



DRAFT

OGDLALA SIOUX

LONG RANGE TRANSPORTATION PLAN

JUNE 2018





TABLE OF CONTENTS

CHAPTER 1 - EXECUTIVE SUMMARY	1
EXISTING CONDITIONS AND RECOMMENDATIONS.....	1
MULTIMODAL RECOMMENDATIONS	2
POLICY RECOMMENDATIONS.....	3
PROJECT FUNDING.....	4
PROJECT PRIORITIZATION PLAN.....	4
RECOMMENDED STUDIES AND PROGRAMS.....	9
CHAPTER 2 - INTRODUCTION	10
PLAN PURPOSE	10
RECENT AND CONCURRENT STUDIES AND PLANS.....	11
STUDY AREA.....	12
CHAPTER 3 - EXISTING CONDITIONS.....	25
ROAD INVENTORY	25
TRANSPORTATION FACILITY CONDITIONS.....	29
TRAFFIC CONDITIONS AND TRIP GENERATION	63
EXISTING MAINTENANCE STRATEGY AND FUNDING.....	80
CHAPTER 4 - PUBLIC INVOLVEMENT.....	83
PUBLIC INPUT RECEIVED – ISSUES AND NEEDS	84
CHAPTER 5 - PAVED ROAD AND BRIDGE RECOMMENDATIONS	89
CONTINUE PAVEMENT MANAGEMENT PROGRAM	89
ESTABLISH A SCHEDULE FOR PAVEMENT PRESERVATION AND MAINTENANCE.....	96
ADDRESS OVER-WEIGHT TRUCKS ON RESERVATION ROADS	96
UNDERTAKE SHORT AND LONG RANGE PAVING PROJECTS	97
COMPLETE BRIDGE IMPROVEMENT PROJECTS.....	98
CHAPTER 6 - NON-PAVED ROADWAY RECOMMENDATIONS	100
SURFACE AND BASE MATERIALS	100
MAINTENANCE	100
GRAVEL REHABILITATION	101
SURFACE TREATMENTS	101
GRAVEL PROJECT PRIORITIES.....	101
CHAPTER 7 - MULTIMODAL RECOMMENDATIONS.....	103
PEDESTRIAN AND BICYCLE FACILITY IMPROVEMENTS.....	103
TRANSIT IMPROVEMENTS	105
CHAPTER 8 - POLICY RECOMMENDATIONS	106





HOUSING, SOCIAL AND ECONOMIC DEVELOPMENT PRIORITIES 106

SYSTEM MANAGEMENT PRIORITIES 106

ROADWAY CROSS-SECTION STANDARDS 108

AIRPORT PROPERTY DESIGNATION 110

DEVELOPMENT REVIEW 110

ENVIRONMENTAL CONSIDERATIONS 110

CULTURAL CONSIDERATIONS 111

ENERGY CONSERVATION CONSIDERATIONS 111

CHAPTER 9 - PROJECT FUNDING ALTERNATIVES 112

TRIBAL TRANSPORTATION PROGRAM FUNDS 112

TRIBAL TRANSPORTATION PROGRAM SAFETY FUNDS 113

TRIBAL BRIDGE PROGRAM FUNDS 113

TRANSPORTATION ALTERNATIVE & RECREATIONAL TRAILS FUNDING 114

BUILD GRANTS 115

FEDERAL TRANSPORTATION AUTHORITY (FTA) TRIBAL TRANSIT GRANTS..... 116

SOUTH DAKOTA TRANSPORTATION ECONOMIC DEVELOPMENT PROGRAMS..... 116

LOCAL FEES AND TAXES..... 116

RECOMMENDED FUNDING STRATEGY 117

CHAPTER 10 - PROJECT PRIORITIZATION PLAN 120

SHORT AND LONG RANGE PROJECT RECOMMENDATIONS 120

RECOMMENDED STUDIES..... 125

FISCAL YEAR 2017 RIFDS INVENTORY 125

FIGURES

FIGURE EX-1 - SHORT RANGE PROJECT LOCATIONS (FY 2018 - 2022 TTIP) 5

FIGURE EX-2 - RECOMMENDED SHORT RANGE SEAL COAT PROJECTS..... 6

FIGURE EX-3 - RECOMMENDED SHORT PROJECTS (2019-2023)..... 7

FIGURE EX-4 - LONG RANGE PROJECTS AND COSTS..... 8

FIGURE 2-1 - STUDY AREA 14

FIGURE 2-2 - STUDY AREA - ALLEN 15

FIGURE 2-3 - STUDY AREA - BATESLAND 16

FIGURE 2-4 - STUDY AREA - KYLE 17

FIGURE 2-5 - STUDY AREA - MANDERSON..... 18

FIGURE 2-6 - STUDY AREA - MARTIN..... 19

FIGURE 2-7 - STUDY AREA - OGLALA 20

FIGURE 2-8 - STUDY AREA - PINE RIDGE 21

FIGURE 2-9 - STUDY AREA - PORCUPINE 22

FIGURE 2-10 - STUDY AREA - WANBLEE 23

FIGURE 2-11 - STUDY AREA - WOUNDED KNEE 24

FIGURE 3-1 - ROADWAY FUNCTIONAL CLASSIFICATIONS..... 27





FIGURE 3-2 - ROADWAY OWNERSHIP AND FUNCTIONAL CLASSIFICATION 28

FIGURE 3-3 - ROADWAY OWNERSHIP AND SURFACE TYPES 28

FIGURE 3-4 - PAVED ROADWAY CONDITIONS 29

FIGURE 3-5 - PAVED ROADWAY CONDITIONS 30

FIGURE 3-6 - PAVED ROADWAY REPAIR TYPE BY YEAR..... 31

FIGURE 3-7 - PAVED ROADWAY REPAIR TYPE BY YEAR..... 32

FIGURE 3-8 - PASER RESULTS DISTRIBUTION 37

FIGURE 3-9 - PAVEMENT SURFACE CONDITIONS ON PAVED BIA ROADS 38

FIGURE 3-10 - NON-PAVED ROADWAY TYPES AND CONDITIONS 39

FIGURE 3-11 - EXISTING BRIDGE AND CULVERT STRUCTURE LOCATIONS 42

FIGURE 3-12 -2017 NATIONAL BRIDGE INVENTORY - BRIDGE CONDITIONS 43

FIGURE 3-13 - EXISTING AND PROPOSED SIDEWALKS - ALLEN 45

FIGURE 3-14 - EXISTING AND PROPOSED SIDEWALKS - BATESLAND 46

FIGURE 3-15 - EXISTING AND PROPOSED SIDEWALKS - KYLE 47

FIGURE 3-16 - EXISTING AND PROPOSED SIDEWALKS - MANDERSON 48

FIGURE 3-17 - EXISTING AND PROPOSED SIDEWALKS AND SHARED-USE PATHS - MARTIN 49

FIGURE 3-18 - EXISTING AND PROPOSED SIDEWALKS AND SHARED-USE PATHS - OGLALA..... 50

FIGURE 3-19 - EXISTING AND PROPOSED SIDEWALKS AND SHARED-USE PATHS - PINE RIDGE..... 51

FIGURE 3-20 - EXISTING AND PROPOSED SIDEWALKS - PORCUPINE..... 52

FIGURE 3-21 - EXISTING AND PROPOSED SIDEWALKS AND SHARED-USE PATHS - WANBLEE..... 53

FIGURE 3-22 -OST TRANSIT SERVICE SCHEDULE 57

FIGURE 3-23 -OST TRANSIT SERVICE ROUTES 58

FIGURE 3-24 - PINE RIDGE TRANSIT SERVICE SCHEDULE 59

FIGURE 3-25 - PINE RIDGE TRANSIT SERVICE ROUTES 60

FIGURE 3-26 - THUNDER VALLEY MASTERPLAN..... 61

FIGURE 3-27 - THUNDER VALLEY AERIAL SITE PLAN..... 62

FIGURE 3-28 - HIGHEST OST TRAFFIC LOCATIONS 63

FIGURE 3-29 - EXISTING AVERAGE DAILY TRAFFIC 65

FIGURE 3-30 - EXISTING AVERAGE DAILY TRAFFIC 66

FIGURE 3-31 - YEAR 2043 PROJECTED AVERAGE DAILY TRAFFIC..... 67

FIGURE 3-32 - YEAR 2043 PROJECTED AVERAGE DAILY TRAFFIC..... 68

FIGURE 3-33 - PINE RIDGE ROUNDABOUTS PLANNED BY SDDOT 69

FIGURE 3-34 - SHARPS CORNER STORE CONCEPTUAL CIRCULATION PLAN 70

FIGURE 3-35 - PINE RIDGE INDIAN RESERVATION SAFETY CONCERN CORRIDORS..... 72

FIGURE 3-36 - PINE RIDGE INDIAN RESERVATION CRASHES..... 73

FIGURE 3-37 - PINE RIDGE INDIAN RESERVATION CRASHES..... 74

FIGURE 3-38 - OST CRASH FATALITIES BY CAUSE 75

FIGURE 3-39 - ROUNDABOUT REDUCTION IN COLLISIONS..... 78

FIGURE 3-40 - BIA ROUTE 26 REALIGNMENT..... 79

FIGURE 5-1 - AVERAGE COSTS OF IMPROVEMENTS 94

FIGURE 5-2 - LIFE-EXTENDING BENEFIT OF PREVENTIVE MAINTENANCE TREATMENT..... 95

FIGURE 5-3 - SHORT RANGE PRIORITY PAVING PROJECTS 97

FIGURE 5-4 - LONG RANGE PRIORITY PAVING PROJECTS 98

FIGURE 5-5 -ESTIMATED BRIDGE MAINTENANCE COSTS 99

FIGURE 6-1 - GRAVEL SURFACING MAINTENANCE PROJECT PRIORITIES 102

FIGURE 7-1 - SUGGESTED SIDEWALK, SHARED USE PATH, AND PATH LIGHTING PRIORITIES..... 104

FIGURE 8-1 - STANDARD HIGH-SPEED PAVED BIA ROAD TYPICAL SECTION 108





FIGURE 8-2 - STANDARD HIGH-SPEED GRAVEL ROAD TYPICAL SECTION.....	108
FIGURE 8-3 - STANDARD LOW SPEED GRAVEL ROAD TYPICAL SECTION	109
FIGURE 8-5 - STANDARD TRIBAL HOUSING & RESIDENTIAL STREET TYPICAL SECTION - URBAN	109
FIGURE 8-6 - STANDARD SEPARATED SHARED USE PATH TYPICAL SECTION.....	110
FIGURE 8-7 - STANDARD SIDEWALK TYPICAL SECTION	110
FIGURE 9-1 - ANNUAL TRIBAL BRIDGE PROGRAM FUNDING.....	114
FIGURE 9-2 - FUNDING MECHANISMS BY PROJECT TYPE	117
FIGURE 9-3 - ANNUAL TRIBAL PROGRAM FUNDING.....	119
FIGURE 9-4 - POSSIBLE ANNUAL FUNDING USE STRATEGY	119
FIGURE 10-1 - CURRENT SHORT RANGE PROJECTS	121
FIGURE 10-2 - RECOMMENDED SHORT RANGE SEAL COAT PROJECTS.....	122
FIGURE 10-3 - RECOMMENDED SHORT PROJECTS (2019-2023).....	123
FIGURE 10-4 - LONG RANGE PROJECTS AND COSTS.....	124

APPENDICES

- APPENDIX A - RESOLUTION OF APPROVAL AND PUBLIC INVOLVEMENT
- APPENDIX B - SIGN RETROREFLECTIVITY POLICY
- APPENDIX C - FISCAL YEAR 2016 RIFDS INVENTORY SUMMARY





DEFINITION OF ACRONYMS

AADT - Average Annual Daily Traffic
ADA - Americans with Disabilities Act
BIA - Bureau of Indian Affairs
CFR - Code of Federal Regulations
FAA - Federal Aviation Administration
FAST Act - Fixing America's Surface Transportation Act
FHWA - Federal Highway Administration
GIS - Geographic Information System
IRR - Indian Reservation Roads
LED - Light-Emitting Diode
LRTP - Long Range Transportation Plan
MAP-21 - Moving Ahead for Progress in the 21st Century Act
MUTCD - Manual on Uniform Traffic Control Devices
OSLH - Oglala Sioux Lakota Housing
OST - Oglala Sioux Tribe
OSTDOT - Oglala Sioux Tribe Department of Transportation
OSTDPS - Oglala Sioux Tribe Department of Public Safety
PASER - Pavement Surface Evaluation and Rating
PM - Particulate Matter
PMP - Pavement Management Program
RIFDS - Road Inventory Field Data System
RMD - Road Maintenance Department
SD - South Dakota
SDDOT - South Dakota Department of Transportation
SD LTAP - South Dakota Local Transportation Assistance Program
SDDPS - South Dakota Department of Public Safety
STIP - State Transportation Improvement Program
TA - Transportation Alternatives
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 - EXECUTIVE SUMMARY

Oglala Sioux Tribe (OST) officials needed a strategic approach to respond to existing and anticipated future transportation issues. As a result, 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 and develop strategies and recommend projects to accommodate them
- To review the current transportation system maintenance strategy and consider opportunities to improve it.
- To provide a basis for future transportation improvement programming that is sustainable and is tied to project costs and potential funding

The short-range element applies through the year 2022. The long-range element for this plan applies through the year 2043. The Federal Register suggests this plan be updated every 5 years.

EXISTING CONDITIONS AND RECOMMENDATIONS

A detailed investigation was made to identify existing transportation facilities conditions and needs. The investigation determined that there are significant transportation needs throughout the Reservation. These needs, along with recommendations are summarized as follows:

PAVED ROADWAYS

Through improved maintenance efforts, as well as successful applications for additional funding, the OST has made substantial progress in improving the condition of their paved road system in recent years. Still, there is much work to be done.

According to analysis completed in this plan, there remains about 80 miles of paved roads that are candidates for either reconstruction or a structural overlay throughout the short and long-range timelines addressed by this plan. It is recommended that the OST continue to maintain their paved roads as the Tribe's highest transportation priority. The goal of this effort should be to maintain as many of the Tribe's paved roads as possible through crack sealing and seal coats at regular intervals, so they do not deteriorate to the level that expensive reconstruction is needed.

