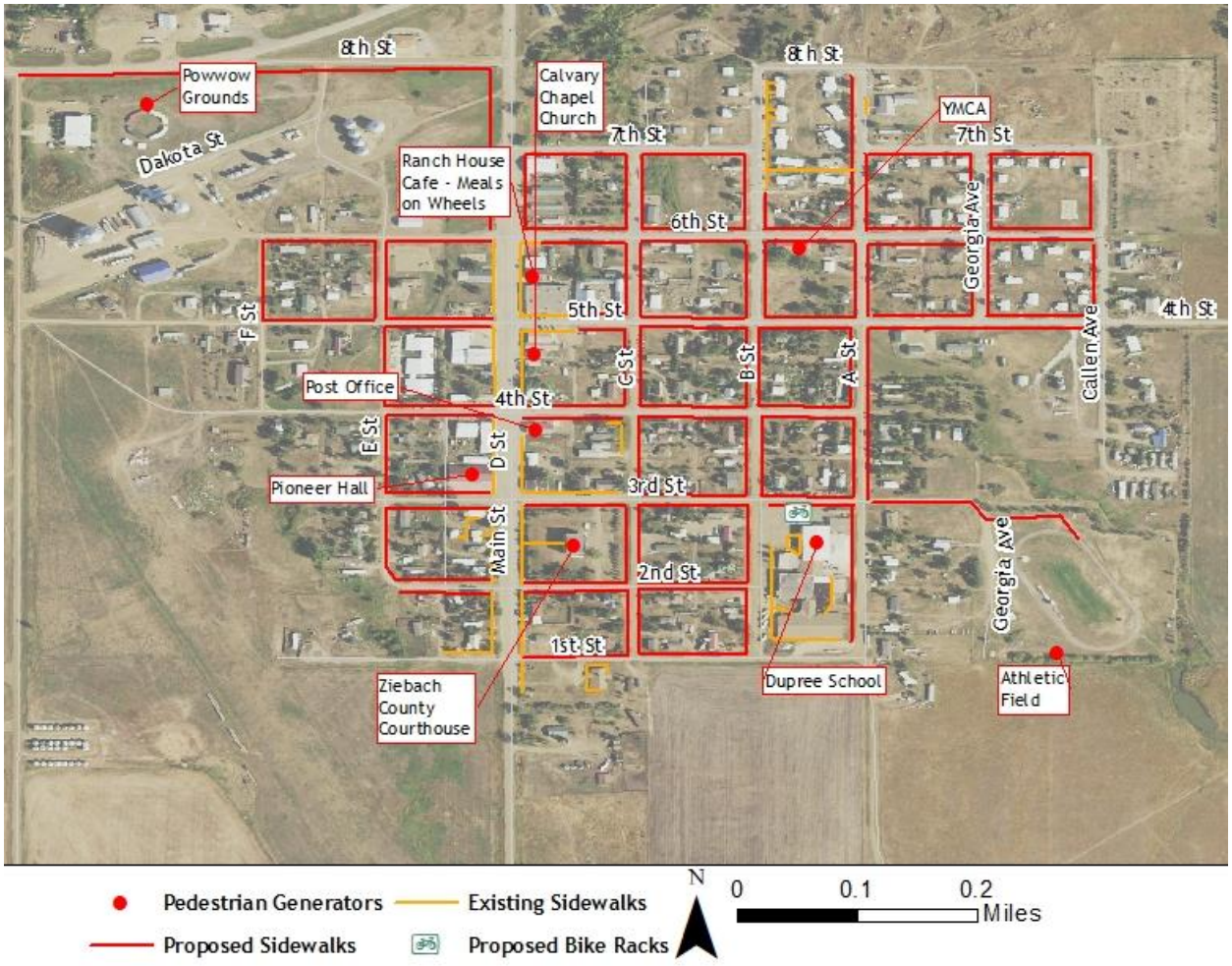
Figure 5-44 – Existing and Proposed Sidewalks – Cherry Creek



Existing sidewalks in Dupree are segmented and limited to Main Street, with a few around Dupree School and housing in the north part of Dupree. Like many other existing sidewalks in Reservation communities, they are old and in disrepair. These sidewalks should be repaired or replaced as funding allows and brought into ADA compliance. Dupree residents would benefit from interconnected sidewalks that would allow pedestrians a safe route to their destinations.

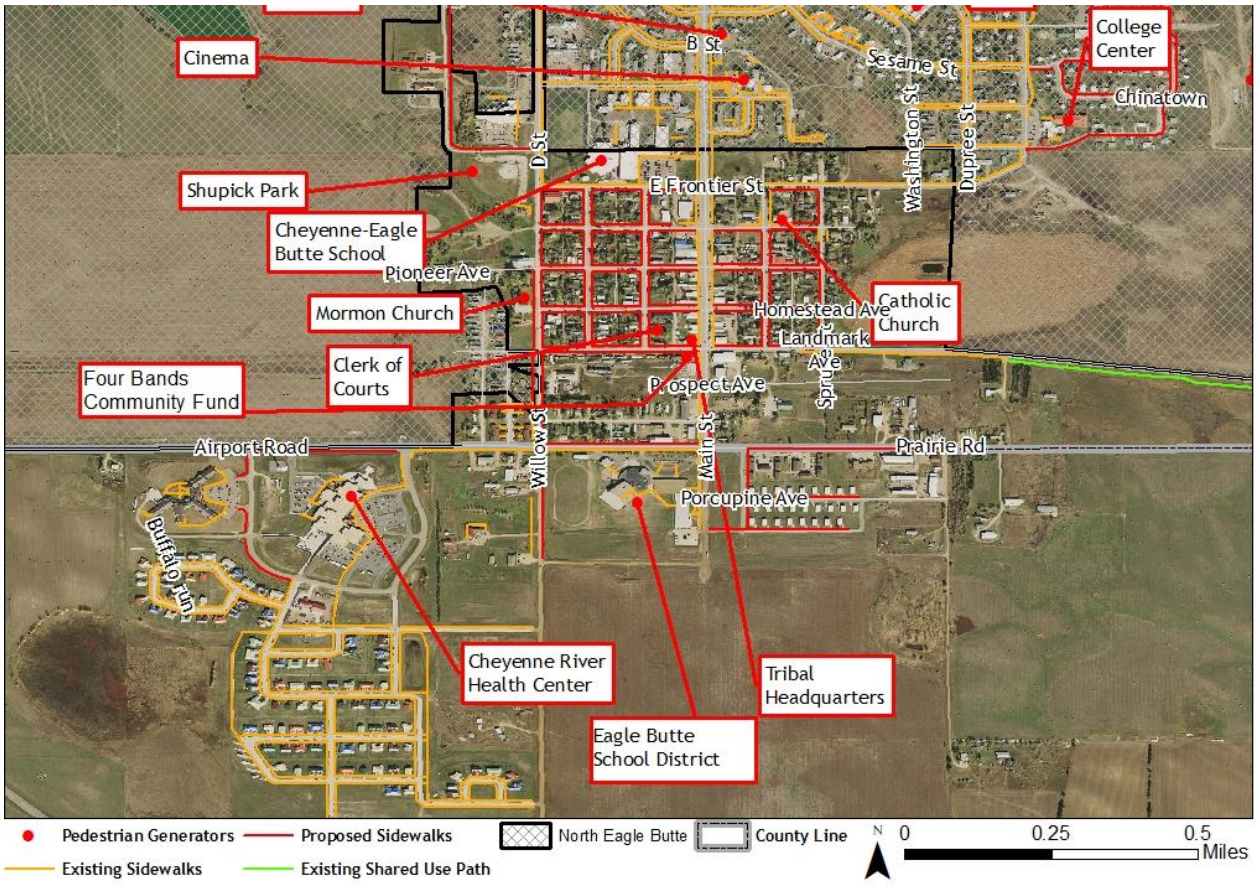
While sidewalk placement is recommended throughout the community of Dupree, priority should be given to Tribal Housing located between 5th Street and 8th Street east of Main Street. See Figure 5-45. A sidewalk along 8th Street on the west side of Main Street leading to the Powwow grounds is also recommended, as are sidewalks along A Street and B Street leading to Dupree School.

Figure 5-45 – Existing and Proposed Sidewalks - Dupree



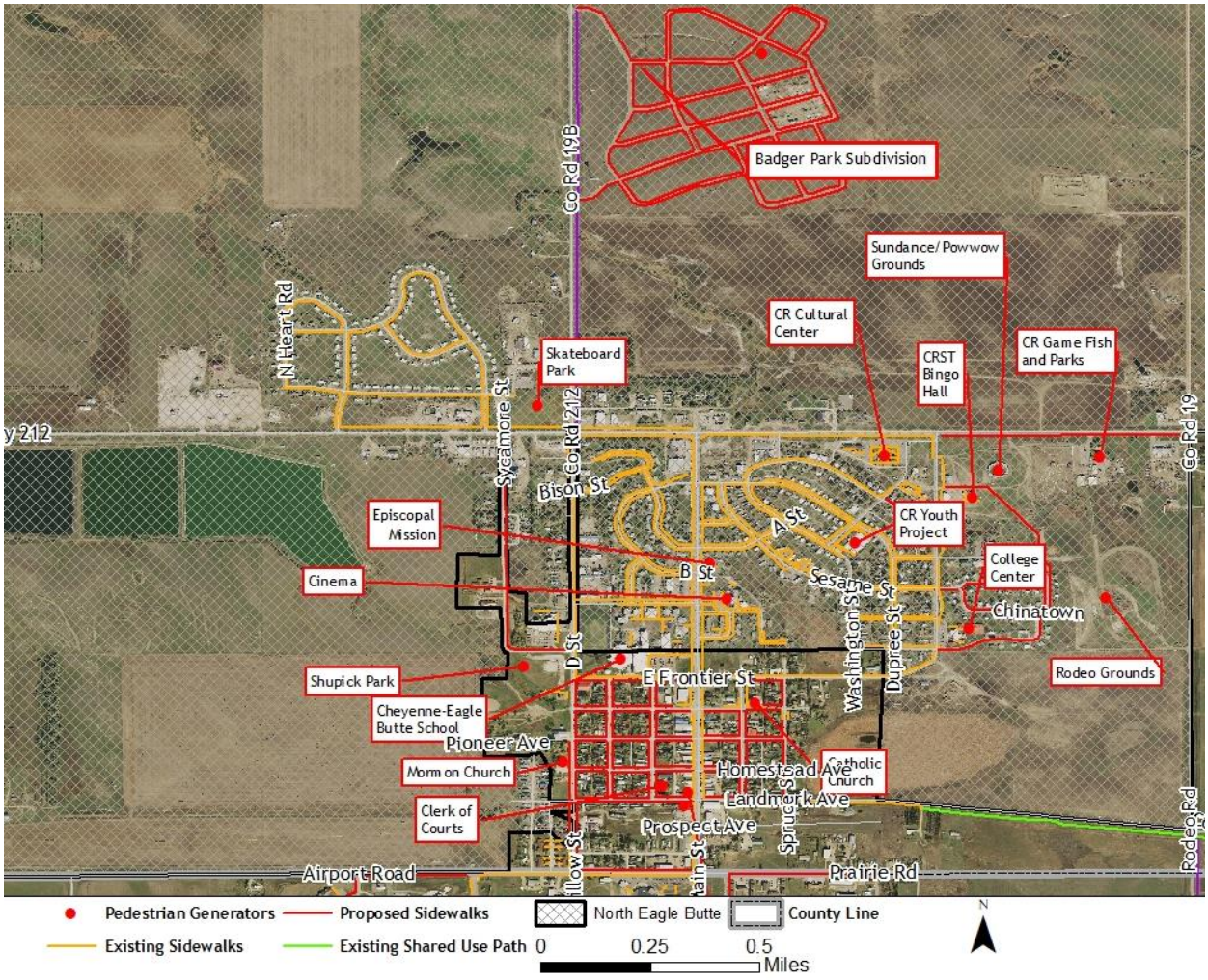
Eagle Butte has a good interconnected sidewalk system in the housing development located south of the Cheyenne River Health Center. Sidewalks are also located around both the Cheyenne Eagle Butte School and Eagle Butte School District and in a few isolated areas around town. Figure 5-46 shows the recommended sidewalks throughout Eagle Butte that would connect residents to schools, businesses along Main Street, and local churches.

Figure 5-46 – Existing and Proposed Sidewalks – Eagle Butte



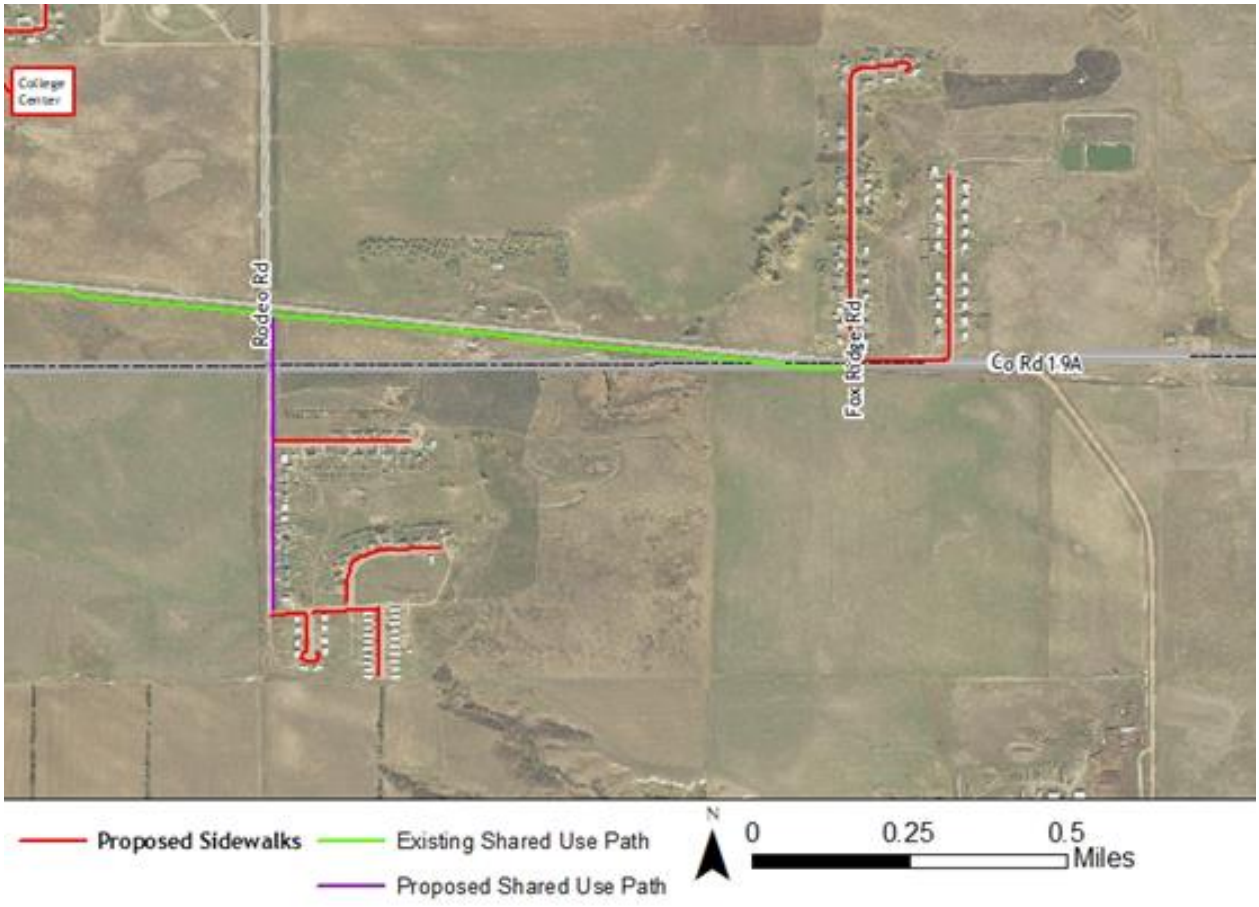
In North Eagle Butte, the sidewalk systems in the central part of town and in the housing development located north of US 212 and west of County Road 19B are well connected and nearly complete. It is recommended sidewalks be added where they are currently missing on the west and east sides of town and in Badger Park subdivision as seen in Figure 5-47. A shared use path is also recommended along County Road 19B from US 212 to the north access of the Badger Creek Subdivision.