Slowly and over time, roads that already require expensive reconstruction should be rebuilt as funding allows. The goal here is that eventually, no roads require expensive reconstruction and more of the Tribes' money will be available to address other needs. This goal should be viewed with a high level of patience, as it will take many years to fulfill this goal unless significant additional funds become available.





NONPAVED ROADWAYS

The issue with OST's system of nonpaved roadways is that there are so many miles in poor to very poor condition, that OST road maintenance is constantly responding to emergencies. Therefore, strategic responses to this problem suggests that the following items can have the greatest impact on making improvements over time:

- Using better materials (gravel)
- Using better equipment
- Maintaining a more experienced work force
- Reducing maintenance inefficiencies
- Taking advantage of additional funding opportunities, whenever they arise
- Reducing wear and tear caused by trucks and freight related industries

Using better materials (gravel)

A primary issue with the OST's nonpaved roadways has been a lack of good gravel or any gravel at all from OST gravel pits. This issue is being addressed in 2018 through the Gravel Pit Exploration Study. Once good gravel is more readily available, the quality and longevity of gravel maintenance on the Reservation should improve dramatically. Gravel availability at various locations throughout the Reservation will also reduce hauling distances, making the OST Road Maintenance Department (RMD) more efficient and more capable of completing gravel maintenance projects at a reduced cost.

MULTIMODAL RECOMMENDATIONS

The OST has successfully applied for numerous grants to improve their sidewalk and pathway system over the years. The result of these efforts is a well-established system of sidewalks and shared use paths.

For this study, new maps of towns on the Reservation have been made that show existing sidewalks and shared use paths, as well as locations that develop a high level of pedestrian and bicycle activity. Examples of high pedestrian and bicycle activity generators include schools, stores, residential developments, and other land uses. These maps also show gaps in the sidewalk and pathway system that should be addressed over time. It is anticipated that these maps will be a valuable resource in future grant applications.





POLICY RECOMMENDATIONS

It is recommended that current Tribal practices for location of new housing and for housing rehabilitation be reviewed. Optimal locations for future housing should be identified and promoted in locations adjacent to well-maintained transportation corridors.

It is further recommended that Tribal priorities be guided using the following hierarchy of roadway needs:

Priority #1 - Conduct normal maintenance and needed upgrades and/or repairs on existing bridges, culverts, and guardrails, and crack sealing and seal coats on paved BIA and Tribal facilities

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

Priority #3 - Complete overlays or reconstruction on paved BIA highways

Priority #4 - Correct gravel road surface and cross section/drainage deficiencies on primary routes

Priority #5 - Complete overlays and reconstruction on paved city and subdivision streets

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, and crack sealing and seal coats on paved BIA and Tribal facilities be given top priority over the rest of the transportation system. This will enable the Tribe to keep as much of their existing system in good condition as possible, without it getting in poor condition resulting in expensive reconstruction.

It is also recommended that roadways that are in fair to good condition be set up on a rotational program of crack sealing, seal coats and/or overlays. Sealing and filling cracks in asphalt pavements, to include long-term crack sealing should be undertaken the year prior to seal coat or non-structural overlay projects. 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. Roadway, path and sidewalk cross-section standards have been proposed within this document. It is recommended that these standards be used on all future projects.

Given the length of time that has passed since most of the paved roads on the Reservation has received a seal coat, it is recommended that they receive a seal coat as soon as possible, ideally in 2019. Then, in another 5 years roughly half the Reservation paved roads should receive another seal coat, with the other half receiving a seal coat in 5 years after that. This will allow half the Reservation to receive a seal coat every 5 years.





While not receiving as high a priority as paved routes, maintenance of the gravel road system is important to the mobility, economic viability, safety, and quality of life of many of the OST's residents. A study is recommended to identify secondary and primitive roads that should receive maintenance and to improve proactiveness, resulting in fewer emergency events.

Given that the OSTDOT 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. 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. Per the airport conditions discussion covered in this report, the OST Tribal Council needs to act to legally designate the Tribal land for the existing and future airport boundary as "airport property".

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

PROJECT FUNDING

This plan provides information on the various funding programs that are available. It is recommended that the OST submit applications to these alternative sources of funding that apply to supplement typical funding resources.

PROJECT PRIORITIZATION PLAN

Short range projects are those anticipated to be initiated or completed by the end of the year 2022. These have been incorporated into the Tribal Transportation Improvement Program (TTIP). To maintain the Tribe's economic sustainability, funding must be carefully distributed to the most critical locations.

Long range projects are those anticipated to be completed after the year 2022. 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 OST can pull from alternative funding sources described in this report, or if Tribal priorities change. Current short range project locations listed in the TTIP are shown in Figure EX-1.





FIGURE EX-1 - Short Range Project Locations (FY 2018 - 2022 TTIP)

OTLALA SIOUX TRIBE					
SUMMARY OF PROJECTS ON TTIP - FY 2018-2022					
Project Name	FY 2018	FY 2019	FY 2020	FY2021	FY 2022
Transportation Planning	\$ 268,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000
TTIP Program Management and Oversight	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
Road Maintenance	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
Heavy Equipment Acquisition and Repairs	\$ 500,000	\$ 500,000	\$ 150,000	\$ 150,000	\$ 150,000
Bus Transit Services	\$ 100,000	\$ 100,000	\$ 75,000	\$ 75,000	\$ 75,000
O&T Bridge Inspections	\$ 55,000		\$ 55,000		\$ 55,000
Multi-Route Pavement Striping	\$ 400,000	\$ 575,000	\$ 400,000	\$ 575,000	\$ 400,000
Allen Road - BIA 4 Extension	\$ 4,120,000				
BIA 27 - MP 43.8 - Emergency Pipe Culvert Repair (ERFD)	\$ 5,000				
BIA 27 - MP 44.5 - Emergency Pipe Culvert Repair (ERFD)	\$ 90,000				
BIA 27 - MP 47.7 - Emergency Pipe Culvert Repair (ERFD)	\$ 45,000				
BIA 2 - MP 3.2 Emergency Pipe Culvert Repair (ERFD)	\$ 10,000				
BIA 41 - North Reservation Line to 2.4 Miles South of BIA 2 - Reconstruction	\$ 2,900,000	\$ 2,800,000			
BIA 2 - Sharps Corner to Kyle - Overlay	\$ 2,707,000				
BIA 41 - BIA 32 North to US 18 - Overlay	\$ 2,400,000				
BIA 49 - Wounded Knee Bridge A133		\$ 230,000			
Multi-Route Chip Seal	\$ 1,200,000			\$ 800,000	
BIA 50 - Oglala Housing Streets	\$ 30,000	\$ 1,100,000			
Various Routes - Culvert Inventory, Inspections, & Rehabilitation		\$ 100,000			
BIA 6 - Wooden Bridge A122	\$ 45,000		\$ 800,000		
BIA 2 - Cury Table Overlay			\$ 5,000,000	\$ 2,000,000	\$ 2,000,000
BIA 90 - Moccasin Park Bridge A155	\$ 60,000		\$ 300,000		
BIA 88 - White River Bridge A154	\$ 135,000			\$ 1,200,000	\$ 542,660
BIA 32 - Pipe Repairs	\$ 100,000				
BIA 41 - US 18 to White River - Overlay				\$ 2,000,000	\$ 2,000,000
Kyle Pathway (Partial TA Funding)	\$ 31,000	\$ 563,890			
Kyle Pathway Lighting	\$ 28,000	\$ 347,000			
Allen Pathway Lighting	\$ 23,000	\$ 272,000			
Manderson Pathway	\$ 60,000		\$ 800,000		
SD407 Pathway	\$ 90,000			\$ 1,000,000	
School Zone Assessment and Implementation (Various Routes)	\$ 281,000				
Gravel Pit Exploration	\$ 120,000				
Gravel Pit Development		\$ 50,000	\$ 50,000		
Bridge Maintenance		\$ 50,000		\$ 50,000	
BIA 2 Kyle to SD44		\$ 30,000	\$ 100,000	\$ 200,000	\$ 200,000
BIA 32 - Pine Ridge to BIA 41 - Spot Reconstruction and Add Gravel Shoulders		\$ 100,000	\$ 1,000,000		
BIA 33 - MP5.5 Culvert Repair	\$ 20,000	\$ 250,000			
BIA 33/28 - Overlay BIA 14 to North			\$ 1,000,000	\$ 1,000,000	\$ 1,136,158
BIA 27 - Spot Road Repair South of Rockyford	\$ 120,000				
BIA 33 - Manderson to US 18 (Holy Rosary)		\$ 50,000	\$ 100,000	\$ 100,000	\$ 100,000
Manderson Housing Streets					
					FY2020+
TOTAL PROPOSED EXPENDITURES	\$ 16,293,000	\$ 7,642,890	\$ 10,855,000	\$ 9,675,000	\$ 7,183,818

Note: Amounts in red denote anticipated grant funding





It is recommended that the TTIP be amended to increase expenditures for seal coat priority projects. Currently, the FY 2018-2022 TTIP includes \$2.0 million dollars for seal coat projects. This should be increased to \$4.575 million dollars to preserve roads that haven't received a seal coat since 2010-2012. These roads are shown in Figure EX-2.

FIGURE EX-2 - Recommended Short Range Seal Coat Projects

Priority	BIA Route	Location	Length (Miles)	PASER Rating	Year of Repair	ADT	Estimated Cost	Notes
1	28	Wounded Knee - Manderson	8.8	6	<2008	817	\$ 308,000.00	
2	4	BIA 63 - BIA 2	16.6	3-6	2010	738	\$ 581,000.00	
3	23	BIA 27 East	3.9	5	2010	582	\$ 136,500.00	
4	27	Porcupine Butte - Rockyford	21	5-6	2012	1744	\$ 735,000.00	2018 Spot Repair
5	39	BIA 4 - BIA 2	5	6	2010	254	\$ 175,000.00	East of Kyle
6	33	Manderson to BIA 14	6.5	7	2010	145	\$ 227,500.00	
7	122	E. of State 391	3.6	-	2010	67	\$ 126,000.00	
8	27	US 18 - Porcupine Butte	14.5	7-10	2010	1704	\$ 507,500.00	
9	41	US 18 - White River	10.4	6-7	2012	606	\$ 364,000.00	2021-2022 Overlay
10	41	White River - 2.4 Miles S. of BIA 2	10.3	7-8	2010	681	\$ 360,500.00	
11	-	Housing and Miscellaneous	30.1	-	<2008	-	\$ 1,053,500.00	
		Totals	130.7				\$ 4,574,500.00	

Housing and Miscellaneous

BIA Route	Location	Length (Miles)	PASER Rating	Year of Repair	ADT	Estimated Cost	Notes
	Kyle Housing Streets	3.9		<2008	NA	\$ 136,500.00	Need to be repaved
	Manderson Housing Streets	1.4		<2008	NA	\$ 49,000.00	
36	Pine Ridge Housing Streets	13.8	-	2010	varies	\$ 483,000.00	
	Wanblee School Housing Streets	0.4	-	<2008	NA	\$ 14,000.00	Condition to be field verified
	Wounded Knee Housing Streets	1.1	-	<2008	NA	\$ 38,500.00	Condition to be field verified
40	Loneman Housing	0.2	-	<2008	378	\$ 7,000.00	Condition to be field verified
43	Allen Housing	1.2	-	<2008	NA	\$ 42,000.00	Condition to be field verified
47	Porcupine School	1	-	<2008	645	\$ 35,000.00	Condition to be field verified
53	Sunrise Housing	1.3	-	<2008	926	\$ 45,500.00	Condition to be field verified
55	Sharps Corner Housing	0.3	-	<2008	477	\$ 10,500.00	Condition to be field verified
56	Governor Housing	0.5	-	<2008	355	\$ 17,500.00	Condition to be field verified
60	Evergreen Housing	1.6	-	<2008	1346	\$ 56,000.00	Condition to be field verified
62	Wakpamni Housing	0.4	-	<2008	237	\$ 14,000.00	Condition to be field verified
142	Oglala Loneman Pathway	2.8	-	<2008	NA	\$ 98,000.00	Condition to be field verified
272	Porcupine Store Link	0.2	-	<2008	NA	\$ 7,000.00	Condition to be field verified
	Totals	30.1				\$ 1,053,500.00	

Recommended short range projects to be considered in the next TTIP, which include advancement of needed seal coats Reservation-wide, are shown in Figure EX-3. There are also many short-range projects anticipated to be completed under the Tribe's maintenance program. These include various culvert replacements, gravel road improvement projects, and general maintenance activities.

Long range projects and costs are shown in Figure EX-4. They are currently considered long range because current and projected funding doesn't indicate the ability to complete them





prior to 2023. If funding becomes available or if priorities change, it is possible some of these projects may move into the short-range element of the LRTP.