Figure 5-47 – Existing and Proposed Sidewalks – North Eagle Butte



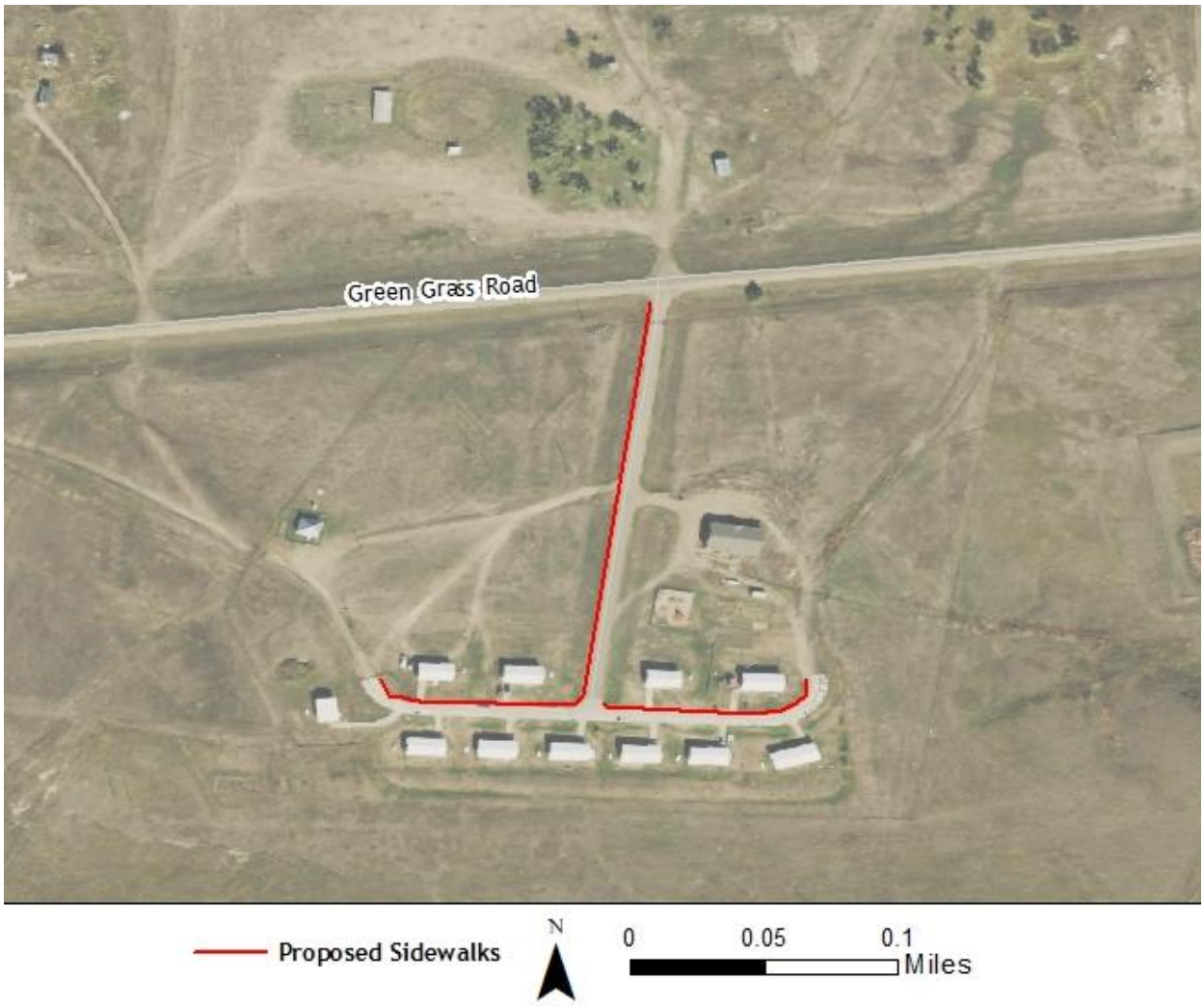
There is a shared use path which connects Eagle Butte to the Fox Ridge housing development on the north side of County Road 19A. See Figure 5-48. It is recommended to construct a shared use path from the intersection of Rodeo Road and County Road 19A south to the Habitat for Humanity housing located adjacent to Rodeo Road. It is also recommended to construct sidewalks throughout both developments.

Figure 5-48 – Proposed Sidewalks – Eagle Butte East Housing



Green Grass is located about 12 miles north of Eagle Butte in the central region of the Reservation. It is recommended to add sidewalks along the residential area extending out to Green Grass Road as shown in Figure 5-49.

Figure 5-49 – Proposed Sidewalks – Green Grass



Like many of the other small communities on the Reservation, Iron Lightning currently has no pedestrian facilities as shown in Figure 5-50. Adding sidewalks in the housing development and along Iron Lightning Road leading to the Powwow grounds is recommended.

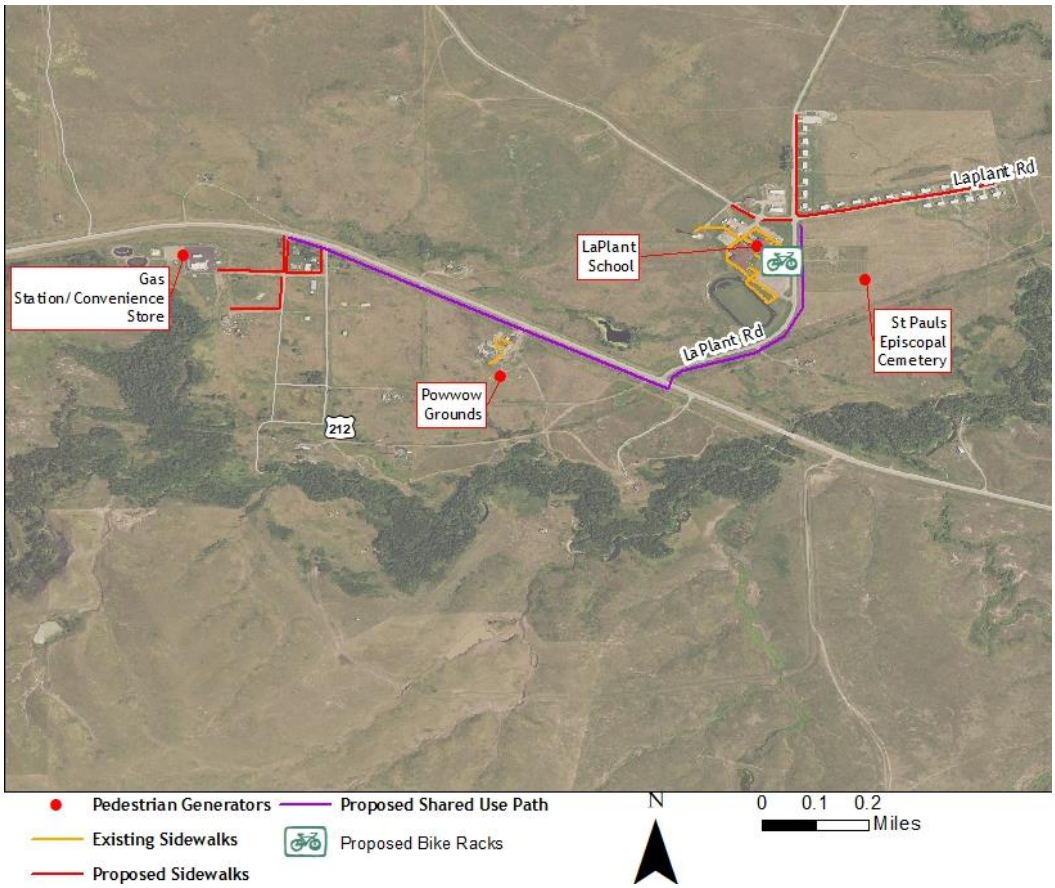
Figure 5-50 – Proposed Sidewalks - Iron Lightning

La Plant is located just off US Hwy 212. There is housing and a school located on the NE side of the highway, with Powwow grounds and additional housing on the SW side. There are existing sidewalks around the school. There is also a new gas station and convenience store on the SW side which was constructed in 2018. Although not yet open for business, this will likely generate more traffic on an already busy roadway.

There is concern about pedestrian/bicycle safety as there are no current facilities along US Hwy 212 and there is a curve present east of the convenience store. Furthermore, the posted speed limit of 45 mph along this stretch of US Hwy 212 has raised concerns for people walking along or crossing the roadway. Provision of a shared use path along US Hwy 212 and a high visibility crossing at La Plant Road would be beneficial.

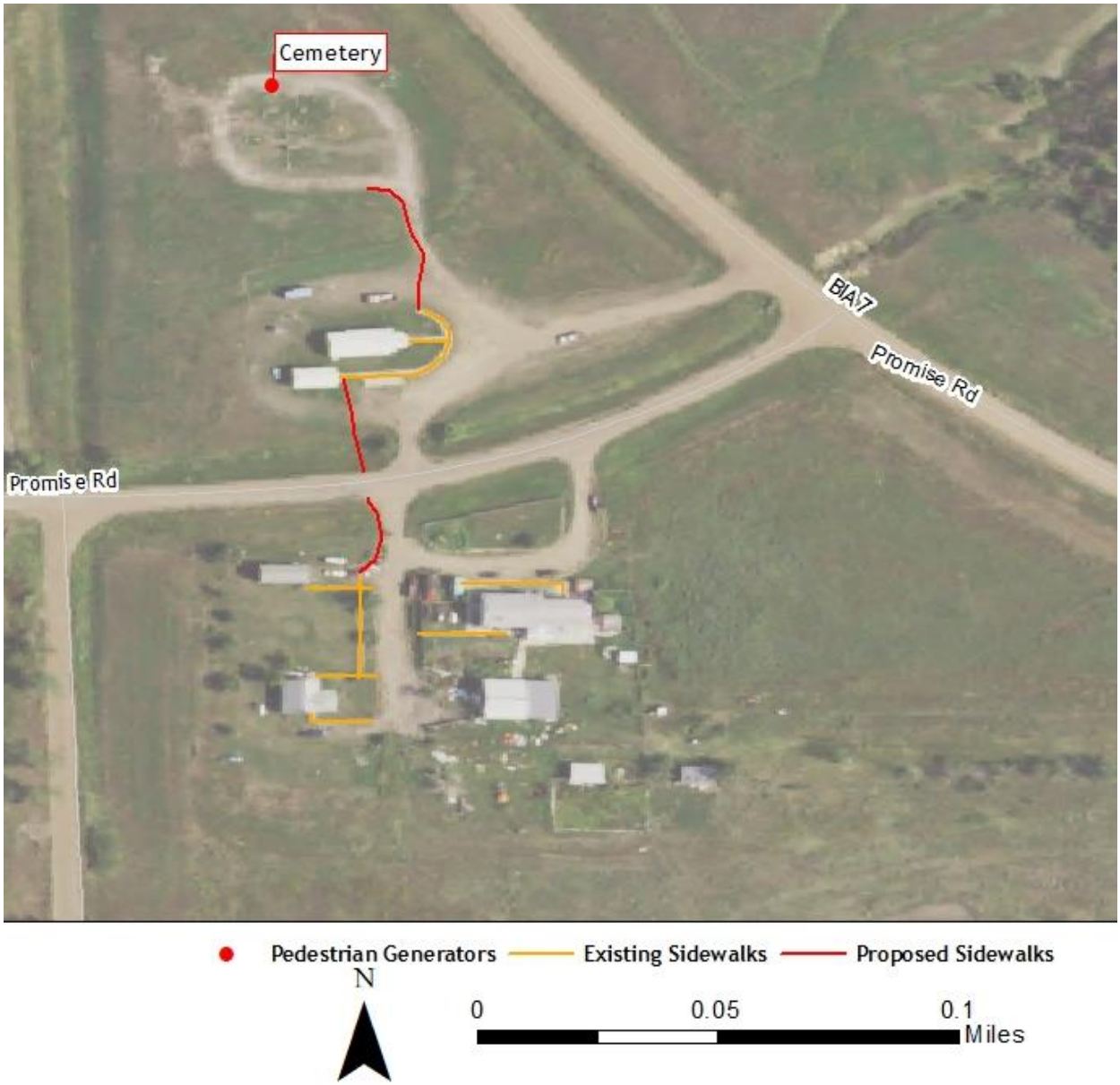
It is recommended to construct a shared use path along US Hwy 212 from the access into the convenience store to the spur of La Plant Road north of the school as shown in Figure 5-51. A high visibility crossing should be placed at the La Plant Road intersection. It is also recommended to add sidewalks along residential streets and place a bike rack at the school.

Figure 5-51 – Existing and Proposed Sidewalks – La Plant



Promise has some existing sidewalks. It is recommended to construct sidewalks that would connect to the cemetery and to Promise Road as shown in Figure 5-52.

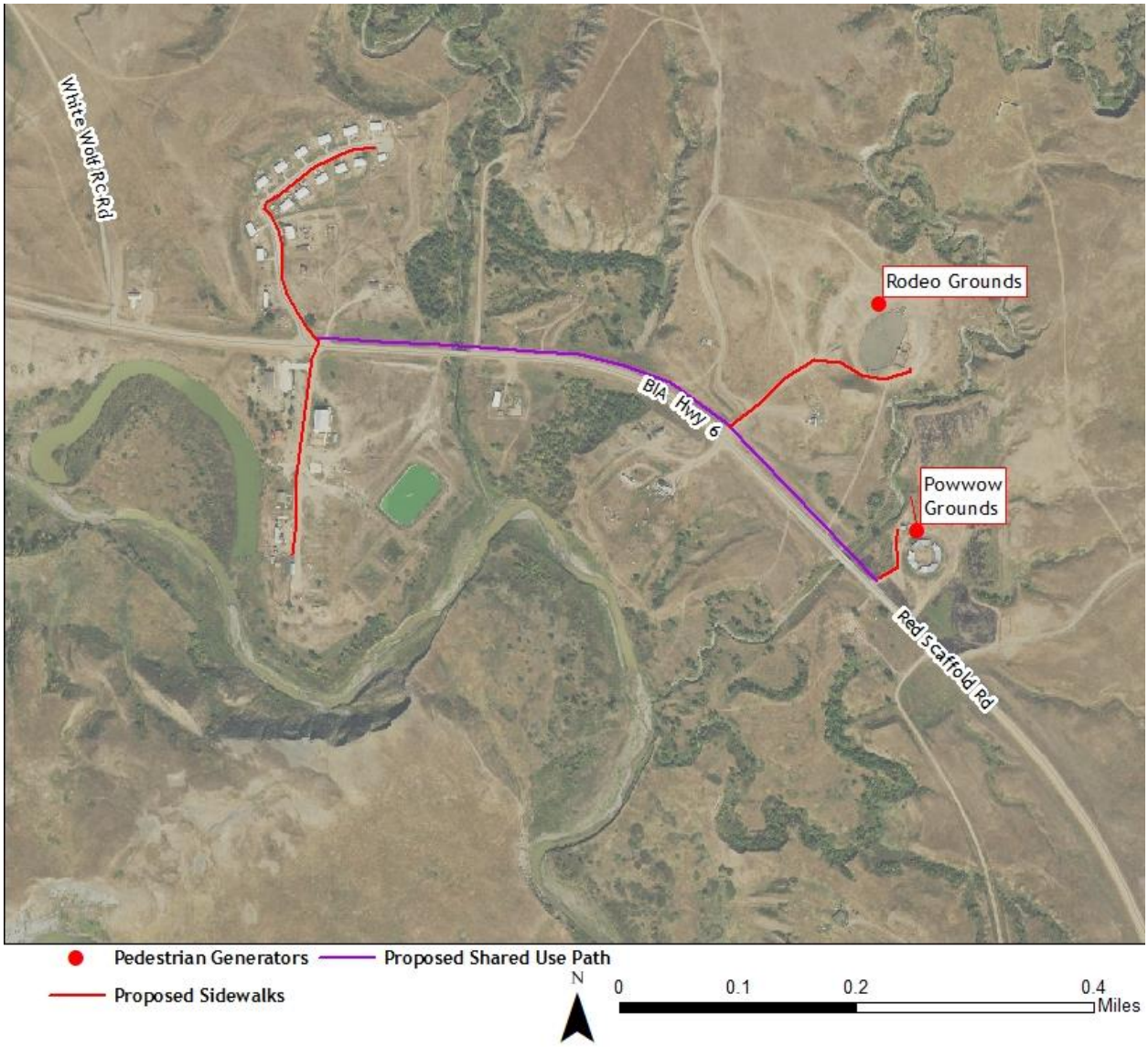
Figure 5-52 – Proposed Sidewalks - Promise



Red Scaffold is located along BIA Hwy 6. There is a housing development located on the north side of the highway. Powwow grounds are located a little more than half a mile southeast of the residences along this busy roadway.

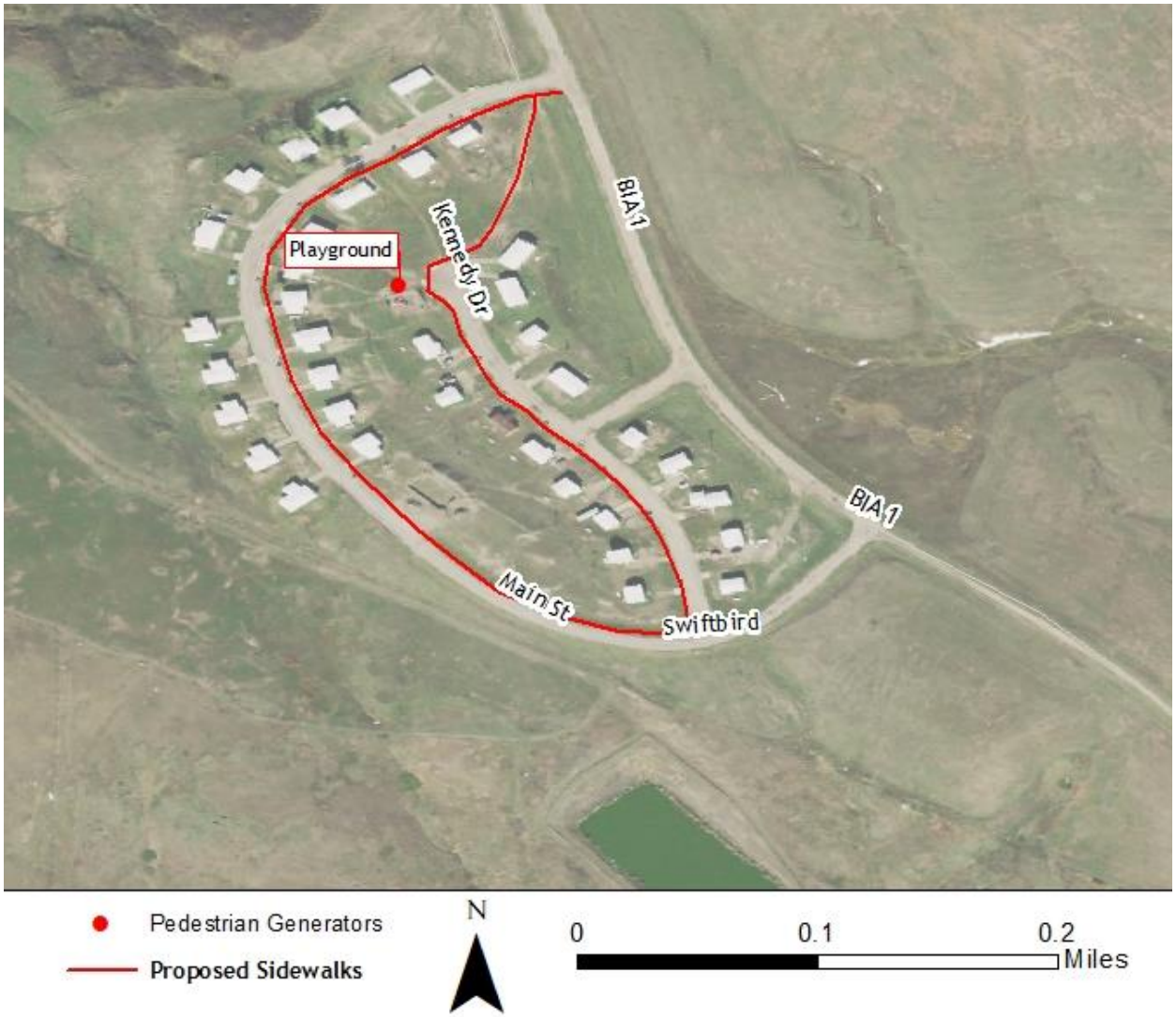
Sidewalks are recommended to connect the homes located both on the north and south sides to the highway and from the highway to the rodeo and Powwow grounds. A shared use path adjacent to the highway connecting to the rodeo and Powwow grounds as shown in Figure 5-53 is also recommended.

Figure 5-53 – Proposed Sidewalks – Red Scaffold



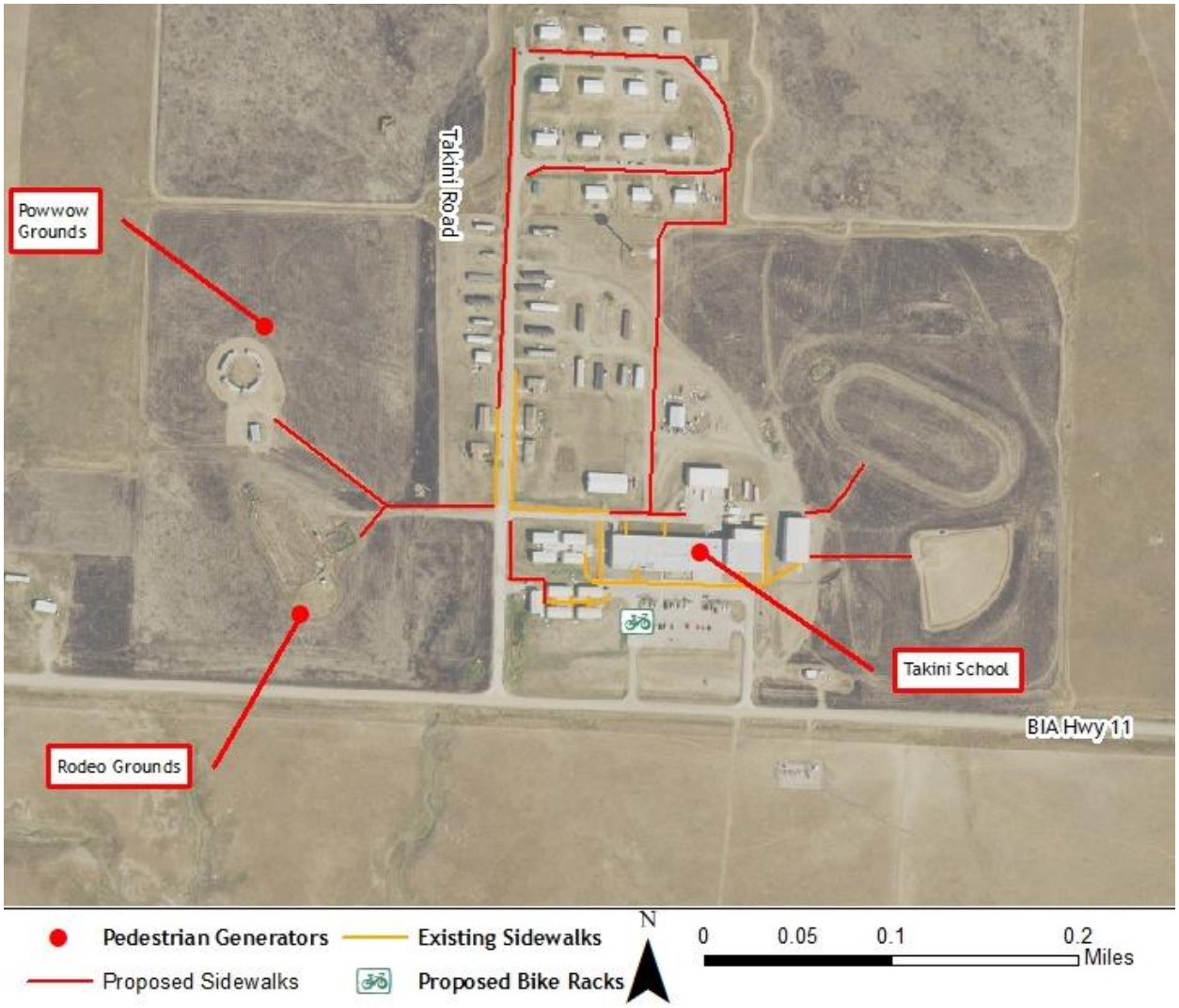
Swiftbird consists of approximately 40 single family homes and is located off US 212 on BIA 1. It is recommended to construct sidewalks throughout the development to provide pedestrian facilities to the residents living in Swiftbird. As seen in Figure 5-54, sidewalk placement is recommended beyond the exiting housing on Main Street to accommodate any future homes.

Figure 5-54 – Proposed Sidewalks – Swiftbird



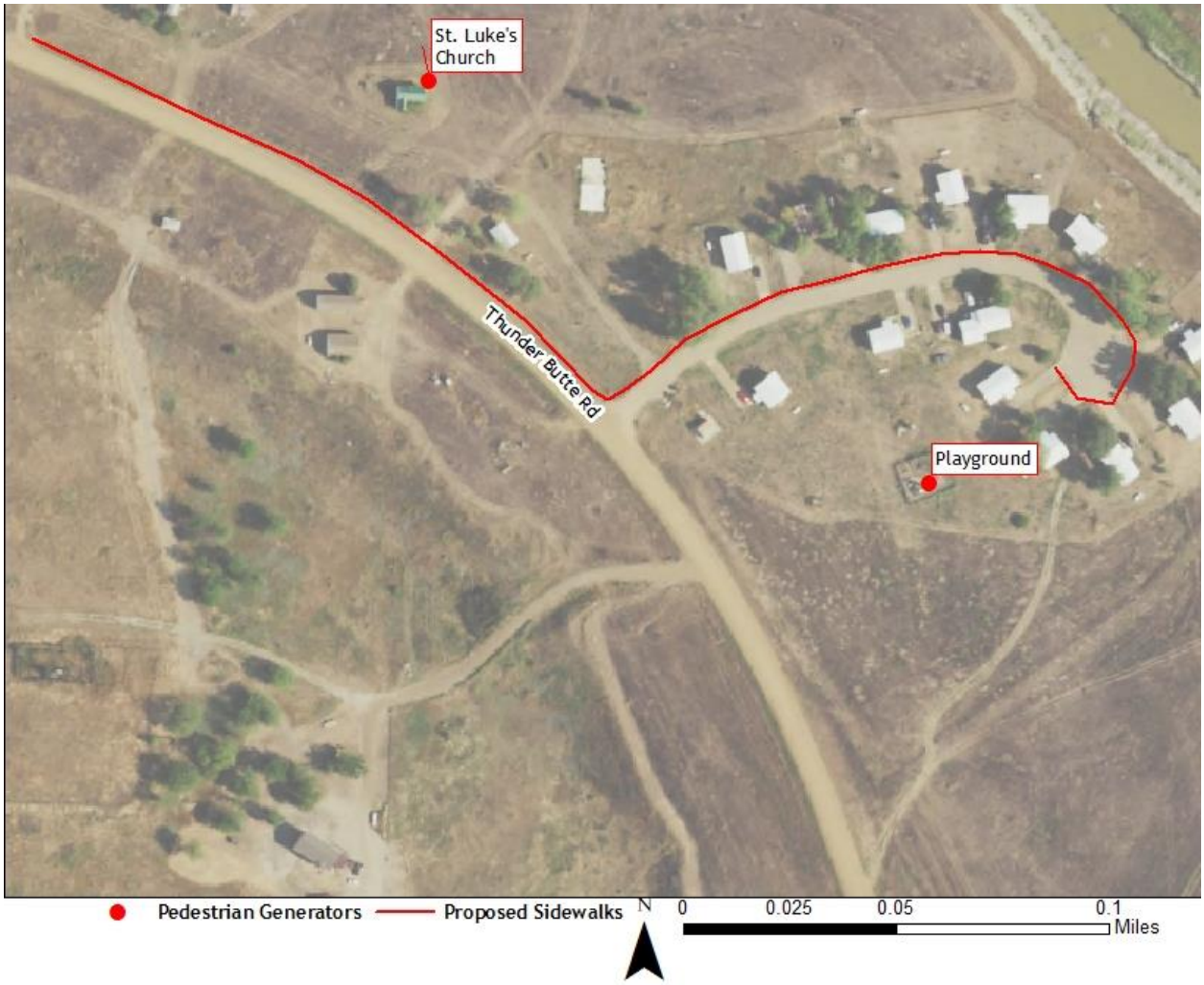
Takini is located on the north side of BIA Hwy 11. There are some existing sidewalks found mostly in the area of Takini School, as shown in Figure 5-55. Sidewalks are recommended in the residential area located north of the school and along Takini Road to connect to the school and the highway. A sidewalk leading to the Powwow and rodeo grounds is also recommended.

Figure 5-55 – Existing and Proposed Sidewalks - Takini



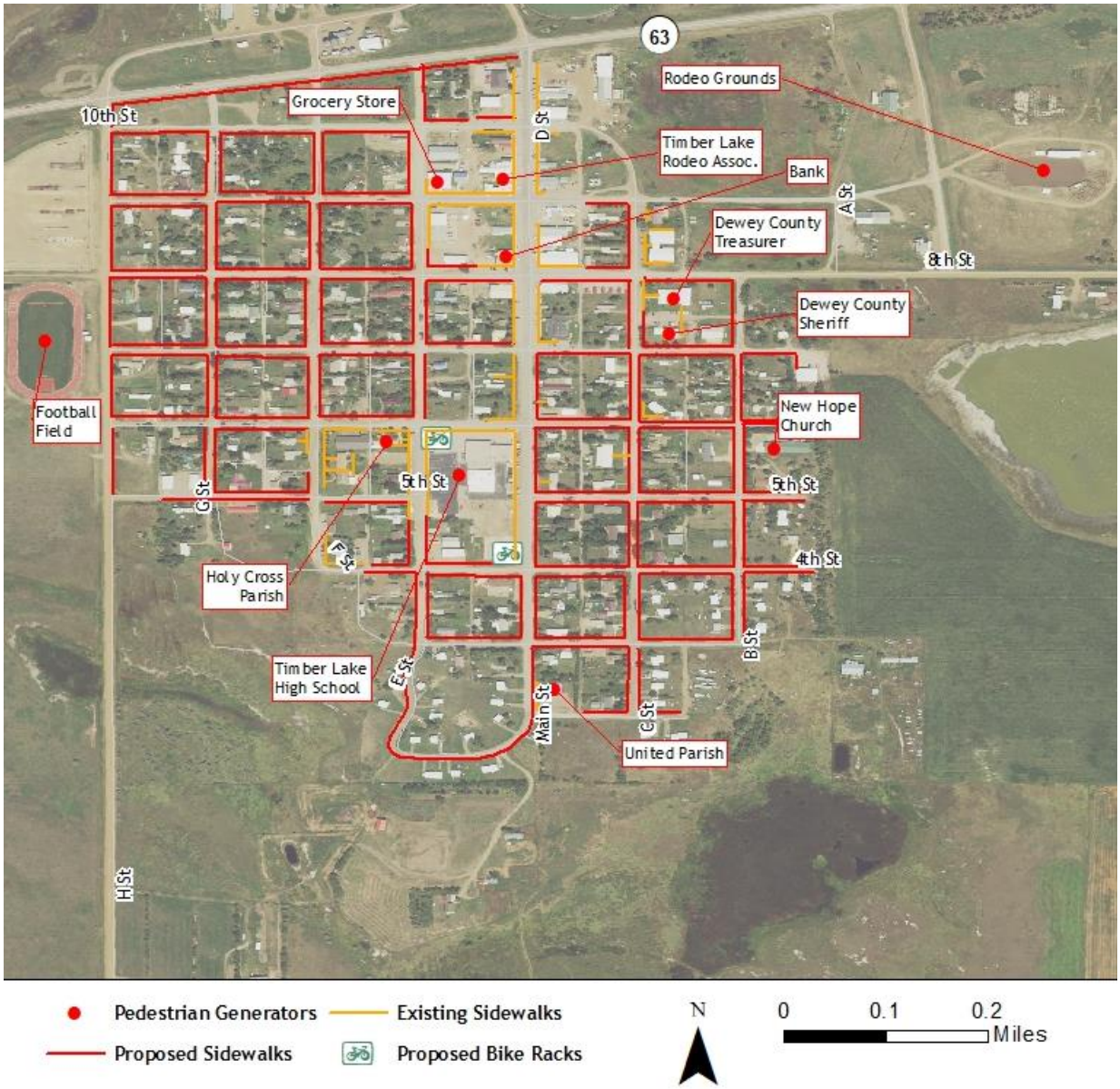
Thunder Butte is a small housing community with no existing sidewalks. It is recommended to construct sidewalks along the residential street and extending northeast along Thunder Butte Road approximately 0.25 miles to connect with residences along Thunder Butte Road, as shown in Figure 5-56.

Figure 5-56 – Proposed Sidewalks – Thunder Butte



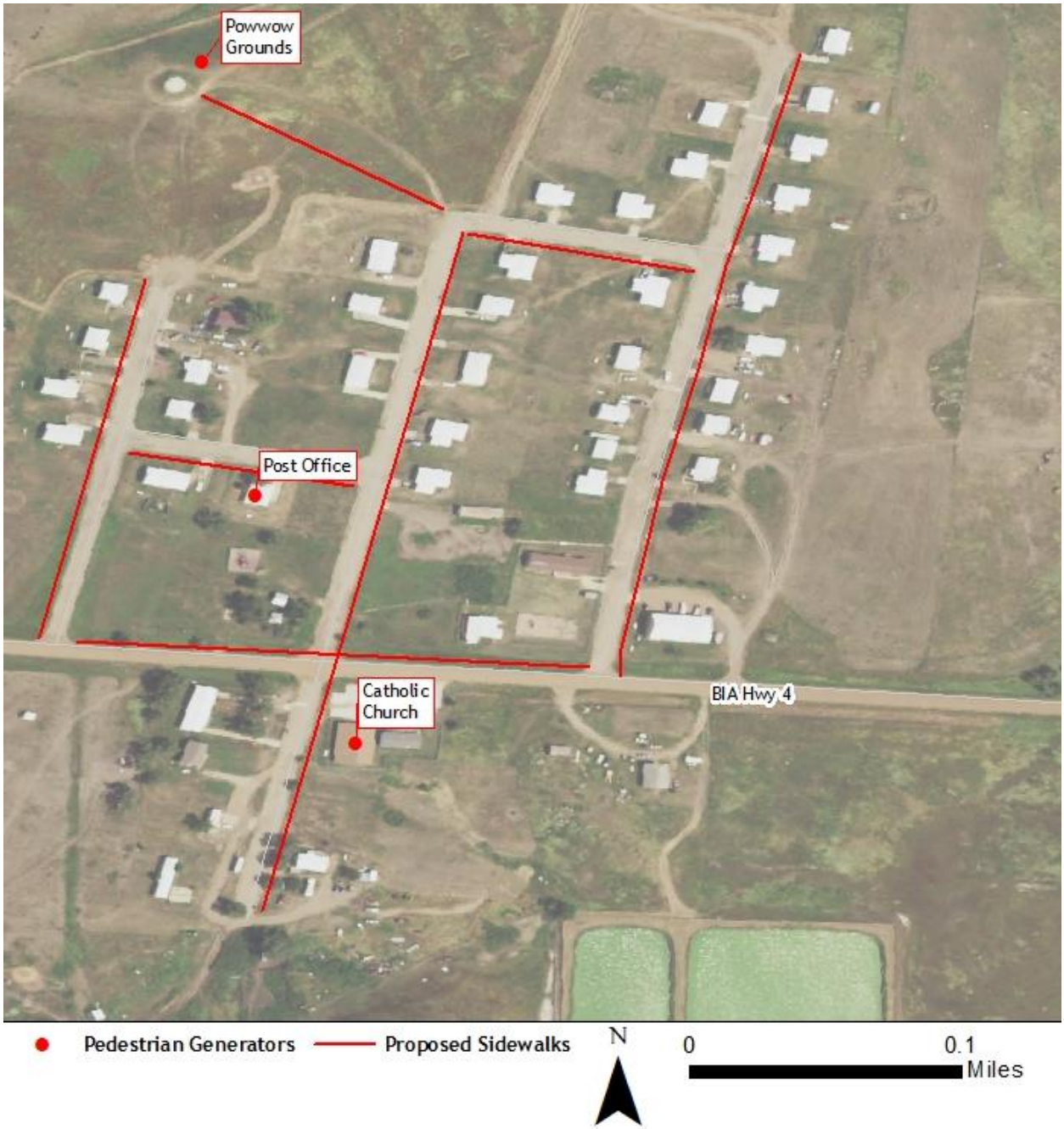
Timber Lake is located south of SD 63 and is one of the more populated communities on the Reservation. There are some existing sidewalks along Main Street and around Timber Lake High School. Most residential streets, however, are lacking pedestrian facilities. A sidewalk along SD 63 is recommended from the west edge of town to Main Street (D Street). As funding becomes available, an interconnected sidewalk system throughout town is recommended as shown in Figure 5-57 with priority given to BIA housing along 1st, 4th, 5th and C Streets. Two bike racks located at the school are also recommended.