FIGURE EX-3 - Recommended Short Projects (2019-2023)

Project Name	FY 2019	FY 2020	FY 2021	FY2022	FY 2023
Transportation Planning	\$ 268,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000
TTP Program Management and Oversight	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
Road Maintenance	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
Heavy Equipment Acquisition and Repairs	\$ 500,000	\$ 500,000	\$ 150,000	\$ 150,000	\$ 150,000
Bus Transit Services	\$ 100,000	\$ 100,000	\$ 75,000	\$ 75,000	\$ 75,000
DST Bridge Inspections		\$ 55,000		\$ 55,000	
Multi-Route Pavement Striping	\$ 575,000	\$ 400,000	\$ 575,000	\$ 400,000	\$ 575,000
Allen Road - BIA 4 Extension					
BIA 27 - MP 43.8 - Emergency Pipe Culvert Repair (ERFD)					
BIA 27 - MP 44.5 - Emergency Pipe Culvert Repair (ERFD)					
BIA 27 - MP 47.7 - Emergency Pipe Culvert Repair (ERFD)					
BIA 2 - MP 3.2 Emergency Pipe Culvert Repair (ERFD)					
BIA 41 - North River to Pine Lake to 2.5 Miles South of BIA 2 - Reconstruction					
BIA 2 - Sharps Corner to Kyle - Overlay					
BIA 41 - BIA 32 North to US 18 - Overlay					
BIA 49 - Wounded Knee Bridge A133	\$ 230,000				
Multi-Route Chip Seal	\$ 4,575,000				
BIA 50 - Oglala Housing Streets	\$ 1,100,000				
Various Routes - Culvert Inventory, Inspections, & Rehabilitation	\$ 100,000				
BIA 6 - Wooden Bridge A122		\$ 800,000			
BIA 2 - Cuny Table Overlay		\$ 5,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000
BIA 30 - Moccasin Park Bridge A155		\$ 800,000			
BIA 88 - White River Bridge A154			\$ 1,200,000	\$ 542,660	\$ 542,660
BIA 32 - Pipe Repairs					
BIA 41 - US 18 to White River - Overlay			\$ 2,000,000	\$ 2,000,000	\$ 2,000,000
Kyle Pathway (Partial TA Funding)	\$ 563,890				
Kyle Pathway Lighting	\$ 347,000				
Allen Pathway Lighting	\$ 272,000				
Manderson Pathway		\$ 800,000			
SD407 Pathway			\$ 1,000,000		
Gravel Pit Development	\$ 50,000	\$ 50,000			
Bridge Maintenance	\$ 50,000		\$ 50,000		
BIA 2 Kyle to SD44	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
BIA 32 - Pine Ridge to BIA 41 - Spot Reconstruction and Add Gravel Shoulders	\$ 100,000	\$ 1,000,000			
BIA 33 - MP5.5 Culvert Repair	\$ 250,000				
BIA 33/28 - Overlay BIA 14 to North		\$ 1,000,000	\$ 1,000,000	\$ 1,136,158	\$ 1,136,158
BIA 27 - Spot Road Repair South of Rockyford	\$ 120,000				
BIA 33 - Manderson to US 18 (Holy Rosary)	\$ 50,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
Manderson Housing Streets					
TOTAL PROPOSED EXPENDITURES	\$ 9,800,890	\$ 11,330,000	\$ 8,875,000	\$ 7,183,818	\$ 7,303,818
FUNDING					
FUNDS CARRIED OVER FROM PREVIOUS YEAR	\$ 3,556,495	\$ 2,475,495	\$ 318,195	\$ 1,670,895	\$ 1,853,777
ESTIMATED TTP FUNDS (BASED ON PREVIOUS 2017 FUNDING)	\$ 7,115,890	\$ 7,372,700	\$ 7,372,700	\$ 7,372,700	\$ 7,372,700
OGLALA HOUSING ?	\$ 300,000				
TTP BRIDGE FUNDING - INSPECTIONS	\$ 55,000		\$ 55,000		
TTP BRIDGE FUNDING PROPOSALS	\$ 230,000	\$ 1,600,000	\$ 1,200,000		
BIA 638 CONTRACT GRANT FOR MINING AND MINERAL					
ERFD FUND REIMBURSEMENT					
SDDOT TA FUNDING GRANT PROPOSAL (\$400,000)	\$ 400,000				
TTP SAFETY FUNDS PROPOSAL (\$2,101,000 Requested 12/2017)	\$ 613,000	\$ 800,000	\$ 1,000,000		
TOTAL AVAILABLE FUNDS	\$ 12,276,385	\$ 12,248,195	\$ 10,545,895	\$ 9,043,595	\$ 9,232,477
FUNDS CARRIED FORWARD	\$ 2,475,495	\$ 318,195	\$ 1,670,895	\$ 1,853,777	\$ 1,928,653
6/15/2018					





FIGURE EX-4 - Long Range Projects and Costs

BIA Route	Location	Length (Miles)	Average PASER Rating	ADT	Recommended Treatment Type	Estimated Cost	Notes
2	BIA 41 - BIA 27 (Cuny Table)	21.4	8-10	115	Chip Seal	\$ 910,000.00	Recently improved
2	BIA 27 - BIA 4	14.6	10	2186	Chip Seal	\$ 620,500.00	Recently improved
2	BIA 4 - SD 44	19.4	5-6	635	Reconstruction	\$ 36,000,000.00	Reconst. & shoulder widening
4	BIA 22 - BIA 63	2.9	10	1016	Chip Seal	\$ 123,250.00	Overlaid in 2017-2018
25	BIA 2 north	2.3	1	643	New Asphalt Paving	\$ 1,150,000.00	Northwest of Kyle
26	BIA 2 to BIA 25	1.9	1	844	Gravel Rehabilitation	\$ 1,425,000.00	Kyle Cut Across
27	US 18 - North Res. Line	48.5	7-10	1554	Chip Seal	\$ 2,061,250.00	Improvements pending
28	Wounded Knee - Manderson	8.8	6	817	Overlay	\$ 2,420,000.00	Funding currently unavailable
32	Slim Butte - Pine Ridge	13	7-8	827	Overlay	\$ 5,000,000.00	Shoulder, sideslopes, culverts
33	Manderson to US Highway 18	13.8	1	65	New Asphalt Paving	\$ 23,460,000.00	Requested by Tribal Council
35	US 18 - W. to Oglala	5.9	3-5	1510	Structural Overlay	\$ 2,832,000.00	Concurrent with BIA 115
41	Slim Butte (BIA 32) - US 18	6.7	10	151	Chip Seal	\$ 284,750.00	Recently improved
41	US 18 - White River	10.4	6-7	606	Structural Overlay	\$ 6,000,000.00	to north of BIA 16
41	2.4 Miles S. of BIA 2 - 2.4 miles north	4.8	5-7	549	Reconstruction	\$ 5,100,000.00	Also shows up in SR Other
Ext BIA 27	North Res. Line - Scenic	6.8	-	798	Reconstruction	\$ 10,880,000.00	Potential grant application
	Medicine Root Road	0.2	-	643	Blade and Gravel	\$ 10,000.00	Needs repair - in Kyle
BIA 1	Craven Road Solid Waste Site	-	-	-	Blade and Gravel	\$ 10,000.00	Site is muddy and needs gravel
17	American Horse Creek Road	18.3	-	-	Blade and Gravel	\$ 100,000.00	Build up higher and regravol
	Potato Creek Access Reroute	0.2	-	-	New Construction	\$ 30,000.00	Too steep and winding
25	North Route north of Kyle	4.4	-	-	Blade and Gravel	\$ 22,000.00	Gravel and/or Paving
17	5-mile to Batesland	-	-	-			
16	North of Oglala	3	-	-	Blade, Gravel, Drainage	\$ 15,000.00	Continued upgrades
29	Wolf Creek Housing Road	2	-	-	Blade and Gravel	\$ 10,000.00	Address wash boards
	Mouse Creek Road	13.5	-	-	Blade and Gravel	\$ 68,000.00	Gravel or pavement upgrade
	All Thunder Valley Roads	0.8	-	-	New Construction	\$ 1,300,000.00	Asphalt paving
24	Grass Creek Rd - Oglala to Manderson	21	-	-	Blade and Gravel	\$ 210,000.00	Gravel and Route upgrades
	Miscellaneous Locations	-	-	-	New Construction	\$ 150,000.00	Construction of 8 Transit Shelters
2	Near Thunder Valley	-	-	-	New Construction	\$ 150,000.00	Shoulder and turn lane additions
Misc.	Wind Farm Route Improvements	-	-	-	New Construction	\$ 30,000,000.00	Road, structural and drainage
Total						\$130,341,750.00	





RECOMMENDED STUDIES AND PROGRAMS

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:

- 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. The intent of this undertaking is to verify that appropriate traffic control signing (stop and yield signs) are in place, increasing safety for the traveling public.
- Erosion Control Standards - New standards should be established; locations where significant erosion issues exist should be identified and corrective measures should be developed and implemented. Recent project activity should be reviewed to determine the effectiveness of erosion measures, and methods to enhance erosion control on future projects should be explored.
- Update the 2011 Pine Ridge Emergency Operations Plan as needed.
- Future utilities should be planned and mapped to improve coordination with future transportation improvement projects.
- Non-paved roadway conditions survey - a methodology 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.
- Functional Classification Coordination - differences between the RIFDS and South Dakota Department of Transportation (SDDOT) functional classification maps should be addressed, with both systems updated accordingly.
- Complete a study of street lighting conditions and needs within OST towns and subdivisions.
- Complete a study and mapping of utility locations and conditions across the Reservation.
- Conduct a PASER Study of paved town and subdivision streets





CHAPTER 2 - INTRODUCTION

The Pine Ridge Indian Reservation is home to the Oglala Sioux Tribe (OST), located along the Nebraska border in southwestern South Dakota.

The OST 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 ranging 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). While the LRTP is comprehensive in nature, it is more of a system-level analysis than a detailed project-level 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 plan supersedes the July 2012 Oglala Sioux Tribe LRTP. It fulfills the requirements outlined in the November 7, 2016 Federal Register, 25 CFR Part 70, Tribal Transportation Program; 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 Tribal Transportation Program (TTP) funds, and to provide a strong basis to be used for grant funding applications submitted for multimodal transportation facilities.

The short-range element applies to the years 2018 through 2022. The long-range element applies to the years 2023 through 2043. The Federal Register suggests that this plan be updated every 5 years.

PLAN PURPOSE

Per the Code of Federal Regulations (CFR), the purpose of a Tribal LRTP is to clearly demonstrate a Tribe's transportation needs and to fulfill Tribal 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.

OST officials needed 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, transit, and aviation) and develop strategies and recommend projects to accommodate them. This





Plan examines the existing system of roads, sidewalks, bridges, transit and airport facilities and considers opportunities for future improvements.

- To review the current transportation system maintenance strategy and consider opportunities to improve it.
- 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 considers existing and potential funding sources, the costs of maintenance, rehabilitation, and new construction, and provides guidance on effective use of limited funding.

RECENT AND CONCURRENT STUDIES AND PLANS

This LRTP incorporates the analysis and recommendations contained in the Oglala Sioux Tribe 2016 Tribal Transportation Safety Plan (TTSP). It also incorporates the most current version of the TTIP. A study that was just starting while this report was being prepared was called the Gravel Pit Exploration Study.

The OST Emergency Management Director was contacted to obtain a copy of the most current emergency operations plan. The current plan is being reviewed and an update is planned for late 2018. The Oglala Sioux Tribe - Shannon County Multi-Hazard Mitigation Plan (MHMP) dated June 2014 was reviewed during this LRTP planning process.

According to that plan, the planning area is at risk from communicable disease, dam failure, drought, hazardous materials incidents, flooding, shallow landslide, urban fires, shortage of critical materials, summer storms, tornadoes, transportation crashes, winter storms, and wildfires. Many homes on the Reservation are inaccessible during periods of blizzards or heavy rain

The MHMP discusses each of these risks and the types of impacts that are likely, as well as possible mitigation opportunities. No specific transportation-related improvements were recommended by the MHMP.

The Plan also provides a list of high, medium, and low priority mitigation projects. Those pertaining to transportation include:

- Provide an Emergency Operations Plan
- Improve the Emergency Transportation System

An Emergency Operations Plan (EOP) typically covers evacuation plans available in case of emergency, as well as a multitude of provisions that will guide the Tribe in the event of an emergency (Refer to recommended studies at the end of this report).





STUDY AREA

The Study Area includes the entire Pine Ridge Indian Reservation located in southwestern South Dakota. It has approximately 3,469 square miles of land area and includes the entirety of Oglala Lakota County, the southern half of Jackson County, and Bennett County. It is the eighth-largest Indian Reservation in the United States.

Pine Ridge, Oglala, Martin, Kyle, and Wanblee are the largest communities on the Reservation. Pine Ridge, with a 2010 Census population of 3,308 is the Tribal headquarters of the OST. Other, smaller communities include Allen, Batesland, Long Valley, Manderson, Porcupine, Potato Creek, Red Shirt, Sharps Corner, Tuthill, Vetat, and Wounded Knee. There are 15 public schools and 3 private schools operating on the Reservation. Pine Ridge Airport is located two miles east of the town of Pine Ridge.

The OST has limited economic development or industry. Revenue from tourism and the Prairie Wind Casino (located near the west Reservation boundary) generate funds for the Tribe. The major employers include the Tribe itself, Oglala Lakota College, Indian Health Services, Bureau of Indian Affairs, and the Prairie Wind Casino.

The Oglala Sioux Tribe Department of Transportation (OSTDOT) is responsible for maintaining 485 miles of BIA roadways and 1188 miles of Tribal roadways within the Pine Ridge Indian Reservation. There are nearly 1000 miles of other federal, state, county, and other roadways within the Reservation. All these roads consist of nearly 2400 miles of gravel roads and over 500 miles of paved roads within the Reservation.

The study area is shown in Figure 2-1. It includes the region within the Pine Ridge Indian Reservation boundaries, which contains an existing population of about 30-40,000 people. The population is expected to remain stable or experience minimal growth. Most traffic growth is expected to occur because of more traffic traveling through the Reservation on the state highway system, or localized traffic increases associated with new developments.

The OST consists of 9 election districts for governance. The Tribal and government agency headquarters are in Pine Ridge. The study area includes the following federal and state highways. The current state-specified functional classifications are noted for each highway.

- US Highway 18 - Principal Arterial - Principal Arterial
- SD 73 (North of Tuthill) - Principal Arterial
- SD 407 (South of Pine Ridge) - Minor Arterial
- SD 391 (South of US Highway 18) - Minor Arterial
- SD 73 (South of Martin) - Minor Arterial

Figures 2-2 through 2-11 show enlarged aerial views of Allen, Batesland, Kyle, Manderson, Martin, Oglala, Pine Ridge, Porcupine, Wanblee, and Wounded Knee. Street names were taken from the 911 Addressing system.