Figure 5-57 – Existing and Proposed Sidewalks – Timber Lake



Whitehorse is located along BIA Hwy 4 and has no existing sidewalks. It is recommended to construct sidewalks along the residential streets and the highway. See Figure 5-58.

Figure 5-58 – Proposed Sidewalks - Whitehorse



Supplementary Recommendations

In addition to construction of new sidewalks and shared use paths, it is recommended that the Tribe conduct a sidewalk conditions and needs survey throughout the Reservation. A comprehensive survey would identify current sidewalk conditions, which the Tribe can then use to establish a schedule for maintenance, repairs and replacement, and new construction. It is recommended that existing sidewalks in all communities be brought into ADA compliance.

Going forward, designing roadways to accommodate all users would improve walking and biking conditions on the Reservation. This practice is commonly referred to as "complete streets" and offers the following benefits:

- Safety: A FHWA safety review found that streets designed with sidewalks, raised medians, traffic-calming measures, and treatments for travelers with disabilities improves pedestrian safety.
- Health: Multiple studies have found a direct correlation between the availability of walking and biking options and obesity rates. In fact, the Centers for Disease Control and Prevention recently named adoption of complete streets policies as a recommended strategy to prevent obesity.
- Reduced User Costs: Complete streets offer inexpensive transportation alternatives to roadway users. A recent study found that most families spend far more on transportation than on food.
- Foster Strong Communities: A recent study found that people who live in walkable communities are more likely to be socially engaged and trusting than residents living in less walkable communities.

Bicycle facilities include paved and dirt shared use paths, path lighting, and bike racks. Bike racks at populous destinations add a level of security and establishes the locations where people may park their bikes. Locations where bike racks would be beneficial are schools, Tribal offices, convenience stores, transit stops, and transit shelters.

It is important to consider maintenance when planning the construction of a shared use path. In order to ensure safety, shoulders should be mowed at least three times annually. Snow should be removed as needed to provide a clear path during winter months. The shared use path should have crack sealing performed when needed and receive a seal coat every 3-5 years. The average annual cost of these maintenance tasks is about $13,000 per mile of shared use path.

Long Range Pedestrian/Bicycle Projects

There are no pedestrian or bicycle projects programmed into the Tribe's current five year TTIP.

There were pedestrian/bicycle needs which were identified during the LRTP process and designated to be completed in the long range element of the Plan. These should be completed

as funding becomes available. Figure 5-59 lists the pedestrian and bicycle projects in the long range element of the LRTP.

Figure 5-59 – Long Range Pedestrian/Bicycle Facility Projects

Project #	Project Title	Project Location	Project Description	Estimated Cost
48	Community Sidewalks, Bear Creek	Dewey Co, see Figure 5-41	New sidewalks, 0.9 mi	$180,000.00
49	Community Sidewalks, Blackfoot	Dewey Co, see Figure 5-42	New sidewalks, 0.8 mi	$160,000.00
50	Community Sidewalks, Bridger	Ziebach Co, see Figure 5-43	New sidewalks, 1.0 mi	$200,000.00
51	Community Sidewalks, Cherry Creek	Ziebach co, see Figure 5-44	New sidewalks, 0.8 mi	$160,000.00
52	Community Sidewalks, Dupree	Ziebach Co, see Figure 5-45	New sidewalks, 4.5 mi	$900,000.00
53	Community Sidewalks, Eagle Butte	Dewey Co, Ziebach Co, see Figure 5-46	New sidewalks, 7.0 mi	$1,400,000.00
54	Shared Use Path, Eagle Butte	Dewey Co, Ziebach Co, see Figure 5-46	Shared use path w/lighting, 1.4 mi	$910,000.00
55	Community Sidewalks, North Eagle Butte	Dewey Co, see Figure 5-47	New sidewalks, 8.0 mi	$1,600,000.00
56	Shared Use Path, North Eagle Butte	Dewey Co, see Figure 5-47	Shared use path w/lighting, 0.95 mi	$617,500.00
57	Community Sidewalks, Green Grass	Dewey Co, see Figure 5-49	New sidewalks, 0.3 mi	$60,000.00
58	Community Sidewalks, Iron Lightning	Ziebach Co, see Figure 5-50	New sidewalks, 1.0 mi	$200,000.00
59	Community Sidewalks, LaPlant	Dewey Co, see Figure 5-29	New sidewalks, 1.0 mi	$200,000.00
60	Shared Use Path, LaPlant	Dewey Co, see Figure 5-51	Shared use path w/lighting, 1.0 mi	$650,000.00
61	Community Sidewalks, Promise	Dewey Co, see Figure 5-52	New sidewalks, 0.3 mi	$60,000.00
62	Community Sidewalks, Red Scaffold	Ziebach Co, see Figure 5-53	New sidewalks, 0.7 mi	$140,000.00
63	Shared Use Path, Red Scaffold	Ziebach Co, see Figure 5-53	Shared use path w/lighting, 0.5 mi	$325,000.00
64	Community Sidewalks, Swiftbird	Dewey Co, see Figure 5-54	New sidewalks, 0.8 mi	$160,000.00
65	Community Sidewalks, Takini	Ziebach Co, see Figure 5-55	New sidewalks, 1.1 mi	$220,000.00
66	Community Sidewalks, Thunder Butte	Ziebach Co, see Figure 5-56	New sidewalks, 0.4 mi	$80,000.00
67	Community Sidewalks, Timber Lake	Dewey Co, see Figure 5-57	New sidewalks, 7.7 mi	$1,540,000.00
68	Community Sidewalks, Whitehorse	Dewey Co, see Figure 5-58	New sidewalks, 0.6 mi	$120,000.00

AIRPORTS

This section of the report provides a general overview of the airports located on the Reservation. Information for this section is derived from the Federal Aviation Administration (FAA) and was retrieved from airnav.com. It is current as of September 2019. Recommendations follow.

EXISTING CONDITIONS

Cheyenne Eagle Butte Airport

Cheyenne Eagle Butte Airport is located about a mile southwest of downtown Eagle Butte. It is a unique public airport in that it is jointly owned by the Tribe and the City of Eagle Butte.

FAA operational statistics indicate an average of 43 aircraft operations per week for the 12-month period ending April 2018. Of these, 98% are transient general aviation and the remaining 2% are local general aviation operations.

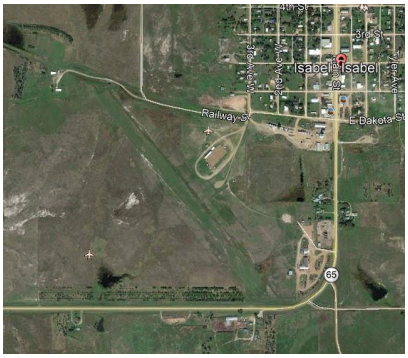
Parking services available at the airport include hangars and tiedowns. There are three single engine airplanes based on the field. Runway 13/31 is constructed of asphalt with dimensions of 4200 x 60 foot and is in good condition.

Runway edge lights are medium intensity with no lights at the touchdown point. Runway markings are non-precision in fair condition. The runway has a single wheel weight bearing capacity of 12,500 pounds. There is a seven foot wide roadway located 470 feet from runway 13 which requires a 38:1 slope to clear. Wildlife has been observed on and in view of the airport.

The Cheyenne Eagle Butte Airport is classified in the State of South Dakota as a small general aviation airport. It is included in the National Plan of Integrated Airport Systems (NPIAS), qualifying it to be eligible for federal grant funding under the Federal Aviation Administration's (FAA) Airport Improvement Program (AIP). The Cheyenne Eagle Butte Airport has received 6 AIP grants since 2010, including grants to expand and reconstruct the apron, which is an ongoing project currently in Phase 2. The complete list of awards is in Chapter 7 – Project Funding - Federal Aviation Administration Airport Improvement Program.

Isabel Municipal Airport

Isabel Municipal Airport is a public airport owned by the City of Isabel. It is classified as a small general aviation airport and is located about one-tenth of a mile outside the southwest edge of town. There is an average of 54 aircraft operations a year, with 56% transient general aviation and 44% local general aviation.



Runway 13/31 is turf in fair condition measuring 3009 X 150 feet. The runway edge lights are low intensity and edges are marked with two-foot metal A-frames. There are no end identifier lights. Trees cause an obstruction approximately 500 feet from runway 31 and require a 21:1 slope to clear. There are no airport services other than tiedowns. The Isabel Municipal Airport is not registered in the NPIAS and will not be included in the 2020 South Dakota State Aviation System Plan (SDSASP).

Timber Lake Municipal Airport

Timber Lake Municipal Airport is a public airport owned by the City of Timber Lake and located one mile southwest of town. It is classified as a general aviation airport. Aircraft operations average 87 per week for the 12-month period ending June 2016, which is the most current data available. Almost all these operations, 99%, are local general aviation with 1% transient general aviation. The airport has hangers and offers limited airframe and powerplant services. There are seven single engine airplanes based on the field.

Runway 12/30 is 3300 x 150 feet and made of turf. It is in fair condition. The runway edges are marked with yellow and black A-frame markers. There is a road located 370 feet from runway 30 which requires a 21:1 slope clearance. The Timber Lake Municipal Airport is not registered with the NPIAS will not be included in the 2020 SDSASP.

RECOMMENDATIONS

Recommendations are taken from the 2010 SDSASP, which lists target goals for South Dakota airports based on classification, and from observations made during the LRTP process.

Cheyenne Eagle Butte Airport

- Upgrade from a visual to a GPS approach type system. The Cheyenne Eagle Butte Airport does meet the SDSASP target with a visual approach system but having GPS will increase landing options of incoming aircraft.
- Construct a terminal building. The minimal SDSASP target for a small general aviation airport is a waiting area and restroom.
- Implement a flight training program.
- Construct additional hangar space for based and transient aircraft as needed.
- Purchase snow removal equipment. Snow removal is currently provided by the CRST maintenance department using their roadway equipment. Purchasing bigger plows and blowers will allow snow removal at the airport to be more efficient and allow for roadway equipment to be available for road maintenance.
- Increase airport security by controlling airfield access.

These recommendations assist the Tribe in meeting their goals for airport development. The Tribe is eligible for funding of airport projects through the Airport Improvement Program (AIP) administered by the Federal Aviation Administration (FAA). Eligibility for the program is due to the Airport's inclusion in the National Plan of Integrated Airport Systems. These grants cover 75-95 percent of eligible project costs. The Tribe should continue applying for AIP funding.

Isabel Municipal Airport

In order to meet the facility and service targets listed in the 2010 SDSASP the following changes are recommended for the Isabel Municipal Airport:

- Upgrade from turf to a paved runway surface.
- Provide covered storage for all based aircraft.
- Provide a waiting area with a public restroom.

Timber Lake Municipal Airport

In order to meet the facility and service targets listed in the 2010 SDSASP the following changes are recommended for the Timber Lake Municipal Airport:

- Upgrade from turf to a paved runway surface.
- Provide a waiting area with a public restroom

TRANSIT SYSTEM

A Tribal transit system provides a critical service to the people living on the Reservation. Many citizens rely on public transit to access healthcare, jobs, education, and daily necessities. particularly for healthcare and medical services. This chapter provides an overview of the existing transit system followed by recommendations for improvements.

EXISTING CONDITIONS

Transit services on the Reservation are provided by River Cities Public Transit (RCPT) based in Pierre, South Dakota. It contracted with CRST in 2010 to manage and operate their transit system. According to RCPT's website, it is a private nonprofit organization that receives 85% of operational funds from Federal, State, and local sources including grants and donations.

Transit services offered on the Reservation are based 100% on rider demand. Therefore, rides must be requested prior to when they are needed, and there are no bus stops or shelters located in Reservation communities. There is a passenger schedule form on the company's website that includes start and end times of requested rides for each day of the week and can be submitted either online or in person.

There are not any set routes since the service is on demand; however general times and locations are shown in Figure 5-60. RCPT offers a Farecard for a payment which can be reloaded online. Fares vary depending on distance and type of service, scheduled or taxi. One-way person fares outside of Eagle Butte range from a $4.00 scheduled trip to Bear Creek to $11.00 to get a taxi service to Bridger. RCPT accepts Medicaid as a form of payment for eligible rides.

There is also shuttle service to/from Mobridge and Bismarck. The fares for this service are $10.00 one way/$20.00 round trip to Mobridge and $20.00 one way/$40.00 round trip to Bismarck. Departure times for the shuttle are shown in Figure 5-61.

Figure 5-60 -RCPT Schedule for CRST Communities

Eagle Butte Going West AM Routes

- Leave Eagle Butte at 5:30 am (If there is a Isabel pick up scheduled)
- Isabel – 6:30 am (pick up)
- Thunder Butte – Pick up To Be Determined
- Dupree – 7:00 am (pick up)
- Bear Creek – 7:30 am (pick up)
- Lantry – 7:45 am (pick up)
- Arrive in Eagle Butte at 8:00 am

Eagle Butte Going East AM Routes

- Swiftbird – 7:00 am (pick up)
- Laplante – 7:20 am (pick up)
- Ridgeview – 7:30 am (pick up)
- Arrive at Eagle Butte at 8:00 am

Eagle Butte Going North East AM Routes

- Whitehorse – 7:30 am (pick up)
- Arrive at Eagle Butte at 8:00 am

Eagle Butte Going North AM Routes

- Leave Eagle Butte at 6:00 am
- Timberlake – 7:00 am (pick up)
- Green Grass – 7:30 am (pick up)
- Arrive in Eagle Butte at 8:00 am

Eagle Butte Going South AM Routes

- Start in Cherry Creek 6:30 am
- Cherry Creek – 6:45 am (pick up)
- Red Scaffold – 7:15 am (pick up)
- Arrive in Eagle Butte at 8:00 am

Figure 5-61 – Eagle Butte to Mobridge/Bismarck Shuttle

Eagle Butte to Bismarck – Monday and Thursdays	
Departure Times	
Eagle Butte	4 am
Mobridge (GRC)	6 am (arrive)
Timber Lake	7 am (arrive)
Mobridge (GRC)	12:30 pm (5 hours, 45 minute layover)
McLaughlin (Cenex)	1:05 pm
Fort Yates (Transit)	1:35 pm
Bismarck (Transit)	2:50 pm

Bismarck to Eagle Butte – Mondays and Thursdays	
Departure Times	
Bismarck (Transit)	9:30 am
Fort Yates (Transit)	10:45 am
McLaughlin (Cenex)	11:15 am
Mobridge (GRC)	11:40 am (arrive)
Mobridge (GRC)	6:00 pm (6 hours, 20 minute layover)
Eagle Butte	8:00 pm (arrive)

RECOMMENDATIONS

According to Ron Baumgart, Executive Director at RCPT, the services provided on the Reservation have two limiting factors: budget and bad roads. Road improvements are recommended throughout this Plan, and after completion may enable RCPT to access potential transit users who are currently unreachable.

There are several transit grant opportunities offered by the Federal Transit Administration (FTA) that have the potential to increase the budget allocated to RCPT. It is recommended that the Tribe apply for new grants listed below and continue to apply to any from which they currently receive funding:

- Access and Mobility Partnership Grants - This program provides competitive funding to support innovative capital projects for the transportation disadvantaged that will

improve the coordination of transportation services and non-emergency medical transportation services.