SCENIC BYWAYS

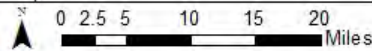
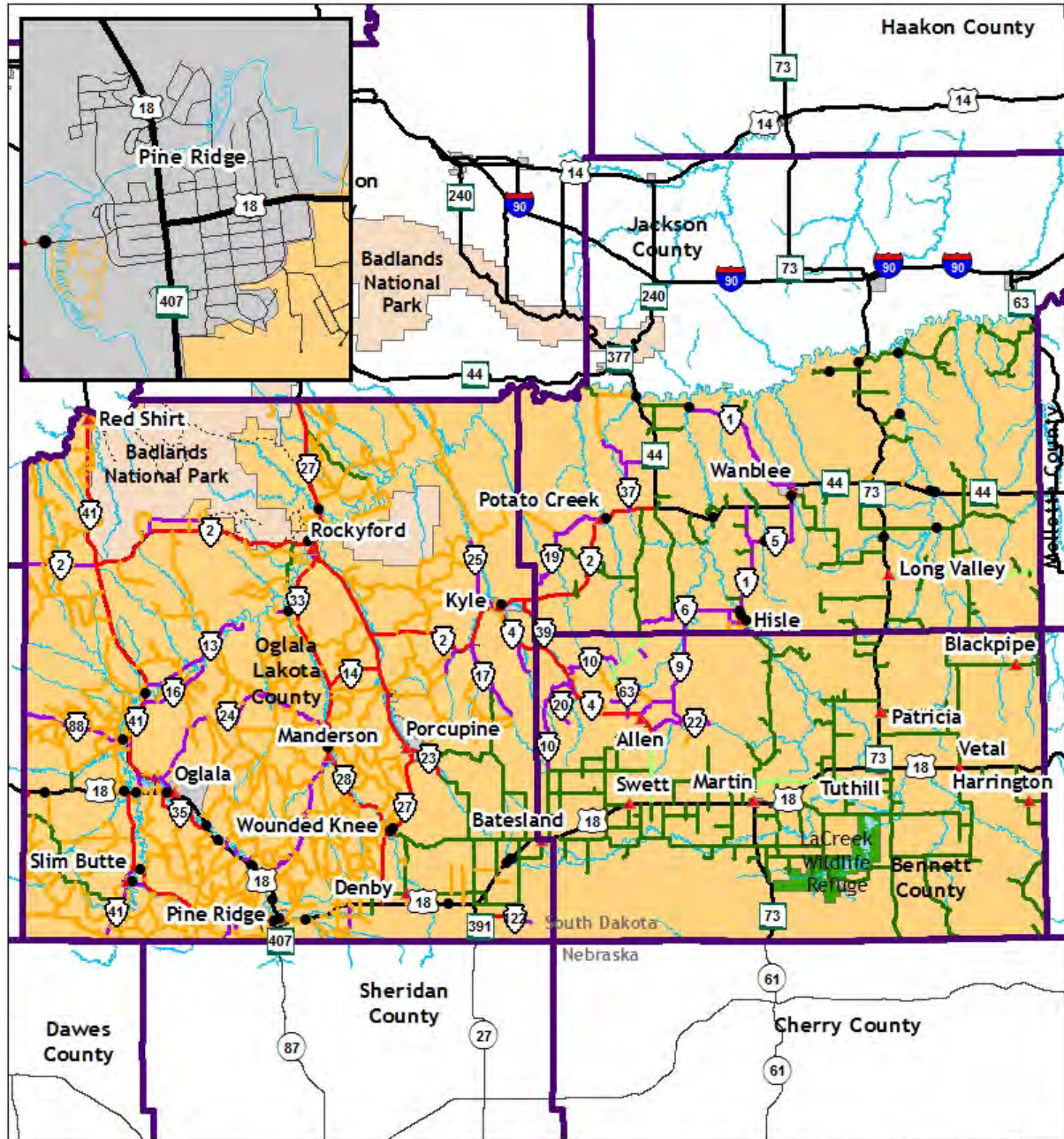
BIA 2, State Highway 44, and State Highway 73 serve as segments of the proposed Crazy Horse National Scenic Byway within the Pine Ridge Indian Reservation. As such, these routes have special importance from the standpoints of tourism and economic opportunities and should receive priority consideration for future funding to cover costs for maintenance, upgrades, and tourist amenities.

Alternatives to develop a future scenic byway on the Reservation are under consideration. Multiple routes have been discussed, including BIA 27, BIA 41, and others. Funded improvements and improved connectivity to cultural resources show promise to improve tourism and economic expansion within the Pine Ridge Indian Reservation.





FIGURE 2-1 - Study Area



- | | | | |
|-------------|----------------------------------|-----------------|-------------------------------|
| Counties | Reservation Roads by Type | County Unpaved | Lakes |
| Bridges | BIA Paved | IHS | Major Rivers & Streams |
| Cities | BIA Unpaved | Recreation Road | City Limits |
| State Roads | BIA Housing | Tribal Paved | Wildlife Refuges |
| | BIA-School | Tribal Unpaved | National Parks |
| | BIA Town | Tribal-Housing | Pine Ridge Indian Reservation |
| | County Paved | Urban | |





FIGURE 2-2 - Study Area - Allen

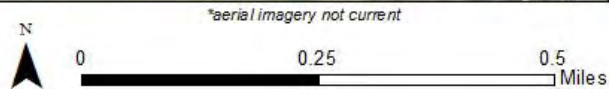




FIGURE 2-3 - Study Area - Batesland





FIGURE 2-4 - Study Area - Kyle





FIGURE 2-5 - Study Area - Manderson





FIGURE 2-6 - Study Area - Martin

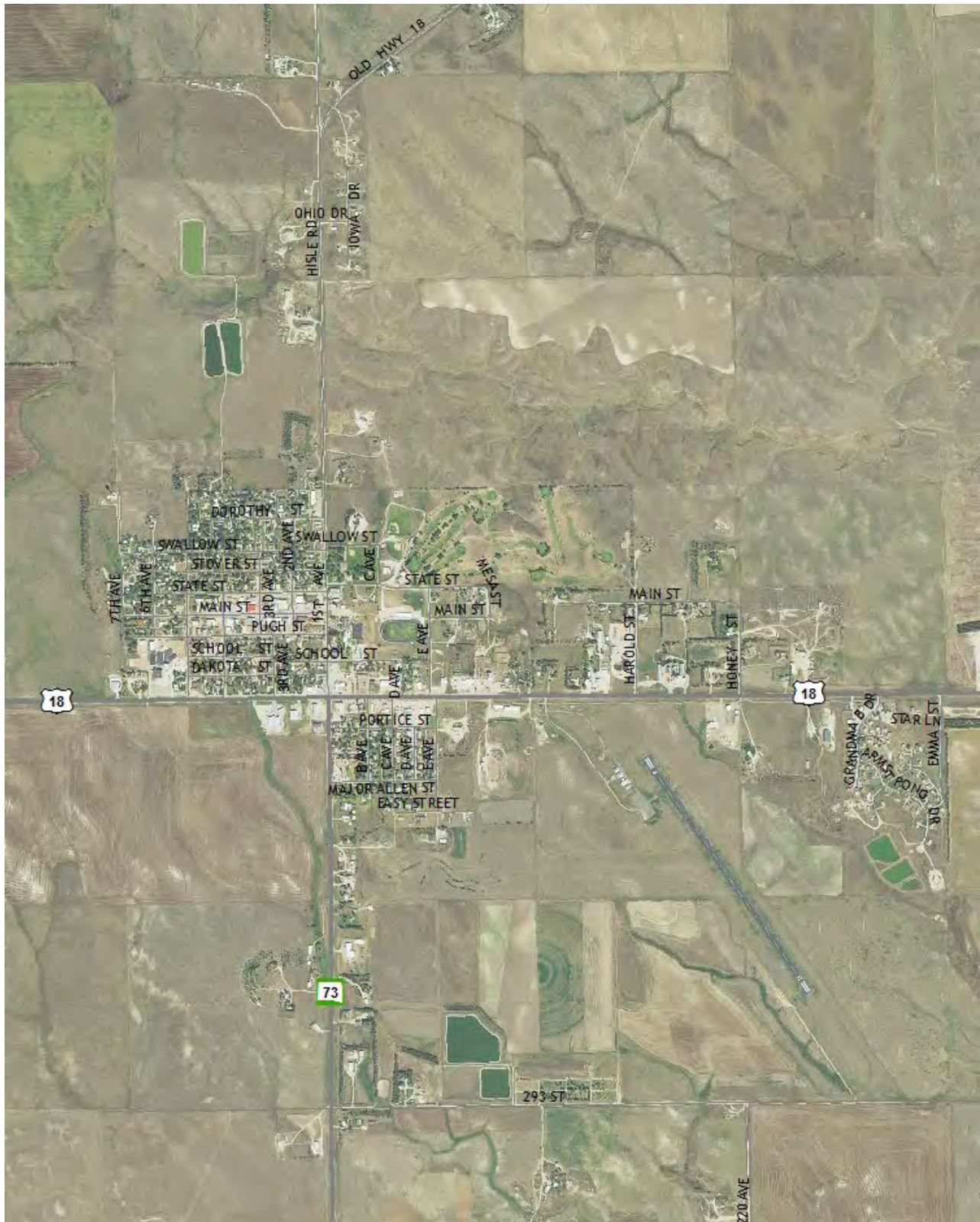




FIGURE 2-7 - Study Area - Oglala





FIGURE 2-8 - Study Area - Pine Ridge





FIGURE 2-9 - Study Area - Porcupine





FIGURE 2-10 - Study Area - Wanblee





FIGURE 2-11 - Study Area - Wounded Knee





CHAPTER 3 - EXISTING CONDITIONS

A transportation system evaluation was conducted to determine the breadth of transportation deficiencies and improvement opportunities within the study area. To complete this evaluation, available aerial photography and data inventories were analyzed and mapped using Geographic Information System (GIS) technology. Perhaps some of the greatest benefits of the plan development process was the preparation of mapped resources, which help 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

This section of the report discusses issues with the existing road inventory and proposes solutions to correct incongruences. It also addresses recommended roadway and shared-use path additions to the inventory. Strip maps and the full roadway inventory are available for review upon request.

ROADWAY OWNERSHIP

Figure 3-1 shows Tribal and Bureau of Indian Affairs (BIA) roads on the Pine Ridge Indian Reservation that are owned by the OST. There are also some roads owned and maintained by the SDDOT, Oglala Lakota, Jackson, and Bennett Counties. Roadway ownership is shown in Figure 3-2 and Figure 3-3. OSTDOT staff have researched BIA and County records and found evidence that some of these roads have either had their right-of-way records lost, or right-of-way was never properly acquired and filed.

The OSTDOT has made extensive efforts to verify with the BIA which roads have a dedicated and documented right-of-way. Those for which no records have been found will require efforts to establish new rights-of-way as road improvement projects are undertaken. This may require more lead time between project programming, development, and implementation.

FUNCTIONAL CLASSIFICATIONS AND INVENTORY

Functional classification refers to a hierarchy of roads. It supports the concept that roads are designed for different purposes. Primary and secondary state highways or 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 at the expense of higher speeds or high traffic volume.





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 identified as arterials. Volume alone does not determine arterials. It is desirable that residents can travel north/south and east/west across the Reservation on arterials or major collectors and communities like Pine Ridge are connected to other towns within the Reservation and beyond with arterial roads.

The OST cannot maintain all paved roads in top condition unless significantly more funding is found. Therefore, future priority for maintenance on any road should generally be given to arterials, followed by collectors, then local roads, parking, and other paved facilities.

The state highways and some key BIA routes will continue to serve regional trips entering and exiting the Reservation. Other highways are planned to serve shorter distance trips based on classification. Functional classifications from the National Tribal Transportation Facility Inventory found in the Road Inventory Field Data System (RIFDS) are shown in Figure 3-1.

This functional classification map differs significantly from the one maintained by the SDDOT. Efforts to resolve differences between the two maps are ongoing and resolving them may be beneficial for future planning activities. These efforts should be completed, and ideally will result in more clarity regarding which roads should receive higher priority for maintenance and upgrades. It is anticipated that through this process, some routes will be added, and some routes may be upgraded in classification from what is currently shown on the SDDOT's functional classification system.

RIFDS INVENTORY ADDITIONS

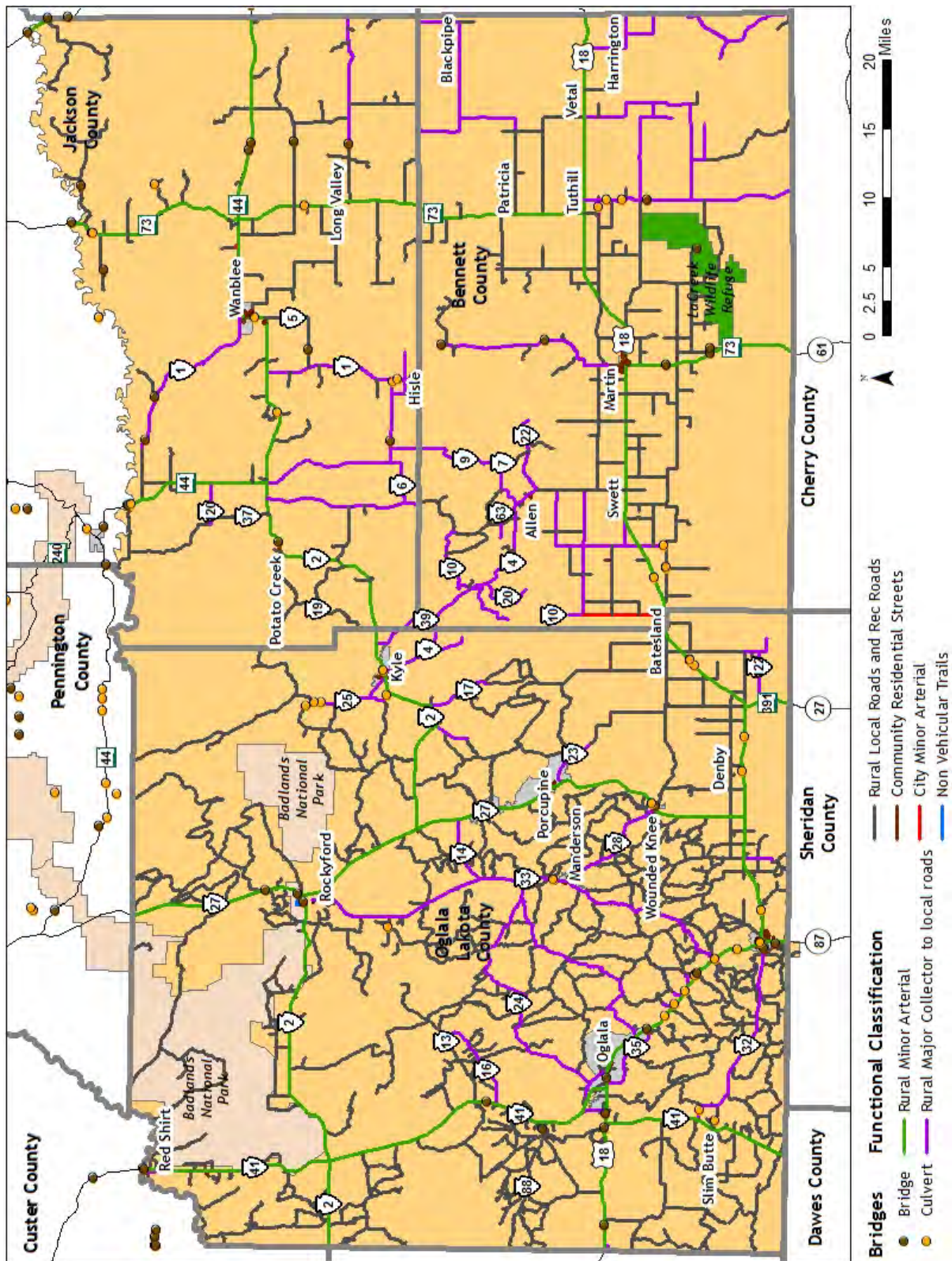
When existing transportation facilities are changed, or new ones are added, it is important to update RIFDS to reflect those changes. During 2018, some updates to RIFDS were undertaken. These included:

- The proposed shared use path along SD 407
- The planned shared use path near Kyle.
- Shared use path modifications in Manderson.
- Updates to BIA 4 through Allen and addition of the shared use path
- While all Tribal roads are school bus routes, they do not all show up as bus routes in RIFDS. This will be changed, as routes on school bus routes may receive preference for grant funding.
- No parking lots are expected to be added to the inventory at this time.
- Updates to previous reconstructed or rehabilitated routes





FIGURE 3-1 - Roadway Functional Classifications





Based on RIFDS, roadway ownership by functional classification is shown in Figure 3-2.

FIGURE 3-2 - Roadway Ownership and Functional Classification

	Major Arterial (1)	Rural Minor Arterial (2)	City Local (3)	Rural Major Collector (4)	Rural Local (5)	City Minor Arterial (6)	City Collector (7)	Trail (8)	Parking Lot (9)	Totals
Ownership										
BIA	0.0	160.9	0.9	245.6	77.7	0.0	0.0	0.0	0.1	485.2
Tribal	0.0	0.0	6.7	17.7	1156.2	0.5	0.0	6.5	0.4	1188.1
State	0.0	107.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	107.1
Urban	0.0	0.0	11.9	0.0	0.0	0.0	0.0	0.0	0.0	11.9
Other Federal	0.0	100.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.7
Other BIA Offices	0.0	0.0	33.9	1.0	1.0	0.0	0.0	0.0	0.3	36.2
County	0.0	0.0	0.2	158.0	552.2	6.0	0.0	0.0	0.0	716.4
Subtotals	0.0	368.7	53.6	422.4	1787.1	6.5	0.0	6.5	0.8	2645.5
Proposed	0.0	77.4	0.0	64.7	120.6	0.0	0.0	10.3	0.4	273.4
Totals	0.0	446.1	53.6	487.0	1907.7	6.5	0.0	16.8	1.2	2918.9

Based on RIFDS data, roadway ownership and surface types are shown in Figure 3-3.

FIGURE 3-3 - Roadway Ownership and Surface Types

	Proposed (0)	Earth/Dirt (1)	Gravel (3)	Asphalt <2" (4)	Asphalt >2" (5)	Concrete (6)	Primitive (9)	Totals
Ownership								
BIA	0.0	150.0	99.7	28.0	207.0	0.3	0.3	485.2
Tribal	5.2	1029.0	14.6	0.0	5.0	0.9	133.4	1188.1
State	0.0	0.0	3.1	0.0	103.5	0.5	0.0	107.1
Urban	0.0	0.0	2.5	1.3	8.2	0.0	0.0	11.9
Other Federal	0.0	0.0	0.0	0.0	94.3	6.4	0.0	100.7
Other BIA Offices	0.0	2.5	4.6	1.2	25.7	2.1	0.0	36.2
County	0.0	243.0	431.0	0.0	42.4	0.0	0.0	716.4
Subtotals	5.2	1424.5	555.4	30.5	485.9	10.2	133.8	2645.5
Proposed	273.4	0.0	0.0	0.0	0.0	0.0	0.0	273.4
Totals	278.6	1424.5	555.4	30.5	485.9	10.2	133.8	2918.9





TRANSPORTATION FACILITY CONDITIONS

This section of the report examines the existing conditions prevalent within the transportation facilities on the Reservation. Facilities addressed include paved and non-paved roadways, freight and trucking, bridge, pedestrian and bicycle facilities, airport, transit, and utilities.

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: Every year for paint, 2 years for cold applied pavement markings

PAVED ROADWAY CONDITIONS

The OSTDOT staff inherited road surface conditions that were far behind desired levels of maintenance. Also, some roadways constructed around a decade ago were done without proper quality control and compaction testing and they are now failing. Some were constructed on poor subgrade and now require reconstruction.

Given current funding levels and the extensive number of miles the OST needs to maintain, poor road surface conditions will remain an issue on many BIA and Tribal roads for the foreseeable future. However, progress is being made to bring the paved highway system to a point where ongoing maintenance can avoid costly reconstruction. Pictures of paved roadway surface conditions prevalent on Pine Ridge Indian Reservation roads are shown in Figures 3-4 and 3-5.

FIGURE 3-4 - Paved Roadway Conditions

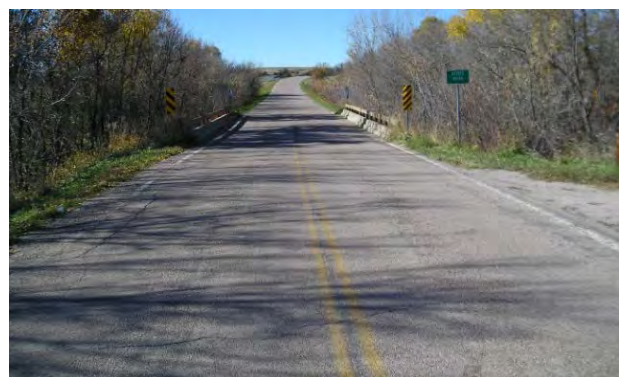
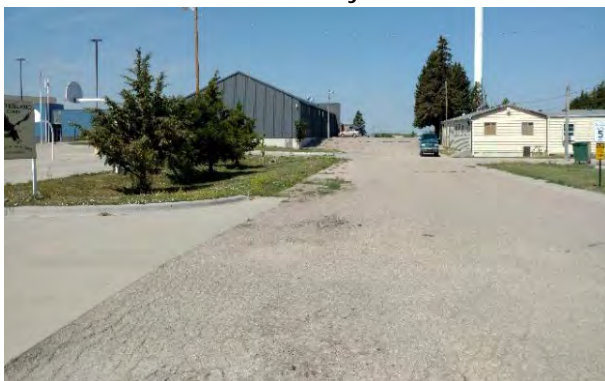




FIGURE 3-5 - Paved Roadway Conditions



Pavement Improvement History

Understanding the history of pavement improvements along a given section of road is the first step in defining when the next improvements should be considered. A search of available records as far back as 2008 was conducted to determine the history of pavement improvement on BIA roads within the Reservation. Figure 3-6 shows the type of repair most recently completed on paved BIA roads. Figure 3-7 shows the year the improvements were completed.

A review of the pavement improvement history indicates that many of the paved roads are due for a seal coat project, at a minimum. By 2020, for most paved roads on the Reservation it will have been 10 years or longer since the most recent seal coat or patching project. This is concerning, as continued delay in seal coats can result in a hastened drop in pavement conditions and some of these pavements may deteriorate to a point where they need more expensive repairs.

The next section of the LRTP covers a more in-depth analysis of pavement conditions. This is necessary, as an assessment of actual field conditions tells more about pavement conditions and the type of improvements that are needed than does an understanding of historical improvement projects.





FIGURE 3-6 - Paved Roadway Repair Type by Year

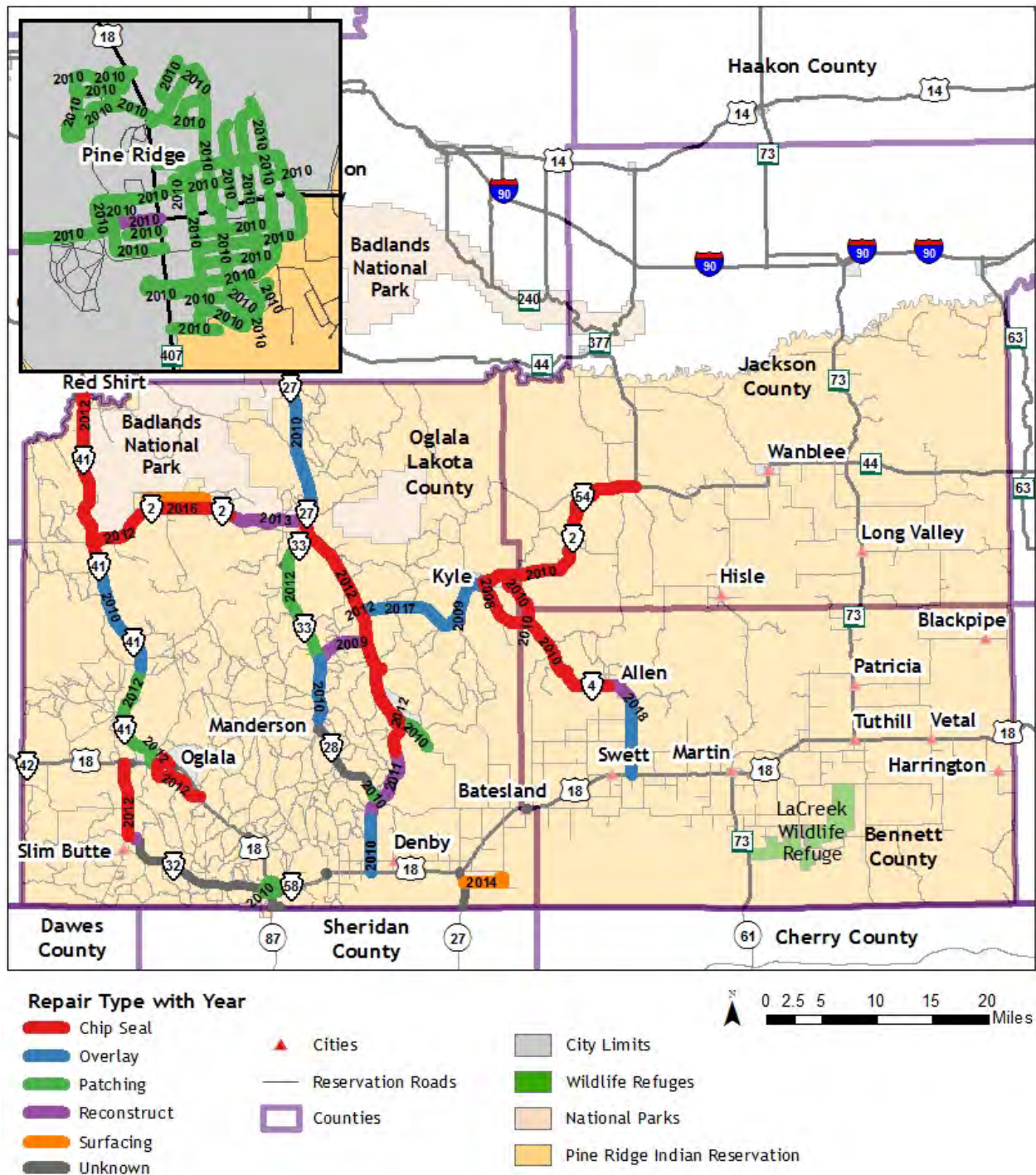
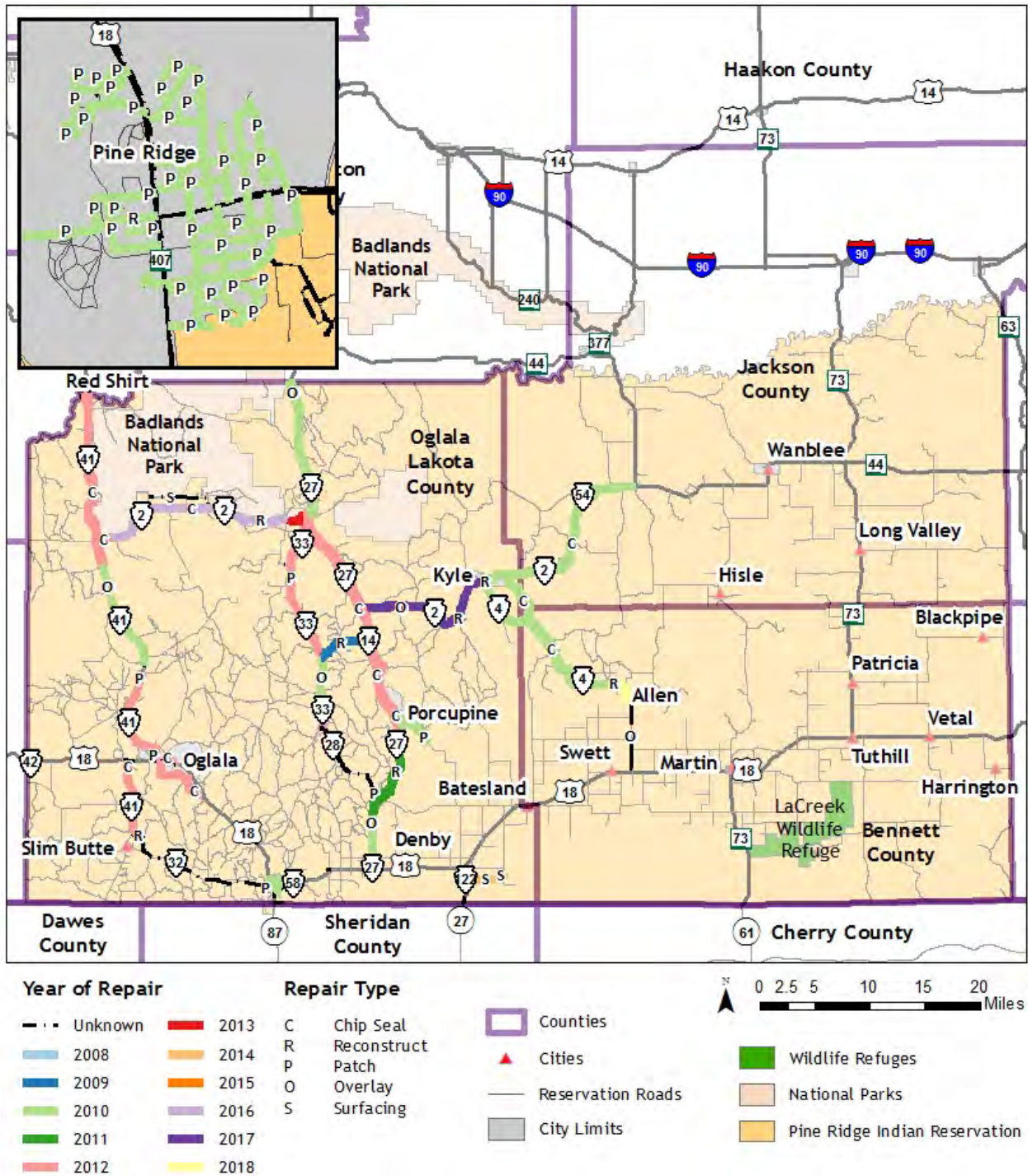