- Capital Investment Grants – 5309 - Provides funding through a multi-year competitive process for transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit. Federal transit law requires transit agencies seeking CIG funding to complete a series of steps over several years to be eligible for funding.
- Enhanced Mobility of Seniors & Individuals with Disabilities - Section 5310 - Formula funding to states for the purpose of assisting private nonprofit groups in meeting transportation needs of the elderly and persons with disabilities.
- Flexible Funding Programs - Congestion Mitigation and Air Quality Program - 23 USC 149 - CMAQ provides formula funding to areas in nonattainment or maintenance for ozone, carbon monoxide, and/or particulate matter. States that have no nonattainment or maintenance areas still receive a minimum apportionment of CMAQ funding for either air quality projects or other elements of flexible spending. Funds may be used for any transit capital expenditures otherwise eligible for FTA funding as long as they have an air quality benefit.
- Flexible Funding Programs - Surface Transportation Block Grant Program - 23 USC 133 - Provides formula funding that may be used by states and localities for a wide range of projects to preserve and improve the conditions and performance of surface transportation, including highway, transit, intercity bus, bicycle and pedestrian projects.
- Formula Grants for Rural Areas – 5311 - Provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations less than 50,000, where many residents often rely on public transit to reach their destinations.
- Grants for Buses and Bus Facilities Formula Program - 5339(a) - Provides formula funding to states and transit agencies through a statutory formula to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities. In addition to the formula allocation, this program includes two discretionary components: The Bus and Bus Facilities Discretionary Program and the Low or No Emissions Bus Discretionary Program.
- Grants for Buses and Bus Facilities Program - Provides funding through a competitive allocation process to states and transit agencies to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities. The competitive allocation provides funding for major improvements to bus transit systems that would not be achievable through formula allocations.
- Tribal Transit Formula Grants - 5311(c)(2)(B) - Provides funding to federally recognized Native American Tribes to provide public transportation services on and around Reservations or Tribal land in rural areas. Funding is provided as a set-aside within of the Formula Grants to Rural Areas program and allocated both by statutory formula and through a competitive discretionary program.

There are more applicable grants not listed above. Review the FTA website at *https://www.transit.dot.gov/grants* for a complete list. See "Chapter 7 – Project Funding" for more information about 5311 grants.

UTILITIES

Utility conditions play an important part in the maintenance of roads and in the cost of construction or reconstruction. When undertaking roadway improvements, it is essential that the age, condition, and capacity of utilities under the road be considered and addressed. This section describes the existing conditions of utilities on the Reservation and provides recommendations for improvements.

EXISTING CONDITIONS

During this LRTP process, efforts were made to gather information on the types, locations, and conditions of utilities within the Reservation. Much of this information is either unknown or has never been documented and mapped.

RECOMMENDATIONS

Although a formal review of street lighting was not undertaken as part of the LRTP, a need for improved lighting was observed in towns and subdivisions. A study should be undertaken to map existing lighting and identify types and locations of needed street lighting in Reservation communities. It is further recommended that the CRST conduct a utilities study and map the locations, particularly underground utility mains. This information is imperative when planning transportation improvements in communities where utilities are more likely to be impacted. This will also allow for planning utility repairs and upgrades to be performed concurrently with road projects.

Like roads, good utilities planning and a program for maintenance can help Tribal leaders to prepare for costly utility projects and to be alerted to utility costs that will accompany roadway improvement projects.

CHAPTER 6 - POLICY RECOMMENDATIONS

The purpose of this chapter is to identify recommended policies to support an efficient and safe future transportation system.

TRIBAL JURISDICTION OF STATE ROUTES

The SDDOT currently has jurisdiction over the following routes which cross through the Reservation:

- SD Highway 20
- SD Highway 34
- SD Highway 63
- SD Highway 65

The CRST wants jurisdiction of these routes transferred to the Tribe. This would enable the Tribe to use federal funds to maintain and repair the SD highways within Reservation boundaries. It may also, at some point in the future, allow for a larger Tribal share of federal funding to the CRST.

The Tribe may be setting a precedent with this endeavor. It would be expected that a change in jurisdiction of state-owned roads would require legislative action from the State of South Dakota, even if the SDDOT is amenable to the transfer of jurisdiction.

It is recommended that the Tribe obtain legal advice regarding the proceedings that would be involved in pursuing this goal.

HOUSING, SOCIAL AND ECONOMIC DEVELOPMENT PRIORITIES

Cheyenne River Housing Authority (CRHA) currently manages new housing and development on the Cheyenne River Indian Reservation. Future decisions regarding Tribal growth and locations for new housing will impact the Tribe's ability to maintain their existing transportation system.

If housing is expanded into new areas or new subdivisions are built, it will require extension of both utilities and roadway facilities.

However, if future housing development occurs adjacent to current roads and utilities, more funding resources will be available to maintain and upgrade the existing transportation system. This makes sense, as the cost of utilities and roads is generally less if current facilities can be expanded. Other amenities are also more feasible in expanded subdivisions and towns. Examples include schools, recreational facilities, retail establishments, and transit stops.

Examples of promising housing lot availability lies in and around many of the CRST towns and subdivisions. There are many vacant lots adjacent to quality roadways and near amenities such as medical services, schools, Tribal offices, and nearby transit services.

It is therefore recommended that current Tribal practices for location of new housing, housing rehabilitation, and other economic development be reviewed. Optimal locations for future housing and economic development should be identified, mapped, and promoted in locations adjacent to well-maintained transportation and utility corridors. Having optimal development locations mapped could improve and streamline the selection of better future development sites linked to available existing infrastructure.

The Cheyenne River Housing Authority has three planned housing projects:

- A 100-lot mobile home park which will be located adjacent to the Habitat for Humanity housing in Eagle Butte.
- A 6-plex single family housing building which will be in La Plant next to existing housing and the St. Paul Episcopal Cemetery.
- Eight one-bedroom single dwelling homes for the elderly will be constructed in the Badger Park Subdivision.

SYSTEM MANAGEMENT PRIORITIES

Given that funding is limited, some project needs should be delayed until higher priority needs are addressed. This section of the report suggests priorities for system management.

This transportation plan recommends that a strategic approach to Tribal priorities be established based on the following hierarchy of roadway needs:

Priority #1 – Complete emergency repairs and conduct normal maintenance and needed upgrades and/or repairs on existing bridges, culverts, and guardrails

Priority #2 – Address safety issues on arterial routes, followed by safety issues on other routes

Priority #3 - Correct gravel road surface and cross section/drainage deficiencies on primary routes

Priority #4 – Complete overlays and reconstruction on paved city and subdivision streets

Priority #5 – Complete overlays or reconstruction on paved BIA highways

Priority #6 - Correct road surface and cross section/drainage deficiencies on secondary and primitive roads

It is recommended that maintenance and needed upgrades of existing bridges, culverts, and guardrails, be given top priority over the rest of the transportation system. This will correct damages that were incurred after flooding in Spring 2019.

Paved roadways that are in fair to good condition should be set up on a rotational program of crack sealing, seal coats and/or non-structural overlays. According to FHWA TechBrief, Sealing and Filling Cracks in Asphalt Pavements, long-term crack sealing should be undertaken every 5-8 years on paved roads. Seal coats should be done every 7-10 years and non-structural overlays should be completed when needed, roughly every 15-20 or more years.

Because the preponderance of BIA and Tribal roads on the Reservation are gravel surface, maintenance of the gravel road system is important to the mobility, economic viability, safety, and quality of life of many of the CRST's residents. Maintenance of primary gravel roads has been ongoing and most of the rest of the earth, dirt, primitive, and gravel roads system only receives attention in cases of emergency. A study is recommended to identify secondary routes that should receive maintenance and to improve proactiveness, resulting in fewer emergency events.

Given that the CRST is years away from providing desired conditions of the current roadway system, it is inadvisable for them to use their funds for construction of new routes or for paving existing gravel roads. Use of funds for these projects would result in a further decline in surface conditions elsewhere within the Reservation. Ideally, any new routes or pavements completed as part of economic development or new housing should leave maintenance responsibility with the development or agency undertaking the project.

ROADWAY CROSS-SECTION STANDARDS

Roadway, path and sidewalk projects have used typical cross-sections, though no clear standards have been adopted. Cross-section standards should be adopted for future projects and should serve as guidance for future housing and development projects. It is recommended that these standards be used on all future projects. The proposed cross-sections are shown in Figures 6-1 through 6-7.

FIGURE 6-1 – Standard High-Speed BIA Paved Road Typical Section

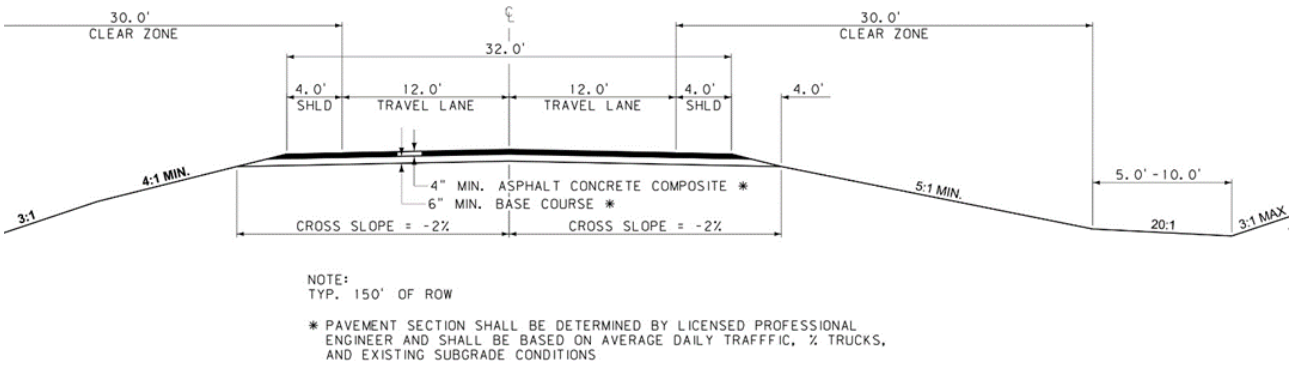


FIGURE 6-2 – Standard High-Speed Gravel Road Typical Section

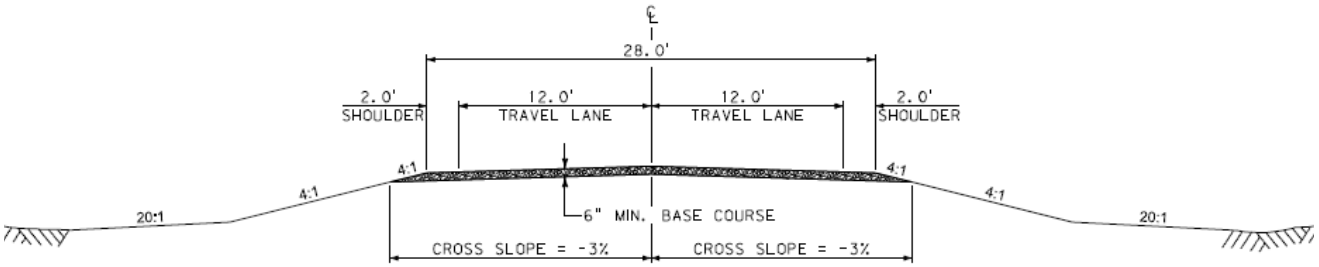


FIGURE 6-3 – Standard Low Speed Gravel Road Typical Section

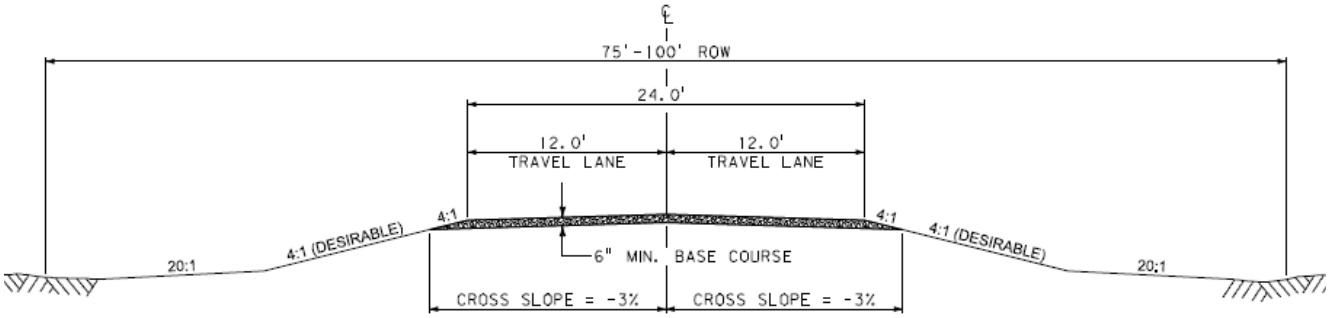
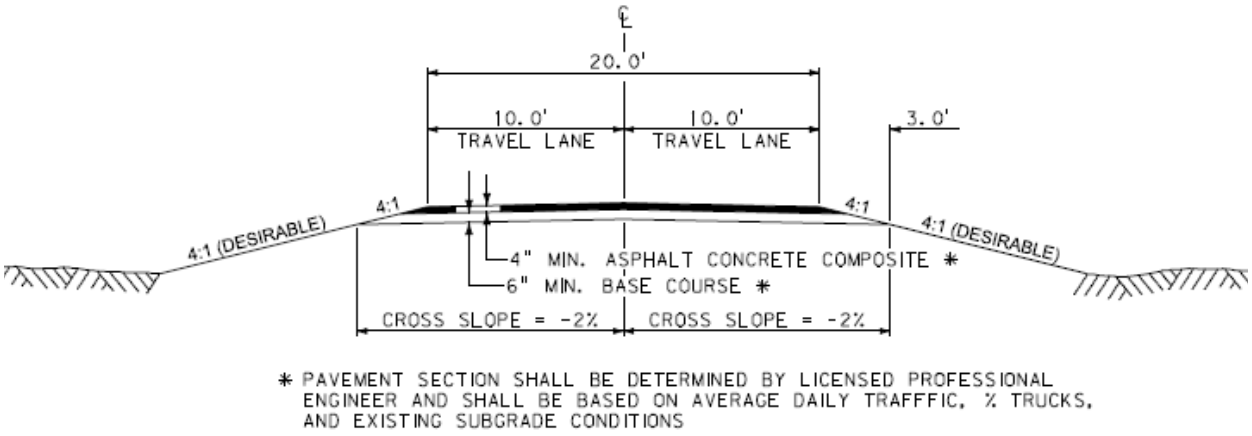
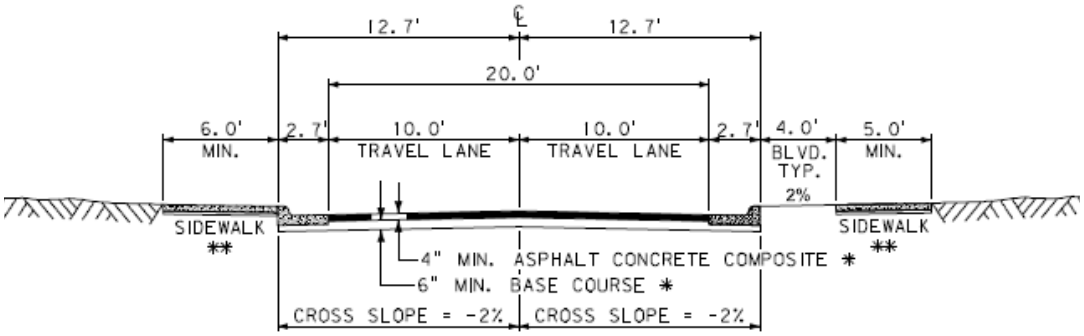


FIGURE 6-4 - Standard Tribal Housing & Residential Street Typical Section - Rural



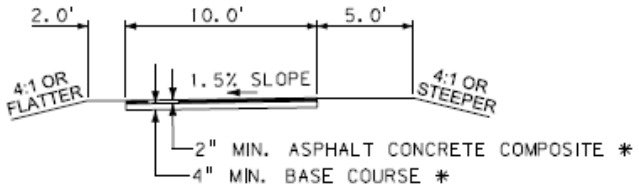
* PAVEMENT SECTION SHALL BE DETERMINED BY LICENSED PROFESSIONAL ENGINEER AND SHALL BE BASED ON AVERAGE DAILY TRAFFFIC, % TRUCKS, AND EXISTING SUBGRADE CONDITIONS

FIGURE 6-5 - Standard Tribal Housing & Residential Street Typical Section - Urban



* PAVEMENT SECTION SHALL BE DETERMINED BY LICENSED PROFESSIONAL ENGINEER AND SHALL BE BASED ON AVERAGE DAILY TRAFFFIC, % TRUCKS, AND EXISTING SUBGRADE CONDITIONS

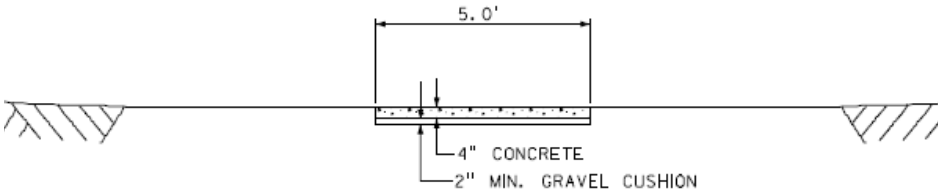
FIGURE 6-6 - Standard Separated Shared Use Path Typical Section



NOTE:
2" MIN. ASPHALT CONCRETE COMPOSTIE OVER 4" MIN. BASE COURSE
OR
4" MIN. CONCRETE OVER 2" MIN. GRAVEL CUSHION

* PAVEMENT SECTION SHALL BE DETERMINED BY LICENSED PROFESSIONAL ENGINEER AND SHALL BE BASED ON AVERAGE DAILY TRAFFFIC, % TRUCKS, AND EXISTING SUBGRADE CONDITIONS

FIGURE 6-7 – Standard Sidewalk Typical Section



DEVELOPMENT REVIEW

Future development proposals have the potential for impacts on the CRST transportation system. It is recommended that future development proposals be submitted to CRST Transportation for review and comment before approval. This will increase Tribal leaders' information and their ability to make the best decisions pertaining to development on the Reservation and potential impacts to the transportation system.