FIGURE 3-7 - Paved Roadway Repair Type by Year





Pavement Surface Evaluation and Rating (PASER)

Roadway surface types and conditions were the most frequently cited area of concern by those who attended the public meetings. 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. Most of the TTP funds the OST spends goes to maintaining, rehabilitating, or reconstructing the paved BIA roads.

PASER is a visual method, based on engineering principles, for evaluating paved roads in a time efficient and consistent manner. The PASER method outputs a simple 1 through 10 rating for each section of roadway studied. This provides an understandable way for an agency to communicate pavement condition to elected officials and the public, and it also allows more time to be put towards scheduling and budgeting.

PASER ratings were prepared and updated through 2018 to assist the OST in identifying paved roadway conditions and prioritizing improvements based on a range of factors including roughness (ride), surface distress (condition), surface skid characteristics, and structural characteristics (potholes, cracking, etc.).

The PASER ratings do not account for existing road cross section including, width, shoulders, side slopes, overall road geometry, or areas of safety concerns. It is noteworthy that this effort was only conducted on paved BIA highways. It would be beneficial to also conduct this effort on other paved Tribal roads within the Reservation at a future date.

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, the life of a roadway 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 and given a rating of between 1 and 10. 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. Instances of shorter segments were also noted if conditions differed suddenly. 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 six and each instance of severe cracking was rated as a six consistently. The individual PASER ratings values are described in the following paragraphs.





PASER Rating of 1:

There were no paved roadways in the study area with a PASER rating 1. If there were, however, it would essentially be a gravel road, and the Tribe would have to determine if a full reconstruction is needed or if it is to remain gravel.

PASER Rating of 2:

Due to severe deterioration, the roadway needs extensive base repair; or the decision can be made to pulverize any remaining asphalt and maintain it as a gravel road. There were no roadways in the study area with a PASER rating 2.

PASER Rating of 3:

There were 11.0 miles of roadway that received a PASER rating of 3. This occurred along sections of BIA 33 and BIA 35. Patching and repair should be done prior to a structural overlay (greater than 2"). Milling and removing the deteriorated area will extend the life of the overlay.



PASER Rating of 4:

Due to significant signs of aging, a structural overlay is required (greater than 2"). There were 6.3 miles of roadway that received a PASER rating of 4. This occurred along sections of BIA 4 and BIA 33.





PASER Rating of 5:

Primarily consists of aging asphalt, but with sound structural conditions. The roadway can benefit from patching where necessary, followed by a non-structural overlay (less than 2"). There were 29.4 miles of roadway that received a PASER rating of 5.



PASER Rating of 6:

Light signs of aging. The roadway life can be extended with routine crack sealing and a sealcoat. There were 61.0 miles of roadway that received a PASER rating of 6.





PASER Rating of 7:

Roadway shows very few signs of aging and can be maintained with routine crack filling. There were 39.3 miles of roadway that received a PASER rating of 7.



PASER Rating of 8 and 9:

No immediate maintenance needs are apparent on these roadways, although, they should be included on the schedule for crack sealing and seal coats. In the future, that maintenance should be performed to continue to extend the life of the roadway. There were 44.1 miles of roadway that received a PASER rating of 8 and 9.



PASER Rating of 10:

This roadway was recently completed, and no maintenance is required at this time. There were 42.0 miles of roadway that received a PASER rating of 10.





PASER Results Summation

When assessing pavement conditions and scheduling needed improvements, it is not as easy as simply looking at the lower scoring roads and saying that they are in the worst condition; therefore, have the most need. Other factors such as car and truck traffic volumes, capacity of the roadway to handle those volumes, roadway safety, maintenance history, functional classification, geometric sufficiency, and other factors should be considered.

Traffic volumes may be considered when developing a pavement management plan. However, in the case of the roadways studied on the Reservation, only nine roads have an average daily traffic (ADT) volume over 1000 vehicles per day (see pages 56-58 for a detailed discussion of traffic conditions within the Reservation). While traffic volumes should still be considered, because there is a difference between a road that has over 1,000 ADT and one that has under 100 ADT, level of service is not a factor that can help determine need in this case. KLJ did not conduct traffic counts, but used traffic counts available on the SDDOT website, or counts provided by the OSTDOT that were gathered from 2006 to 2016.

Figure 3-8 shows the number of miles of BIA paved roads receiving each PASER score between 1 and 10. Planned improvements for 2018 have been accounted for. Scores of 1 or 2 represent reconstruction, 3 or 4 represents reconstruction or structural overlays, 5 or 6 represents non-structural overlays or seal coat, 7 or 8 represents routine crack sealing and maintenance, and 9 or 10 no maintenance is required at this time. It is noteworthy that some roads that fall within a given category may require more significant improvements than the PASER rating suggests. Issues such as limited shoulder width, steep in slopes, sharp curves, or other features not evident from the PASER analysis can lead to more expensive corrective measures.

Figure 3-8 - PASER Results Distribution

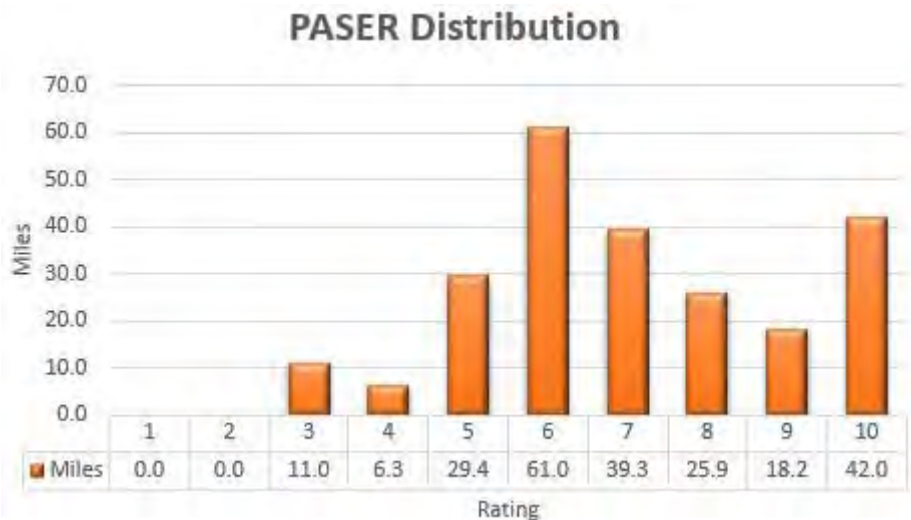
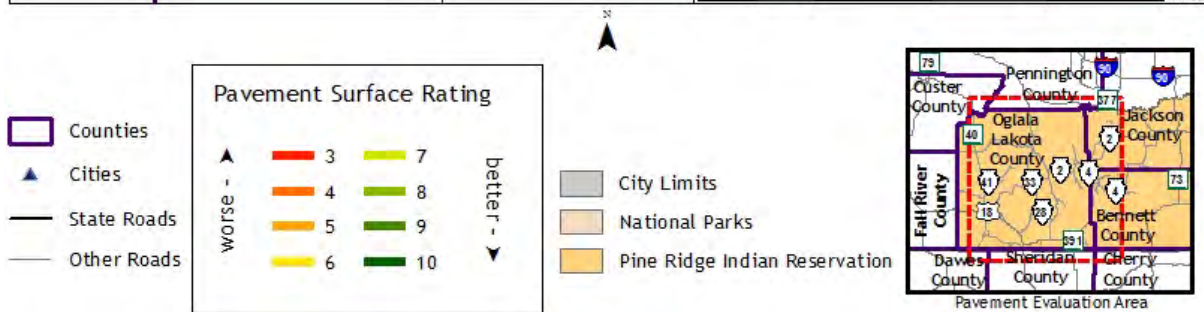
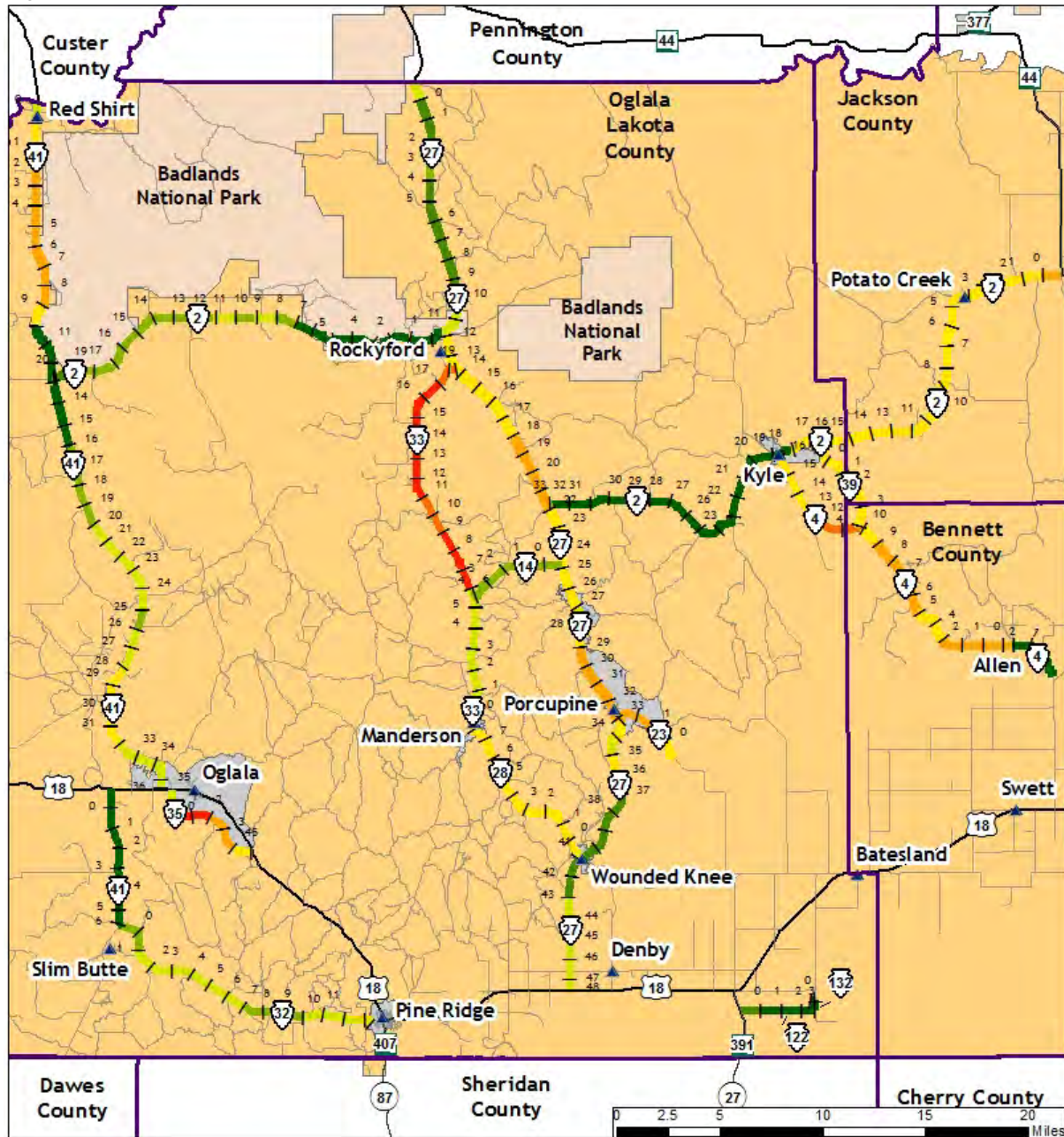


Figure 3-9 shows how each paved road included in the analysis were rated and accounts for improvements that were scheduled to be completed in 2018.





Figure 3-9 - Pavement Surface Conditions on Paved BIA Roads



NON-PAVED ROADWAY SURFACE CONDITIONS

There is limited documentation available regarding the condition of non-paved roadway surfaces within the Reservation. The condition of non-paved roadways within the Reservation varies significantly. KLJ observed that numerous roads lack a crown or proper drainage, so they are severely impacted during even minimal rainfall events.

Most have received little or no surfacing and are earthen or primitive in nature. Issues with non-paved roadways include being too narrow, limited or no surface aggregate, poor cross section, lack of proper ditches and drainage, rutting, and dust. Pictures of non-paved roadway surface conditions prevalent on Pine Ridge Indian Reservation roads are shown in Figure 3-10. A discussion of current maintenance efforts, opportunities, and challenges is provided later in this report.

FIGURE 3-10 - Non-Paved Roadway Types and Conditions





FREIGHT AND TRUCKING CONDITIONS

Freight is defined as the movement of goods. The efficient movement of goods is a fundamental prerequisite for growth in jobs and a strong economy. Trucking is the only means of freight movement within the Reservation, as no railway facilities are present, and the Pine Ridge Airport is not typically used for hauling freight.

Truck traffic data is available on the US and State Highway systems. Year 2016 daily truck traffic on US Highway 18 was in the range of 88-191 vehicles per day, with the higher volume located just west of Pine Ridge, and the lowest volume located on the east side of Bennett County.

Truck traffic data was also available on SD 407 south of Pine Ridge (64 trucks/day), Highway 391 south of US Highway 18 (70 trucks/day), Highway 73 south of Martin (167 trucks/day), and Highway 73 north of US Highway 18 (160 trucks/day). Since 2008, truck volume data on the rest of the Reservation road system has been unavailable.



Concerns have been raised regarding trucks exceeding the load limits. The hauling of hazardous materials is also a potential issue associated with hauling of freight. The OSTDOT requires haul permits for construction projects. 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.

BRIDGE AND CULVERT CONDITIONS

An inventory of existing bridges and culverts on the paved roadway system is shown in Figure 3-11. There are 25 structures listed in the National Bridge Inventory that includes bridges and culverts 20-feet wide or wider.

Additionally, there are hundreds of culverts varying in size and material that are on the Reservation. Most locations and conditions are unknown, though some have experienced catastrophic failure in the past, resulting in roads caving in. The OSTDOT has begun an inventory of their culverts. This is a high-level need, so existing failures can be addressed, and so bad culverts can be fixed before they fail.



Many of the bridges on the Reservation serve few residents and carry very low volumes of traffic. Because of this, many of these bridges will have reduced success when competing for





funding. Yet, these bridges are important because, in many cases, they serve as the only viable access to properties.

The results of inspection reports dated November 2017 are summarized in Figure 3-12. Bridges need improvements when they either become functionally obsolete or structurally deficient. A functionally obsolete bridge is one where the design is not suitable for its current use. Bridges may have lower load carrying capacity, narrower shoulders, or less clearance underneath than current design standards require. A lack of safety shoulders or the inability to handle current traffic volumes, speed, size, or vehicle weights may be causes for a functionally obsolete bridge.

A structurally deficient bridge is one having a bridge deck, superstructure, substructure, or culvert that is rated in “poor” condition. It includes a significant defect, which often means speed or weight limits must be put on the bridge to promote safety. It likely means that the load carrying capacity of the bridge is significantly below current design standards or can mean a waterway frequently overtops the bridge during floods.

Ratings shown in the figure ranging from 7 to 9 indicate good conditions, ratings ranging from 4 to 6 indicate moderate deterioration, and below a rating of 4 indicates poor to failing conditions.

Currently, deficient bridge conditions have been identified for the following bridges:

- A122 - Sufficiency rating of 36.7
- A133 - Sufficiency rating of 56.5
- A154 - Sufficiency rating of 54.0
- A155 - Sufficiency rating of 47.1



Additionally, a detailed list of bridge maintenance needs covering the entire bridge system has been provided to the OSTDOT. A summary of bridge maintenance needs and costs is provided later in this report. It is expected that over time and as future bridge inspections are completed, the conditions of more bridges will deteriorate to the point where they will require expanded maintenance or replacement.





FIGURE 3-11 - Existing Bridge and Culvert Structure Locations

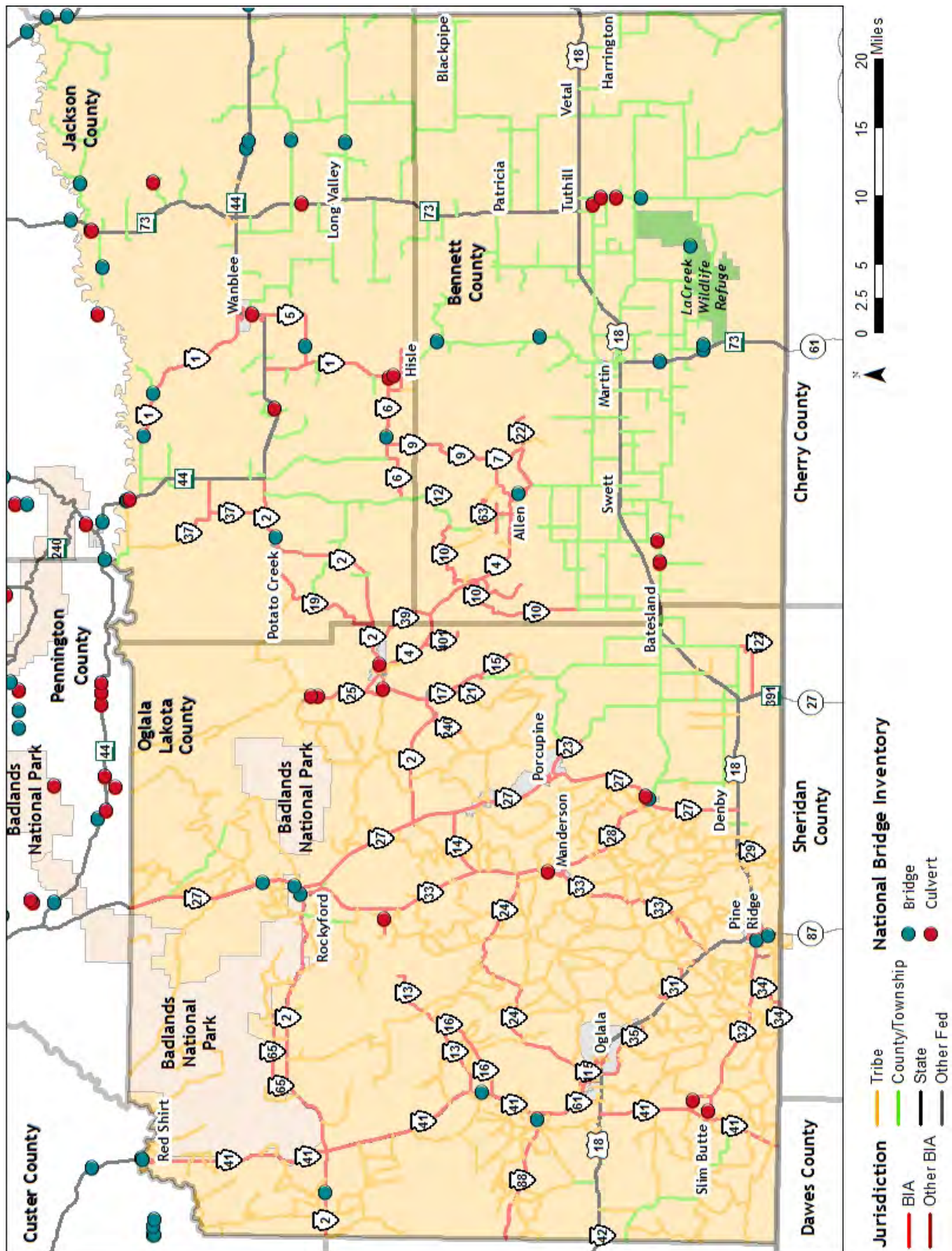




FIGURE 3-12 -2017 National Bridge Inventory - Bridge Conditions

Structure Number	Feature Intersected	BIA Route Number	Location	Surface Type	Surface Condition	Length (Feet)	Superstructure Rating	Substructure Rating	Channel Protection Rating	Culvert Rating	Inspection Date
A021	COTTONWOOD CREEK	27	8 KM NORTH OF ROCKYFORD	AC Pavement	Minor	561	7	7	5	N	11/2/2017
A023	WHITE RIVER	2	4.3 KM NW OF ROCKYFORD	AC Pavement	Minor	878	6	6	7	N	11/2/2017
A028	POTATO CREEK	2	8.9 KM WEST OF SD HWY 44	AC Pavement	Smooth	213	7	6	6	N	11/1/2017
A103	WHITE RIVER	41	19.3 KM NW OF OGLALA	AC Pavement	Minor	524	6	7	6	N	11/2/2017
A112	WHITE RIVER	27	4 KM N OF ROCKYFORD	AC Pavement	Minor	610	6	7	6	N	11/2/2017
A115	BEAR IN THE LODGE CREEK	1	8 KM S 7.2 KM E INTERIOR	Gravel	Rough	436	7	7	6	N	11/1/2017
A116	EAGLES NEST CREEK	1	14.5 KM SE OF INTERIOR	Gravel	Minor	323	7	6	7	N	11/1/2017
A122	CORN CREEK	6	21 KM NE OF ALLEN	Gravel	Minor	64	4	5	7	N	11/1/2017
A129	MEDICINE ROOT CREEK	2	0.5 KM EAST OF KYLE	AC Pavement	Smooth	97	N	N	5	6	11/1/2017
A130	WHITE RIVER ROUTE 27 DRAIN CHANNEL	3202	10 KM EAST OF SLIM BUTTE	Gravel	Minor	87	N	N	5	6	11/2/2017
A133	WHITE CLAY CREEK	49	0.2 KM E OF RTE 27&28 JCT	AC Pavement	Pothole	62	6	6	7	N	11/3/2017
A136	WOUNDED KNEE CREEK	36	0.3KM E OF OGLALA SCHOOL	Concrete	Smooth	323	7	7	7	N	11/2/2017
A144	WOUNDED KNEE CREEK	33	2.6KM N OF MANDERSON	AC Pavement	Smooth	73	N	N	7	9	11/3/2017
A145	WOUNDED KNEE CREEK	8	1.3KM W OF BIA ROUTE 33	Gravel	Minor	73	N	N	8	8	11/2/2017
A147	BEAR IN THE LODGE CREEK	6	1 KM N OF HISLE	Gravel	Minor	73	N	N	8	9	11/1/2017
A148	BEAR IN THE LODGE CREEK	1	0.5 KM N OF HISLE	Gravel	Minor	73	N	N	8	9	11/1/2017
A153	WOUNDED KNEE CREEK	27	0.7KM NE OF RTES 27 & 28	AC Pavement	Smooth	73	N	N	8	7	11/3/2017
A154	WHITE RIVER	88	10KM NE OF OGLALA	Dirt	Rough	519	4	4	7	N	11/2/2017
A155	WHITE RIVER	90	1.4KM SOUTH OF BIA RTE 18	Dirt	Minor	101	6	7	6	N	11/2/2017
A156	WHITE RIVER	32	12.3KM SW OF OGLALA	AC Pavement	Smooth	78	N	N	8	8	11/2/2017
B00157	MEDICINE ROOT CREEK	25	9.7KM NW OF KYLE	Gravel	Smooth	78	N	N	8	7	11/3/2017
B00158	MEDICINE ROOT CREEK	25	8.1KM NW OF KYLE	Gravel	Smooth	78	N	N	8	8	11/3/2017
B00159	AMERICAN HORSE CREEK	25	3.1KM SW OF KYLE	Gravel	Smooth	78	N	N	8	8	11/3/2017
B0160	SQUAW CREEK	2	5.0KM WEST OF BIA 41	Gravel	Minor	192					
B0161	BEAR IN THE LODGE CREEK	4	0.3KM S OF ALLEN SCHOOL	AC Pavement	Smooth	258					





PEDESTRIAN AND BICYCLE FACILITY CONDITIONS

Walking and biking is an important component of the Tribal transportation system. Enhancing the ability to walk or bike involves not only providing the infrastructure but also linking design, streetscapes and land use to encourage walking and biking. Safety is also critical when developing an appealing pedestrian and bicycle network. According to national studies, pedestrians represent a disproportionate percentage of road-related fatalities, and thus, special focus should be given to addressing these safety concerns.

A substantial amount of pedestrian and bicycling activity within the Reservation occurs along the roads. Some sidewalks are available in Allen, Batesland, Kyle, Manderson, Martin, Oglala, Pine Ridge, Porcupine, and Wanblee (See Figures 3-13 through 3-21.) Wider, shared use paths exist along US Highway 18 in Pine Ridge (2.0 miles), along of sections of US Highway 18 and BIA 41 (Loneman Road) in Oglala (2.7 miles), about 1 mile in length along BIA 4 in Allen, about ¼ mile in length along 1st Avenue in Martin, and about ½ mile in length along SD 44 in Wanblee. Another 1 mile of shared use path will be constructed in Kyle in 2019.



There are many locations within the Reservation that are not served by sidewalks or paved shared-use paths. Additionally, there are many gaps in the system. Beyond provision of sidewalks and paved shared use paths, construction of wider shoulders in street design is another method of providing pedestrian and bicycle facilities. This method is most useful along highways where heavier bike or pedestrian use is expected but where separated facilities are not likely to be installed. An example of this occurs along BIA 2 from BIA 41 to BIA 27, which has a 6-foot shoulder on the north side to accommodate bikes.

The condition of the sidewalks on the Reservation varies, though many of them are in good condition. Some sidewalks have settled, have trip hazards or other issues associated with disrepair. Some pedestrian facilities are not compliant with the Americans with Disabilities Act (ADA). This typically occurs because of poor ramp design or a lack of ramps at intersections.



Each town across the Reservation would benefit from installation of sidewalks and/or shared-use paths. To provide a list of top priority locations, the following nine towns were evaluated.