ENVIRONMENTAL CONSIDERATIONS

The primary environmental impacts associated with the existing transportation system include erosion, wild animal hits by automobiles, and dust-related impacts on air quality. These also are considerations associated with future transportation improvement projects, as well as impacts to undeveloped land and wetlands.

The CRST is encouraged to consider and mitigate these impacts as is customary in future projects, and to apply for and take full advantage of grants and additional funding that can be applied to address these issues. Current practices to mow ditches are a useful method to improve visibility resulting in fewer wild animal hits, which is the top cause for crashes on the Reservation. Where appropriate, fencing should also be considered to further reduce interaction with wild animals and livestock.

CULTURAL CONSIDERATIONS

The Cheyenne River Indian Reservation retains bountiful history and heritage within its borders. There are many cultural resources that require access at various times throughout the year, including many Powwow and Sun Dance grounds, cemeteries, and unique historical sites. During the LRTP process it was noted that in many Cheyenne River communities there are no pedestrian facilities leading to Powwow or Sun Dance grounds.

Recommendations have been made for sidewalks or shared use paths in the communities currently lacking a pedestrian facility to these important cultural locations. In the future, if access roads to cultural sites become degraded or unsafe, priority should be given to those sites that need road improvements, sidewalks, or shoulder widening.

ENERGY CONSERVATION CONSIDERATIONS

The CRST has been using Light-Emitting Diode (LED) lighting for locations accessible to electric utilities. There is also solar lighting along the shared use path in Eagle Butte leading to the Fox Ridge housing development.

Given the higher maintenance cost for solar batteries and colder weather impacts on performance, solar lighting should be installed with discretion until the cost and performance of solar batteries is equal or better than that for LED lighting. Anecdotally, there was a storm in September 2019 that knocked out all the power in Eagle Butte; the solar lighting along the shared use path was the only light source still working.

Energy conservation can also be realized through improvements to roads that can serve as effective short cuts to other, longer routes.

Energy is conserved when people choose non-motorized transportation as their mode of travel. This plan provides alternatives to improve facilities for walking, biking, and transit. It is anticipated that as these facilities are improved, alternative mode choice will increase over time.

CHAPTER 7 - PROJECT FUNDING

State highways on the Reservation are currently funded and maintained by the SDDOT. There are multiple funding sources available for roads, bridges, sidewalks, paths, and transit which are not on the state highway system. It is possible that more of these funding sources can be tapped if a greater emphasis is placed on applying for these funds. These funding sources are discussed in the following sections.

TRIBAL TRANSPORTATION PROGRAM FUNDS

The Tribal Transportation Program (TTP) is the primary source of Tribal transportation funding. It is estimated that the CRST will be allocated roughly $2.4 million annually, or roughly 90% of total Tribal transportation funding over the next few years. The purpose of the TTP is to enhance the quality of life in Indian country by providing access to basic community services. The TTP replaces the former Indian Reservation Roads (IRR) program. Prior to distribution to Tribes, the following amounts may be deducted from the overall federal program:

- Up to 6% for program administration, including funding for Tribal Technical Assistance Centers (TTAPs). These funds may be used by the Secretary or the Secretary of the Interior for program management and oversight and project-related administrative expenses.
- Up to 2% per year for transportation planning, to be allocated among Indian Tribal governments that apply for transportation planning.
- Up to 2% per year for a nationwide priority program for improving eligible deficient bridges.
- Up to 2% per year for safety projects, to be allocated to applicant Tribal governments for eligible projects.

Unless additional funding resources can be tapped, funding for transportation improvements is limited to those resources identified in the CRST TTIP.

TRIBAL TRANSPORTATION PROGRAM SAFETY FUNDS

The TTPSF program has established funding goals for safety planning and engineering improvements. Funds are available to federally recognized Indian Tribes through a competitive, discretionary program. Awarded annually, projects are chosen based on outcomes that will address the prevention and reduction of deaths or serious injuries in transportation related crashes. Safety funds support safety projects, studies, safety audits, and other title 23-eligible safety activities. The CRST has received the following grants administered by the TTPSF:

Project	Amount	Year Awarded
Transportation Safety Education Program	$ 39,200.00	2015
Cheyenne River Eagle Butte Pathway Lighting Project	$ 268,800.00	2015

It is recommended that the CRST continue to apply for TTPSF funding to address transportation safety issues on the Reservation. The success of these applications can be increased if location-specific crash data is collected with a higher level of detail. Implementation of an electronic crash records system will provide the supporting evidence needed to justify project funds.

TRIBAL BRIDGE PROGRAM FUNDS

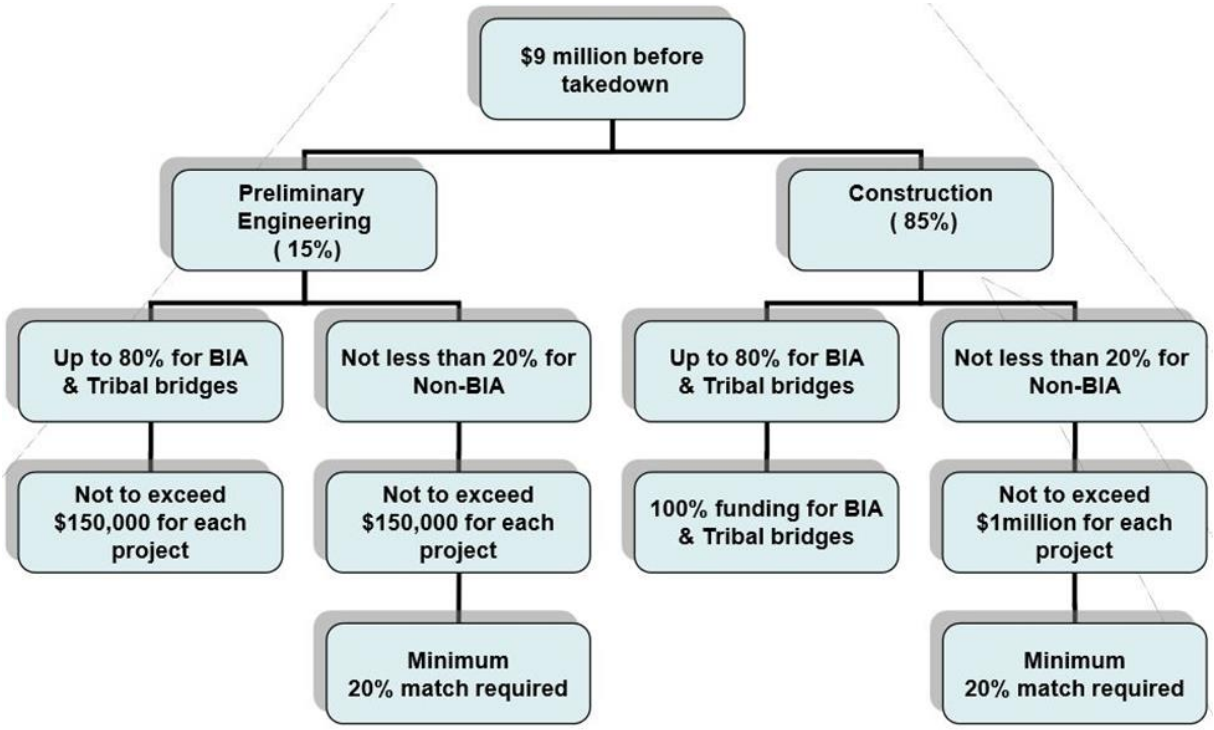
Applications for bridge project funding can be submitted under the Tribal Transportation Bridge Program (TTBP). All projects are ranked and prioritized based on the following criteria:

- Bridge sufficiency rating (SR)
- Bridge status with structurally deficient (SD) having precedence over functionally obsolete (FO)
- Bridges on school bus routes
- Detour length
- Average daily traffic
- Truck average daily traffic

TTBP funds may be used for planning, design, engineering, preconstruction, construction, and inspection of a project to replace, rehabilitate, seismically retrofit, paint, or for anti-icing and deicing, or to implement any countermeasures (including multiple-pipe culverts) for eligible Tribal transportation facility bridges.

The FAST Act requires inspection of all public bridges including Tribal bridges be performed at least every 2 years, and the data reported into the FHWA National Bridge Inventory. To be eligible for funding, a bridge must have at least a 20 feet opening, be classified as a Tribal transportation facility, and be structurally deficient or functionally obsolete. On a national level, annual Tribal bridge program funding that the CRST can compete for is shown in Figure 7-1.

FIGURE 7-1 – Annual Tribal Bridge Program Funding



CRST TRIBAL EQUITABLE COMPENSATON ACT (TECA) FUND

The CRST TECA fund provides grant monies for projects and programs in three funding categories: (1) economic development, (2) infrastructure development, and (3) educational, health, recreational, and social welfare objectives, with the goal of raising the quality of life for Tribal members.

The CRST DOT is eligible under Category 2 to receive funding for projects and programs that improve Tribal members' access to essential services. Eligible entities to receive grants under Category 2 are (1) any Tribal Department or program that provides essential governmental services to members of the Tribe and (2) any of the 21 Tribal communities on the Reservation.

Allowable project/program types include, but are not limited to:

- Road construction and/or maintenance
- Land purchases and leases
- Essential facilities such as community buildings and storm shelters
- Projects or services that improve tribal members' access to essential services such as potable water, electricity or other energy sources, police and fire protection, court

services, telephone and other electronic-based communications, sewer systems, and waste removal
- Recycling facilities, green-alternatives to wastewater management
- Alternative/Green energy development.

Grants are awarded through a competitive process. Applications that include construction cost estimates, proof of secured property, infrastructural assessments, and architecture and engineering plans/specifications will gain more points in scoring. If no planning has been completed, it is possible to request funding for just the planning portion of construction prior to submitting an application for construction funding. Before grants are awarded for the construction of any structure or facility including roads, the receiving entity must agree to operate and maintain the facility in perpetuity and must also demonstrate from where the O&M funding will be allocated; TECA funds may not be used.

The infrastructure development fund was appropriated $1M for Funding Window 2 of the 2019 calendar year, with a ceiling amount of $500,000 for each project submitted.

NATIONALLY SIGNIFICANT FEDERAL LANDS AND TRIBAL PROJECTS (NSFLTP)

Administered by the USDOT, FHA, this funding opportunity was established by the FAST Act and provides Federal funding to projects of national significance for construction, reconstruction, or rehabilitation of transportation facilities within, adjacent to, or providing access to Federal or Tribal lands. The Secretary of Transportation may award up to $300M. Eligible projects must have an estimated construction cost of at least $25M, with projects equal to or exceeding $50M receiving priority consideration in the selection process. There are other requirements that must be met, and eligible applicants are:

- Tribe
- Federal Land Management Agency (FMLA)
- If sponsored by a FMLA or Tribe, the following applicant types can apply:
    - State
    - Local
    - Transit agencies
    - Port authorities
    - Metropolitan planning organizations
    - Other political subdivisions of State or local governments

TRIBAL TRANSIT PROGRAM FUNDS0

Per the SDDOT website, the Federal Transit Administration (FTA) Section 5311 Program authorizes capital, administrative, operating assistance and training grants to state agencies, local governments, Indian Tribes, and nonprofit organizations providing rural public transportation services.

All projects must benefit residents in non-urbanized areas (under 50,000 population) of South Dakota. Section 5311 provides up to 80% federal share of the costs for administrative expenses, up to 80% for capital costs and up to 50% of the net operating deficit for rural transit operations.

Coordinated community transit systems serving both the rural public and human service agencies are preferred applicants for Section 5311 grants.

The Rural Technical Assistance Program (RTAP) available under Section 5311 provides grants for training at 100% federal share. Eligible subgrantees for RTAP training grants include administrative and operating personnel providing rural transit services to areas in South Dakota.

SDDOT TRANSPORTATION ALTERNATIVES

Transportation Alternatives (TA) is authorized by the Fixing America's Surface Transportation Act (FAST Act) which provides funding for a variety of alternative transportation projects, including many that were previously eligible under separately funded programs. TA replaces the Transportation Alternatives Program (TAP), and the set-aside funds include projects approved under previous programs authorized under MAP-21: Scenic Byways, Recreational Trails, Safe Routes to School, and other discretionary programs. The Federal share for these projects is 81.95%, with the non-Federal share covered by the responsible jurisdiction. The award maximum is $400,000, with a minimum amount for infrastructure projects of $50,000. There is no minimum amount for non-infrastructure projects.

Eligible categories include:

- On-road and off-road trail facilities for pedestrians and bicyclists, including ADA improvements, traffic calming techniques, lighting, and other safety-related infrastructure
- Preservation and rehabilitation of historic transportation facilities
- Archeological activities relating to impacts for a transportation project
- Any environmental mitigation activity, including prevention and abatement to address highway related stormwater runoff and to reduce vehicle/animal collisions including habitat connectivity
- Turnouts, overlooks, and viewing areas
- Conversion/use of abandoned railroad corridors for trails for non-motorized users
- Inventory, control, and removal of outdoor advertising
- Vegetation management in transportation right of way for safety, erosion control, and controlling invasive species

- Construction, maintenance, and restoration of trails and development and rehabilitation of trailside and trailhead facilities*
- Development and dissemination of publications and operation of trail safety and trail environmental protection programs
- Educations funds for publications, monitoring, and patrol programs and for trail-related training
- Planning, design, and construction of projects that will substantially improve the ability of students to walk and bicycle to school
- Non-infrastructure-related activities to encourage walking and bicycling to school, including public awareness campaigns, outreach to press and community leaders, traffic education and enforcement school vicinities, student sessions on bicycle and pedestrian safety, health, and environment, and funding for training

The CRST has received three TA grants for shared use paths and lighting in Eagle Butte.

* The Recreational Trails Program under section 206 of title 23 is funded under TA but administered by the South Dakota Department of Game, Fish and Parks.

BUILD GRANTS

The Department of Transportation provides funding through the Better Utilizing Investments to Leverage Development (BUILD) program. The funds are awarded on a competitive basis for capital investments in transportation projects that will have a significant local or regional impact.

The April 2018 release of the new BUILD program made available $1.5 billion in discretionary funding to support roads, bridges, transit, rail, ports or intermodal transportation. Not less than 30 percent (or $450 million) of the funds provided shall be used for projects located in rural areas. Additionally, the FY2018 Appropriations Act allows for up to $15 million to be awarded as grants for the planning, preparation or design of eligible projects, known as BUILD Transportation Planning Grants.

Changes in the BUILD program for FY2019 include:

- Federally owned facilities, including those owned by the BIA, National Park Service, and General Services Administration, are not eligible for BUILD funds.
- The designation for rural and urban projects differs from previous rounds.
- $900 million was dispersed through BUILD grants, split equally between urban and rural projects.

Projects for BUILD will be evaluated based on merit criteria that include safety, economic competitiveness, quality of life, environmental protection, state of good repair, innovation,

partnership, and additional non-Federal revenue for future transportation infrastructure investments.

Competition for BUILD grants is anticipated to be very high, and the right project, a strong strategy and supporting local funding is needed for grant applications to have a reasonable chance at being approved. While a successful grant application can prove challenging, the rewards of a successful grant application is generally a project of significant value.

FEDERAL TRANSIT ADMINISTRATION (FTA) TRIBAL TRANSIT GRANTS

The FAST Act authorizes the Public Transportation on Indian Reservations Program (Tribal Transit Program (TTP) for Fiscal Years 2016-2020. This program consists of a $30 million formula program and a $5 million competitive grant program subject to the availability of appropriations.

A 10-percent local match is required under the competitive program, however, there is no local match required under the formula program. This program is available to federally recognized Tribes that are eligible recipients under the Tribal Transit Program. Funding may be used for capital, operating, planning, and administrative expenses for public transit projects that meet the growing needs of rural Tribal communities.

SD TRANSPORTATION ECONOMIC DEVELOPMENT PROGRAMS

The South Dakota Department of Transportation administers a grant program to foster economic development and enhance community access in South Dakota. The program has three categorical purposes, each category providing for 60 percent of construction costs of the project, not including engineering or utility work. The grant size under each program is limited to $400,000.

Industrial Park grants will be made to any local unit of government for the development of new or expanded access for new industry located within industrial parks. Applications are due April 15, July 15, or October 15.

Agri-Business grants will be made to any local unit of government for the development of new or expanded agri-business industries. Applications are due April 15, July 15, or October 15.

Community Access Grants are state funds for towns less than 5,000 in population and are for the construction or reconstruction of major streets in each town such as Main Street, the road to the elevator, schools, hospitals, etc. Applications are due July 15.

FEDERAL AVIATION ADMINISTRATION AIRPORT IMPROVEMENT PROGRAM

The Airport Improvement Program (AIP) provides grants to public agencies — and, in some cases, to private owners and entities — for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS).

For large and medium primary hub airports, the grant covers 75 percent of eligible costs (or 80 percent for noise program implementation). For small primary, reliever, and general aviation

airports, the grant covers a range of 90-95 percent of eligible costs, based on statutory requirements.

AIP grants for planning, development, or noise compatibility projects are at or associated with individual public-use airports (including heliports and seaplane bases). A public-use airport is an airport open to the public that also meets the following criteria:

- Publicly owned
- Privately owned but designated by FAA as a reliever
- Privately owned but having scheduled service and at least 2,500 annual enplanements.

Further, to be eligible for a grant, an airport must be included in the NPIAS. The NPIAS, which is prepared and published every 2 years, identifies public-use airports that are important to public transportation and contribute to the needs of civil aviation, national defense, and the Postal service.

The description of eligible grant activities is described in the authorizing legislation and relates to capital items serving to develop and improve the airport in areas of safety, capacity, and noise compatibility. In addition to these basic principles, an awardee must be legally, financially, and otherwise able to carry out the assurances and obligations contained in the project application and grant agreement.

Eligible projects include those improvements related to enhancing airport safety, capacity, security, and environmental concerns. In general, sponsors can get AIP funds for most airfield capital improvements or rehabilitation projects and in some specific situations, for terminals, hangars, and nonaviation development. Certain professional services that are necessary for eligible projects (such as planning, surveying, and design) can also be eligible. The FAA must be able to determine that the projects are justified based on civil aeronautical demand. The projects must also meet Federal environmental and procurement requirements.

The following requirements must also be met for FAA to consider a project for AIP funding:

- The project sponsorship requirements have been met.
- The project is reasonably consistent with the plans of planning agencies for the development of the area in which the airport is located.
- Sufficient funds are available for the portion of the project not paid for by the Federal Government.
- The project will be completed without undue delay.
- The airport location is included in the current version of the NPIAS.
- The project involves more than $25,000 in AIP funds.
- The project is depicted on a current airport layout plan approved by FAA.

Figure 7-2 lists examples of typical eligible and ineligible AIP Projects.

Figure 7-2 - Examples of Eligible and Ineligible AIP Projects

Examples of Eligible Versus Ineligible AIP Projects	
Eligible Projects	Ineligible Projects
Runway construction/rehabilitation	Maintenance equipment and vehicles
Taxiway construction/rehabilitation	Office and office equipment
Apron construction/rehabilitation	Fuel farms*
Airfield lighting	Landscaping
Airfield signage	Artworks
Airfield drainage	Aircraft hangars*
Land acquisition	Industrial park development
Weather observation stations (AWOS)	Marketing plans
NAVAIDs such as REILs and PAPIs	Training
Planning studies	Improvements for commercial enterprises
Environmental studies	Maintenance or repairs of buildings
Safety area improvements	
Airport layout plans (ALPs)	
Access roads only located on airport property	
Removing, lowering, moving, marking, and lighting hazards	
Glycol Recovery Trucks/Glycol Vacuum Trucks	

*May be conditionally eligible at non-primary airports.

For complete information about the AIP, view the website at *www.faa.gov/airports/aip*.

The Cheyenne Eagle Butte Airport has received six AIP grants since 2010 as listed in Figure 7-3.

Figure 7-3 - CRST AIP Grants Received 2010-2018

Year	Amount	Project
2010	$36,100.00	Install Perimeter Fencing [Design for Wildlife Fence]
2010	$69,350.00	Update Airport Master Plan Study [Update Airport Layout Plan]
2011	$499,130.00	Install Miscellaneous NAVAIDS, Install Perimeter Fencing
2017	$72,000.00	Expand Apron, Reconstruct Apron
2018	$309,000.00	Expand Apron - Phase 2 construction - 2,500 Square Yards new apron
2018	$525,000.00	Reconstruct Apron - Reconstruct Phase 2 Reconstruct 5,000 Square Yards existing apron.

LOCAL FEES AND TAXES

The CRST has very limited resources for raising local funds. Some items that may be considered include assessing a wheel tax on vendors, fines for overweight vehicles, and fees associated with haul road agreements. The success of any of these options is contingent on Tribal lawyers drafting the regulations and laws required and Tribal courts providing needed enforcement.

The CRST does assess a tax on motor fuel with the purpose of funding government services and transportation infrastructure. Monies collected are deposited into a general fund. It is recommended that Tribal Council consider that of a portion of motor fuel taxes collected be allocated directly to the CRST DOT to fund transportation infrastructure projects.

RECOMMENDED FUNDING STRATEGY

Until an inventory of pavement conditions and a pavement management plan is prepared, it is difficult to know the extent of transportation improvement needs, both now and heading into the future. It is reasonable to anticipate that the needs will be greater than funding that is available. The federal register requires analysis of funding alternatives.

Keeping this in mind, it is more important than ever that the CRST wisely spend the limited funds that are received and make necessary efforts to leverage additional funds from competitive funding programs.

Figure 7-4 provides a general guide for project types and funding mechanisms. It should be consulted yearly to determine potential projects that fit within competitive programs. When projects are identified, the Tribe should determine the appropriate timing to initiate funding applications.

FIGURE 7-4 – Funding Mechanisms by Project Type

Funding Program	Acronym	Funding Mechanism	Typical Project Type
Tribal Transportation Program Funds	TTP	Allocation	Roads
Tribal Safety Funds	TTPSF	Application	Studies, guardrail, hazard reduction
Tribal Bridge Program Funds	TTBP	Application	Bridges
Tribal Equitable Compensation Act	TECA	Application	Road construction and improvement, hazard reduction
Transportation Alternatives Funding	TA	Application	Sidewalks and shared use paths, lighting
Better Utilizing Investments to Leverage Development Funds	BUILD	Application	Variety, tied to economic development
Congestion Mitigation and Air Quality Funds	CMAQ	Application	Maintenance equipment
Federal Transit Administration	FTA	Application	Transit buses, transit shelters
Federal Aviation Administration Airport Improvement Program	AIP	Application	Airport improvements
Nationally Significant Federal Lands and Tribal Projects	NSFLTP	Application	Highways, roads, bridges, trails, transit on or adjacent to Tribal or Federal land

Strategic decisions on where to use available funds must recognize that use of funds to address one need often impacts the ability to resolve another need. Figure 7-5 shows annual averages of available and used funding from the 2020-2024 TTIP.

Figure 7-5 also shows the balance of funding applied to new construction and reconstruction, major rehabilitation, pavement preservation and maintenance. This table is intended to serve as a guide, so that when, for example, decisions are made to spend more on one type of project, additional decisions are needed to spend less on another type of project. Alternative funding covering bike paths, bridges and transit are not shown as these will generally be dependent upon success in submitting applications and competition against other submittals.

FIGURE 7-5 - Annual Tribal Program Funding

Available Funds (With Estimated Grants)	Annual Average
Est. TTP Formula Funds	$2,200,000.00
Est. Carry Over	
Other Est. Annual Funds	$1,020,000.00
Total	**$3,220,000.00**

Funding Use	Annual Average
Planning and Design	$ 86,400.00
Transit	$ 10,000.00
Maintenance*:	$ 575,000.00
Total	**$ 671,400.00**

Other Est. Annual Funds	
TTP Safety Funds	$0.00
TTP Bridge Funds	$0.00
TA Funds	$20,000.00
BUILD Grants	$0.00
TECA	$1,000,000.00
	$1,020,000.00
Available Funds	$3,220,000.00
Funding Use	-$671,400.00
Total Remaining Funds**	**$2,548,600.00**

*Maintenance Activity	Cost/Mile	Priority Miles	Miles/Year	
Patching (6" depth)	$1,500.00	60	1	$1,500.00
Gravel Blading & Maintenance	$5,000.00	118	56	$280,000.00
Conversion of Primitive to Gravel	$82,000.00	20	1.5	$123,000.00
Multi-Route Pavement Striping	$2,000.00	60	20	$40,000.00
Bridge and Culvert Maintenance	$26,000.00	1 LS	1.5	$39,000.00
Equipment Acquisition and Repairs	$150,000.00	1 LS	0.5	$75,000.00
Dust Control	$8,000.00	0	0	$0.00
Snow Fence Installation (per Linear Foot)	$12.00	5	0.25	$15,840.00
	***Example expenditures of maintenance funds:**		**Total**	**$574,340.00**

New Construction and Reconstruction	Cost/Mile	Priority Miles	Miles/Year	Annual Cost
Street Construction/Reconstruction	$1,700,000.00	1	0.1	$170,000.00
Lighting (TA Match)	$300,000.00	3	0.1	$30,000.00
Sidewalks (TA Match)	$200,000.00	3	0.1	$20,000.00
Shared Use Paths (TA Match)	$300,000.00	7	0.1	$30,000.00
			Subtotal	$250,000.00
Major Rehabilitation				
Major Surface Rehabilitation	$750,000.00	10	1	$750,000.00
Gravel Rehabilitation	$150,000.00	4	1	$150,000.00
			Subtotal	$900,000.00
Pavement Preservation				
Chip Seal	$32,500.00	60	8	$260,000.00
Crack filling and sealing	$2,000.00	60	10	$20,000.00
4-Inch Structural Overlay	$500,000.00	15	1	$500,000.00
1-1/2 Inch Non-Structural Overlay	$300,000.00	15	2	$600,000.00
			Subtotal	$1,380,000.00
	****Example expenditures of TTIP funds:**		**Project Improvements**	**$2,530,000.00**

CHAPTER 8 - PROJECT PRIORITIZATION PLAN

Projects were prioritized in line with available funding, anticipated success in applying for competitive funding, proposed policies and identified project needs.

State highway improvements will be implemented based upon state and federal funding availability and based upon their own prioritization methodology. Project prioritization may vary based upon other infrastructure needs. For example, if a major water main is to be installed under a roadway, it is more cost effective to improve this roadway in combination with the underground utility improvements rather than restoring the road and improving it in subsequent years. At the time this report was completed, a utility implementation strategy was unavailable.

SHORT AND LONG RANGE PROJECT RECOMMENDATIONS

Short range projects are those anticipated to be started by the end of the year 2024. The short range projects listed in the Tribe's TTIP must be financially constrained to fit within the amount of TTP funds allocated to the Tribe each fiscal year. It is expected that the Tribe will receive about $2,200,000 annually from which a general Tribal maintenance fund receives 25%, or $575,000.00, leaving about $1,600,000.00 for construction.

To maintain the Tribe's economic sustainability, funding must be carefully distributed to the most critical locations. Proposed short range projects are listed in Figure 8-1. Projects for which other funding sources are anticipated (FEMA, ERFO, TECA) are noted. When additional funding is received the Tribe will be able to prioritize a long range project to move into the short range element of the LRTP.

FIGURE 8-1 – Short Range Projects and Funding

Project Description	Est. Project Cost	Year Constructed	FY2021	FY2022	FY2023	FY2024	FY2025
Pavement Marking/Striping	$25,000.00		$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00
General Tribal Maintenance 25% of TTP			$575,000.00	$575,000.00	$575,000.00	$575,000.00	$575,000.00
ERFO (not TTP money)(planning)	$650,000.00						
ERFO (not TTP money)(Construction)	$5,085,000.00	2021-2022	$100,000.00				
FEMA 4440 Construction	$750,000.00	2021	$441,000.00				
FEMA 4463 Construction	$1,559,000.00	2021	$0.00				
FEMA 4467 Construction	$2,345,000.00	2021	$8,000.00				
Long Range Transportation Plan & Inventory Update			$92,000.00				
BIA Rt 6 Cherry Creek Slide Area (Match)(NRCS Design)		2022	$500,000.00				
BIA 3 Moreau River Road Encroachment (Match)(NRCS Desi	$750,000.00	2022		$750,000.00			
BIA Rt 8 Resurfacing US 212 to Willow Creek 13.6 mi	$1,200,000.00	2022	$942,000.00	$258,000.00			
BIA Rt 12 Rehabilitation	$6,500,000.00	2026		$2,455,398.70	$677,000.00	$1,600,000.00	$1,600,000.00
Badger Park Pedestrian Pathway (TA Program Match)	$973,000.00	2023			$573,000.00		
LaPlante Pedestrian Pathway (TA Program Match)	$750,000.00	2023			$350,000.00		
BIA Rt 3 Resurfacing (construction)	$3,501,000.00						
Multi Route Gravel 3 & 7	$1,427,000.00						
White Horse Community Streets	$450,000.00						
BIA Rt 11 (Takini West) Design	$190,000.00						
BIA Rt 11 (Takini West)	$2,100,000.00						
Willow St., Eagle Butte							
Takini Housing							
Total Budgeted			**$2,683,000.00**	$4,063,398.70	$2,200,000.00	$2,200,000.00	$2,200,000.00

Long range projects are those anticipated to be started after the year 2024. While many of these projects are desired sooner, funding limitations indicate that it may not be possible to complete them during the short range element of the plan. Some of these projects may become short range projects if the Tribe is able to pull from alternative funding sources described earlier. Long range projects are shown in Figures 8-2 through 8-11.

Figure 8-2 – Long Range Projects and Costs - Part 1

Project #	Project Title	Project Location	Project Description	Estimated Cost
9	BIA 6 Cherry Creek Slide	0.5 mi N of Cherry Creek, Ziebach Co	Scour protection and bank stabilization	$2,000,000.00
10	Tribal Route 8509 Gravel Construction	S from BIA 8, Dewey Co	Upgrade earth road to gravel	$960,000.00
11	BIA 11 Takini West Resurfacing	Takini School to SD34	Stabilized road base with double chip seal and blotter coat	$2,100,000.00
12	BIA 11 Takini East Resurfacing	BIA 11, Takini School to Cherry Creek, Ziebach Co	Stabilized road base with double chip seal and blotter coat	$5,610,000.00
13	BIA 17 Proposed Road	LaPlant to Promise, Dewey Co	New gravel road construction	$1,176,000.00
14	BIA 7 No Mouth Creek Bridge Replacement	BIA 7, S of Blackfoot, Dewey Co	Bridge Replacement	$1,000,000.00
15	BIA 7 Virgin Creek Bridge Replacement	BIA 7, E of Promise, Dewey Co	Bridge Replacement	$1,500,000.00
16	BIA 7 Moreau River Bridge Replacement	BIA 7, north of Promise, Dewey Co	Bridge Replacement	$4,180,000.00
17	BIA 3 Pavement Preservation	US212 to Moreau River, Dewey Co	Full and partial reconstruction	$13,170,000.00
18	BIA 2 Culvert Assessment and Scour Protection	3 locations between SD63 and Whitehorse Rd, Dewey Co	Culvert replacement and scour protection	$1,607,390.00
19	BIA 2 Resurfacing	BIA 2, Dewey County	Stabilized road base with double chip seal and blotter coat	$5,520,000.00
20	BIA 2 Moreau River Encroachment	4 mi E of SD63, Dewey Co	Scour protection and bank stabilization	$371,000.00
21	Pavement Preservation - Crack Seal	Community streets in Eagle Butte, Cheyenne River IHS Center, Habitat for Humanity housing, Thunder Butte	2.3 miles crack sealing	$55,170.00
22	Pavement Preservation - Crack and Chip Seal	Community streets in Bear Creek, Cherry Creek, Eagle Butte, Dupree, Fox Ridge Housing, Habitat for Humanity housing, Iron lightning, No Heart housing, Timber Lake	15.6 miles crack and chip sealing	$338,550.00
23	Pavement Preservation - Nonstructural Overlay - West	Community streets in Bear Creek, Bridger, Cherry Creek, Dupree, Takini	1.9 miles nonstructural overlay	$567,150.00
24	Pavement Preservation - Nonstructural Overlay - East	Community streets in Eagle Butte, Green Grass, Habitat for Humanity housing, LaPlant, No Heart housing, Timber Lake, Whitehorse, one mile of BIA 14	5.2 miles nonstructural overlay	$1,564,320.00
25	Pavement Preservation - Structural Overlay - West	Community streets in Bear Creek, Bridger, Cherry Creek	1.8 miles structural overlay	$921,500.00
			Subtotal	$42,641,080.00

FIGURE 8-3 – Long Range Projects and Costs - Part 2

Project #	Project Title	Project Location	Project Description	Estimated Cost
26	Pavement Preservation - Structural Overlay - East	Community streets in Eagle Butte, Green Grass, Habitat for Humanity housing, LaPlant, No Heart housing, Timber Lake, Whitehorse, one mile of BIA 14	2.7 miles structural overlay	$1,366,380.00
27	Pavement Preservation - Structural Overlay w/Digouts	Community streets in Cherry Creek, Eagle Butte, Swiftbird, Whitehorse, one mile of BIA 14	2.7 miles structural overlay w/digouts	$1,512,130.00
28	Pavement Preservation - Partial Reconstruction	Community streets in Cherry Creek, Eagle Butte, Swiftbird, Takini, and Whitehorse	1.1 miles partial reconstruction	$1,711,650.00
29	Pavement Preservation - Full Reconstruction	Community streets in Swiftbird; BIA 7 north of the Moreau River bridge	1.8 miles full reconstruction	$3,514,070.00
30	Sidewalks Condition Survey	Reservation wide	Assessment, GIS mapping	$12,500.00
31	New Tribal Housing Streets	Reservation wide	Paved construction, 1 mile	$1,750,000.00
31.1	New Tribal Housing Streets	Reservation wide	Gravel construction w/drainage, 1 mile	$200,000.00
32	Inventory Updates	Reservation wide	Surveying, GIS, administrative	$35,000.00
33	NTTFI Route 7061	Eagle Butte S of 2nd Airport Rd, Ziebach Co	Curve flattening and safety updates	$1,172,500.00
34	BIA 6 Resurfacing	BIA 6, Ziebach County	Stabilized road base with double chip seal and blotter coat	$9,600,000.00
35	BIA 13 Resurfacing	BIA 13, Ziebach County	Stabilized road base with double chip seal and blotter coat	$2,610,000.00
36	BIA 14 Resurfacing	BIA 15, Ziebach County	Stabilized road base with double chip seal and blotter coat	$1,410,000.00
37	County Rd 9015 Resurfacing	Between BIA 2 and Whitehorse, Dewey Co	Stabilized road base with double chip seal and blotter coat	$510,000.00
38	County Rd 10 Reconstruction	North of BIA 3/BIA 7 junction, Dewey Co	Asphalt reconstruction, BUILD/TIGER grant application, funding coordination	$13,650,000.00
39	BIA 19 Resurfacing	BIA 19, Dewey Co	Stabilized road base with double chip seal and blotter coat	$1,560,000.00
40	BIA 8 Resurfacing	Between BIA 19 and Rte 8509, Dewey Co	Stabilized road base with double chip seal and blotter coat	$6,360,000.00
41	BIA 803	BIA 803, Dewey Co	Gravel Resurfacing and Gravel Construction	$795,000.00
42	New Tribal Transportation Facility	Eagle Butte, Co undetermined	New facility construction, parking lot access	$3,500,000.00
43	Eagle Butte Tribal Daycare New Road and Parking Lot	Eagle Butte, Dewey Co	New road and parking lot	$275,000.00
44	Touch the Clouds Subdivision New Street	Eagle Butte, Dewey Co	Paved construction, 2 mi	$3,500,000.00
45	County Rd 55 Resurfacing	Eagle Butte, Ziebach Co	Stabilized road base with double chip seal and blotter coat	$420,000.00
46	County Rd 224 1/2	Dupree, Ziebach Co	Correct drainage issues	$10,000.00
47	County Rd 7810	West of Dupree, Ziebach Co	Stabilized road base with double chip seal and blotter coat	$150,000.00
			Subtotal	$55,624,230.00

FIGURE 8-4 – Long Range Projects and Costs - Part 3

Project #	Project Title	Project Location	Project Description	Estimated Cost
48	Community Sidewalks, Bear Creek	Dewey Co, see Figure 5-19	New sidewalks, 0.9 mi	$180,000.00
49	Community Sidewalks, Blackfoot	Dewey Co, see Figure 5-20	New sidewalks, 0.8 mi	$160,000.00
50	Community Sidewalks, Bridger	Ziebach Co, see Figure 5-21	New sidewalks, 1.0 mi	$200,000.00
51	Community Sidewalks, Cherry Creek	Ziebach co, see Figure 5-22	New sidewalks, 0.3 mi	$60,000.00
52	Shared Use Path, Cherry Creek	Ziebach co, see Figure 5-22	Shared use path w/lighting, 0.4 mi	$260,000.00
53	Community Sidewalks, Dupree	Ziebach Co, see Figure 5-23	New sidewalks, 4.5 mi	$900,000.00
54	Community Sidewalks, Eagle Butte	Dewey Co, Ziebach Co, see Figure 5-24	New sidewalks, 7.0 mi	$1,400,000.00
55	Community Sidewalks, North Eagle Butte	Dewey Co, see Figure 5-25	New sidewalks, 8.0 mi	$1,600,000.00
56	Shared Use Path, Eagle Butte	Dewey Co, Ziebach Co, see Figure 5-26	Shared use path w/lighting, 1.4 mi	$910,000.00
57	Community Sidewalks, Green Grass	Dewey Co, see Figure 5-27	New sidewalks, 0.3 mi	$60,000.00
58	Community Sidewalks, Iron Lightning	Ziebach Co, see Figure 5-28	New sidewalks, 1.0 mi	$200,000.00
59	Community Sidewalks, LaPlant	Dewey Co, see Figure 5-29	New sidewalks, 1.0 mi	$200,000.00
60	Shared Use Path, LaPlant	Dewey Co, see Figure 5-29	Shared use path w/lighting, 1.0 mi	$650,000.00
61	Community Sidewalks, Promise	Dewey Co, see Figure 5-30	New sidewalks, 0.3 mi	$60,000.00
62	Community Sidewalks, Red Scaffold	Ziebach Co, see Figure 5-31	New sidewalks, 0.7 mi	$140,000.00
63	Shared Use Path, Red Scaffold	Ziebach Co, see Figure 5-31	Shared use path w/lighting, 0.5 mi	$325,000.00
64	Community Sidewalks, Swiftbird	Dewey Co, see Figure 5-32	New sidewalks, 0.8 mi	$160,000.00
65	Community Sidewalks, Takini	Ziebach Co, see Figure 5-33	New sidewalks, 1.1 mi	$220,000.00
66	Community Sidewalks, Thunder Butte	Ziebach Co, see Figure 5-34	New sidewalks, 0.4 mi	$80,000.00
67	Community Sidewalks, Timber Lake	Dewey Co, see Figure 5-35	New sidewalks, 7.7 mi	$1,540,000.00
68	Community Sidewalks, Whitehorse	Dewey Co, see Figure 5-36	New sidewalks, 0.6 mi	$120,000.00
			Subtotal	$9,425,000.00

Grand total of all long range projects: $107,390,310.00

Figures 8-5 through 8-11 are tables of the maintenance and long projects divided into categories based on project type.

Figure 8-5 - Pavement Maintenance Projects

CRST Long Range Pavement Preservation Projects				
Project	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
21	Pavement Preservation - Crack Seal	Community streets in Eagle Butte, Cheyenne River IHS Center, Habitat for Humanity housing, Thunder Butte	2.3 miles crack sealing	$55,170.00
22	Pavement Preservation - Crack and Chip Seal	Community streets in Bear Creek, Cherry Creek, Eagle Butte, Dupree, Fox Ridge Housing, Habitat for Humanity housing, Iron lightning, No Heart housing, Timber Lake	15.6 miles crack and chip sealing	$338,550.00
23	Pavement Preservation - Nonstructural Overlay -	Community streets in Bear Creek, Bridger, Cherry Creek, Dupree, Takini	1.9 miles nonstructural overlay	$567,150.00
24	Pavement Preservation - Nonstructural Overlay - East	Community streets in Eagle Butte, Green Grass, Habitat for Humanity housing, LaPlant, No Heart housing, Timber Lake, Whitehorse, one mile of BIA 14	5.2 miles nonstructural overlay	$1,564,320.00
25	Pavement Preservation - Structural Overlay -	Community streets in Bear Creek, Bridger, Cherry Creek	1.8 miles structural overlay	$921,500.00
26	Pavement Preservation - Structural Overlay - East	Community streets in Eagle Butte, Green Grass, Habitat for Humanity housing, LaPlant, No Heart housing, Timber Lake, Whitehorse, one mile of BIA 14	2.7 miles structural overlay	$1,366,380.00
27	Pavement Preservation - Structural Overlay	Community streets in Cherry Creek, Eagle Butte, Swiftbird, Whitehorse, one mile of BIA 14	2.7 miles structural overlay w/digouts	$1,512,130.00
28	Preservation - Partial Reconstruction	Community streets in Cherry Creek, Eagle Butte, Swiftbird, Takini, and Whitehorse	1.1 miles partial reconstruction	$1,711,650.00
29	Preservation - Full Reconstruction	Community streets in Swiftbird; BIA 7 north of the Moreau River bridge	1.8 miles full reconstruction	$3,514,070.00

Figure 8-6 - Long Range Paving Projects

CRST Long Range Paving Projects				
Project #	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
17	BIA 3 Pavement Preservation	US212 to Moreau River, Dewey Co	Full and partial reconstruction	$13,170,000.00
38	County Rd 10 Reconstruction	North of BIA 3/BIA 7 junction, Dewey Co	Asphalt reconstruction, BUILD/TIGER grant application, funding coordination	$13,650,000.00
43	Eagle Butte Tribal Daycare New Road and Parking Lot	Eagle Butte, Dewey Co	New road and parking lot	$275,000.00
44	Touch the Clouds Subdivision New Community Streets	Eagle Butte, Dewey Co	Paved construction, 2 mi	$3,500,000.00

Figure 8-7 - Long Range Bridge Projects

CRST Long Range Bridge Projects				
Project #	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
14	BIA 7 No Mouth Creek Bridge Replacement	BIA 7, south of Blackfoot, Dewey Co	Bridge Replacement	$1,000,000.00
15	BIA 7 Virgin Creek Bridge Replacement	BIA 7, east of Promise, Dewey Co	Bridge Replacement	$1,500,000.00
16	BIA 7 Moreau River Bridge Replacement	BIA 7, north of Promise, Dewey Co	Bridge Replacement	$4,180,000.00

Figure 8-8 – Gravel Maintenance Projects

CRST Gravel Maintenance Projects				
11	BIA 11 Takini West Resurfacing	Takini School to SD34	Stabilized road base with double chip seal and blotter coat	$2,100,000.00
12	BIA 11 Takini East Resurfacing	BIA 11, Takini School to Cherry Creek, Ziebach Co	Stabilized road base with double chip seal and blotter coat	$5,610,000.00
19	BIA 2 Resurfacing	BIA 2, Dewey County	Stabilized road base with double chip seal and blotter coat	$5,520,000.00
34	BIA 6 Resurfacing	BIA 6, Ziebach County	Stabilized road base with double chip seal and blotter coat	$9,600,000.00
35	BIA 13 Resurfacing	BIA 13, Ziebach County	Stabilized road base with double chip seal and blotter coat	$2,610,000.00
36	BIA 14 Resurfacing	BIA 14, Ziebach County	Stabilized road base with double chip seal and blotter coat	$1,410,000.00
37	County Rd 9015 Resurfacing	Between BIA 2 and Whitehorse, Dewey Co	Stabilized road base with double chip seal and blotter coat	$510,000.00
39	BIA 19 Resurfacing	BIA 19, Dewey Co	Stabilized road base with double chip seal and blotter coat	$1,560,000.00
40	BIA 8 Resurfacing	Between BIA 19 and Rte 8509, Dewey Co	Stabilized road base with double chip seal and blotter coat	$4,950,000.00
41	BIA 803 Resurfacing	BIA 803, Dewey Co	Gravel Resurfacing and Gravel Construction	$795,000.00
45	County Rd 55 Resurfacing	Eagle Butte, Ziebach Co	Stabilized road base with double chip seal and blotter coat	$420,000.00
46	County Rd 224 1/2	Dupree, Ziebach Co	Correct drainage issues	$10,000.00
47	County Rd 7810	West of Dupree, Ziebach Co	Stabilized road base with double chip seal and blotter coat	$150,000.00

Figure 8-9 – Long Range Gravel Projects

CRST Long Range Gravel Projects				
Project #	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
10	Tribal Route 8509 Gravel Construction	S from BIA 8, Dewey Co	Upgrade earth road to gravel	$960,000.00
13	BIA 17 Proposed Road	LaPlant to Promise, Dewey Co	New gravel road construction	$1,176,000.00
31.1	New Tribal Housing Streets	Reservation wide	Gravel construction w/drainage, 1 mile	$200,000.00

Figure 8-10 – Long Range Safety Projects

CRST Long Range Safety Projects				
Project #	**Project Title**	**Project Location**	**Project Description**	**Estimated Cost**
9	BIA 6 Cherry Creek Slide	0.5 mi N of Cherry Creek, Ziebach Co	Scour protection and bank stabilization	$2,000,000.00
20	BIA 2 Moreau River Encroachment	4 mi east of SD63, Dewey Co	Scour protection and bank stabilization	$371,000.00
33	NTTFI Route 7061	Eagle Butte south of 2nd Airport Rd, Ziebach Co	Curve flattening and safety updates	$1,172,500.00

Figure 8-11 – Long Range Pedestrian/Bicycle Projects

Project #	Project Title	Project Location	Project Description	Estimated Cost
48	Community Sidewalks, Bear Creek	Dewey Co, see Figure 5-41	New sidewalks, 0.9 mi	$180,000.00
49	Community Sidewalks, Blackfoot	Dewey Co, see Figure 5-42	New sidewalks, 0.8 mi	$160,000.00
50	Community Sidewalks, Bridger	Ziebach Co, see Figure 5-43	New sidewalks, 1.0 mi	$200,000.00
51	Community Sidewalks, Cherry Creek	Ziebach co, see Figure 5-44	New sidewalks, 0.8 mi	$160,000.00
52	Community Sidewalks, Dupree	Ziebach Co, see Figure 5-45	New sidewalks, 4.5 mi	$900,000.00
53	Community Sidewalks, Eagle Butte	Dewey Co, Ziebach Co, see Figure 5-46	New sidewalks, 7.0 mi	$1,400,000.00
54	Shared Use Path, Eagle Butte	Dewey Co, Ziebach Co, see Figure 5-46	Shared use path w/lighting, 1.4 mi	$910,000.00
55	Community Sidewalks, North Eagle Butte	Dewey Co, see Figure 5-47	New sidewalks, 8.0 mi	$1,600,000.00
56	Shared Use Path, North Eagle Butte	Dewey Co, see Figure 5-47	Shared use path w/lighting, 0.95 mi	$617,500.00
57	Community Sidewalks, Green Grass	Dewey Co, see Figure 5-49	New sidewalks, 0.3 mi	$60,000.00
58	Community Sidewalks, Iron Lightning	Ziebach Co, see Figure 5-50	New sidewalks, 1.0 mi	$200,000.00
59	Community Sidewalks, LaPlant	Dewey Co, see Figure 5-29	New sidewalks, 1.0 mi	$200,000.00
60	Shared Use Path, LaPlant	Dewey Co, see Figure 5-51	Shared use path w/lighting, 1.0 mi	$650,000.00
61	Community Sidewalks, Promise	Dewey Co, see Figure 5-52	New sidewalks, 0.3 mi	$60,000.00
62	Community Sidewalks, Red Scaffold	Ziebach Co, see Figure 5-53	New sidewalks, 0.7 mi	$140,000.00
63	Shared Use Path, Red Scaffold	Ziebach Co, see Figure 5-53	Shared use path w/lighting, 0.5 mi	$325,000.00
64	Community Sidewalks, Swiftbird	Dewey Co, see Figure 5-54	New sidewalks, 0.8 mi	$160,000.00
65	Community Sidewalks, Takini	Ziebach Co, see Figure 5-55	New sidewalks, 1.1 mi	$220,000.00
66	Community Sidewalks, Thunder Butte	Ziebach Co, see Figure 5-56	New sidewalks, 0.4 mi	$80,000.00
67	Community Sidewalks, Timber Lake	Dewey Co, see Figure 5-57	New sidewalks, 7.7 mi	$1,540,000.00
68	Community Sidewalks, Whitehorse	Dewey Co, see Figure 5-58	New sidewalks, 0.6 mi	$120,000.00

RECOMMENDED STUDIES

Some transportation issues were identified that were beyond the scope of this transportation plan. Additional analysis is needed to explore potential improvements. A list of recommended transportation studies follows:

- Sidewalk Conditions and Needs Survey – There were several areas observed in CRST communities where sidewalks are old and deteriorating or missing altogether. Sidewalk replacement and repair can be costly. CRST has limited resources and cannot reasonably repair or replace sidewalks in the same year that the needs are identified. A comprehensive survey would provide current conditions of existing sidewalks, which the Tribe can then utilize to establish a schedule for maintenance, repairs and replacement, and new construction. There is a project in the long range element of the LRTP for this scope of work (Project #21).

- Signing Inventory and Consistency Study – Existing traffic control signs within the Reservation should be inventoried. This will allow further analysis to determine whether they have been appropriately and consistently applied. This measure would provide verification that appropriate traffic control signing (stop and yield signs) are in place and within MUTCD specifications, increasing safety for the traveling public. The SDDOT conducted a paved roads sign inventory in each county beginning late 2018.

- Non-paved roadway conditions survey – a set of standards and procedures needs to be established for categorizing non-paved roadway conditions, as well as for establishing future priorities for varying levels of effort to be applied to improve these roads.

- Complete a study of street lighting conditions and needs within CRST towns and subdivisions.

- Complete Reservation wide road safety audits (RSAs).

- Complete a culvert inventory. Analyzed data can then be used to update the Tribe's FEMA database, and input into GIS to provide spatial relationships.

- Reservation wide crash data analysis to be used for data collection, sharing, and analysis. This would include entering BIA crash records into TraCS system.

- Conduct Reservation wide seat belt utilization study.

- Conduct a geological study to identify and develop a new aggregate source in the southwest part of the Reservation.

- Conduct a utilities study to identify underground mains and record locations with GIS mapping.