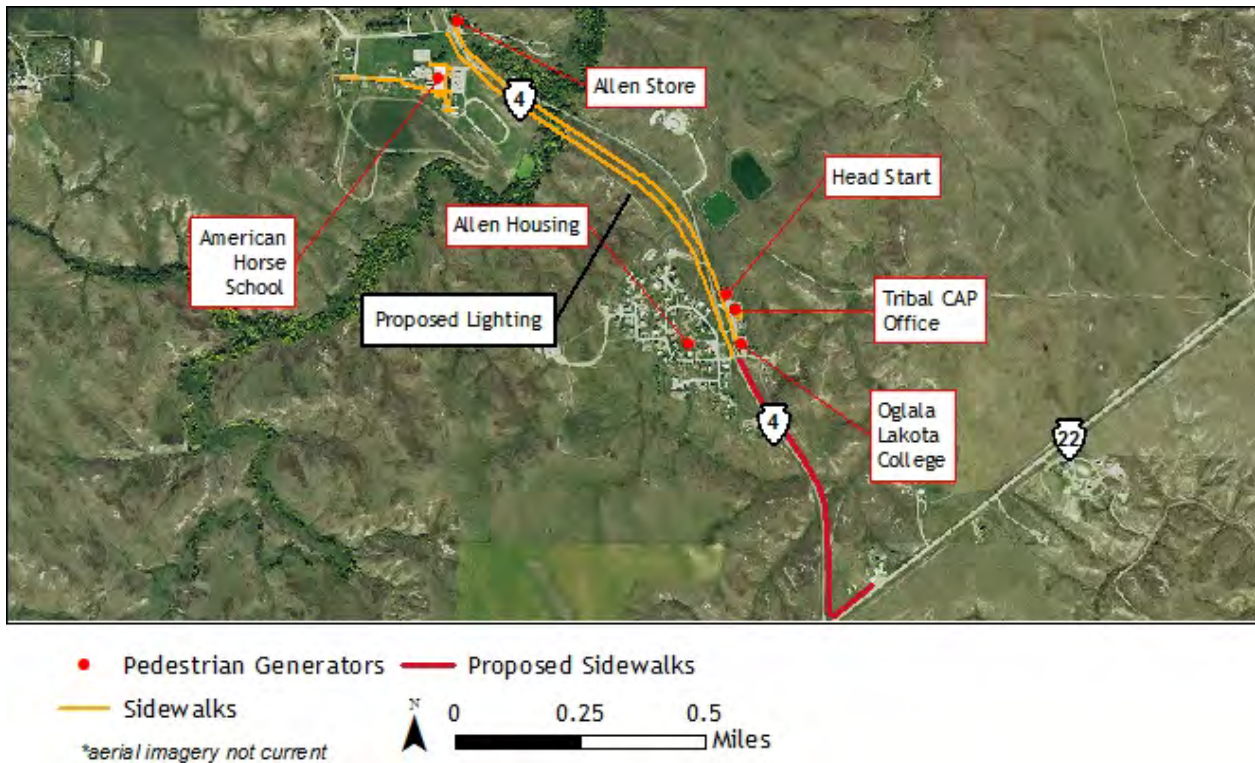


Allen Sidewalks

Sidewalks currently exist near the school in Allen. A shared use path was recently completed along BIA 4 (Allen Road). It connects to existing sidewalks at American Horse School, the Tribal CAP Office, and Oglala Lakota College. Tribal Transportation Program Safety Funds have been requested for lighting along this path.

The proposed, lighted path will provide needed accessibility between the Allen residents and key businesses and establishments in Allen. These facilities will also enhance safety for those who travel along or across BIA 4.

FIGURE 3-13 - Existing and Proposed Sidewalks - Allen





Batesland Sidewalks

A few sidewalks have been constructed near the Batesland Elementary School. Batesland would benefit greatly from sidewalks connecting the Elementary School and College Center to subdivisions located along the north side of US Highway 18.

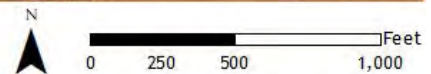
They could also tie into the Batesland Handi Stop Service Center located in the SW corner of the Cedar Street/US Highway 18 intersection and improve access to the Post Office. The presence of higher traffic and travel speeds along US Highway 18 would also benefit from designated crossing locations, crosswalks, and possibly flashing beacons.

FIGURE 3-14 - Existing and Proposed Sidewalks - Batesland



Pine Ridge Reservation Sidewalks - Batesland

- Pedestrian Generators
- Proposed Sidewalks
- Sidewalks





Kyle Sidewalks

Numerous sidewalks have been constructed in Kyle, and they provide connections to many pedestrian generators, such as Little Wound School and the Kyle Health Center. Most of the town of Kyle is within a few short blocks walking distance to a sidewalk connection.

Further sidewalk extensions along BIA 2 and an improved crossing of BIA 2 in front of the Oglala Lakota College and improved intersection with crosswalks at BIA 4 and the Little Wound School were identified as needed improvements. Shared use path upgrades and expansion along the south side of BIA 2 from hospital housing to the Kyle Grocery are planned for construction in 2019. A TTPSF grant for lighting improvements along BIA 2 has been applied for.

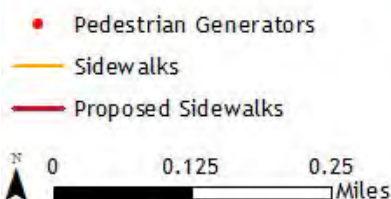
FIGURE 3-15 - Existing and Proposed Sidewalks - Kyle



Manderson Sidewalks

Existing sidewalks in Manderson are limited to the immediate vicinity of Wounded Knee District School. Placement of a shared use path is needed along BIA Highways 28 and 33, from the Head Start building to Oglala Lakota College. Extension of sidewalk facilities from the shared use path to the Post Office, Wounded Knee District School, Pinky’s Store, and the transit shelter would provide connectivity and enhance safety between key land uses and the primary residential developments in Manderson.

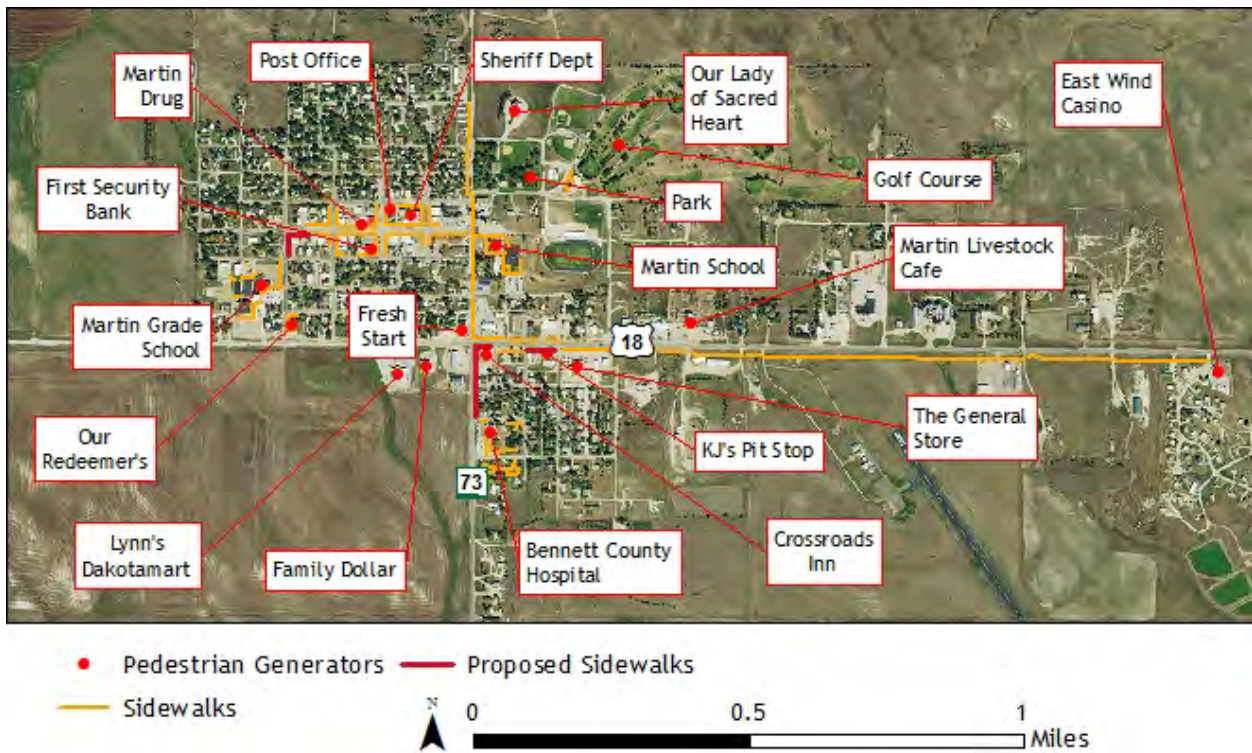
FIGURE 3-16 - Existing and Proposed Sidewalks - Manderson



Martin Sidewalks

Most residents within the town of Martin are located within a few blocks of the sidewalk network. There are a few gaps in the network, specifically along 5th Avenue and Main Street that could connect to the Martin Grade School, and along US Highway 18 and County Highway 73. Construction of these sidewalks is important because they will enhance safety and improve access by pedestrians to both Martin Grade School and the Bennett County Hospital.

FIGURE 3-17 - Existing and Proposed Sidewalks and Shared-Use Paths - Martin



Oglala Sidewalks

Oglala has a paved shared use path that extends along the north side of US Highway 18 from the east side of town, to where it turns north along BIA 41 and extends to Loneman School. There are also sidewalks that extend from the school south to the adjacent subdivision. A sidewalk extension along BIA 115 is needed to connect a major subdivision and a recreation center to the rest of the existing sidewalk system.

FIGURE 3-18 - Existing and Proposed Sidewalks and Shared-Use Paths - Oglala



Pine Ridge Sidewalks

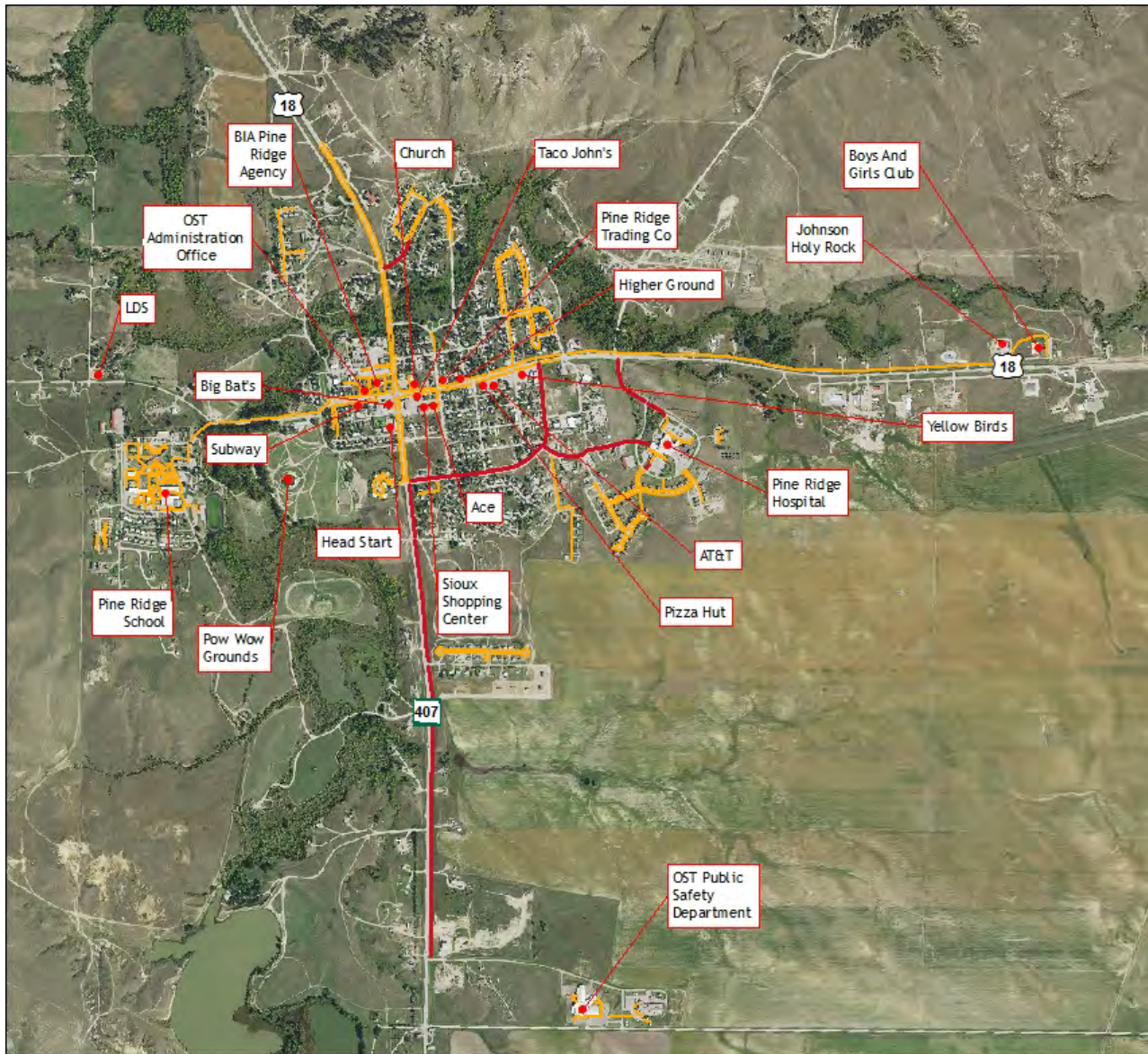
The town of Pine Ridge has shared use paths and sidewalks that extend along the major highways, near the Pine Ridge School and Hospital, and to a very limited degree in the residential neighborhoods. The SDDOT has programmed curb ramp replacements along US Highway 18 from Whitetail Deer Road to the US Highway 18/SD 407 intersection.

Additional sidewalks to provide better connectivity to the hospital and to residents in the southeast quadrant of town would be most beneficial. These would extend along Dakota and Lakota Avenues, Dakota Street, and Indian Health Road. A shared use path is recommended along SD 407 from Pine Ridge south to the entrance to the OST Department of Public Safety (OSTDPS) due to a pedestrian fatality along SD 407.

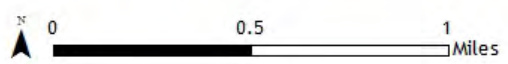




FIGURE 3-19 - Existing and Proposed Sidewalks and Shared-Use Paths - Pine Ridge



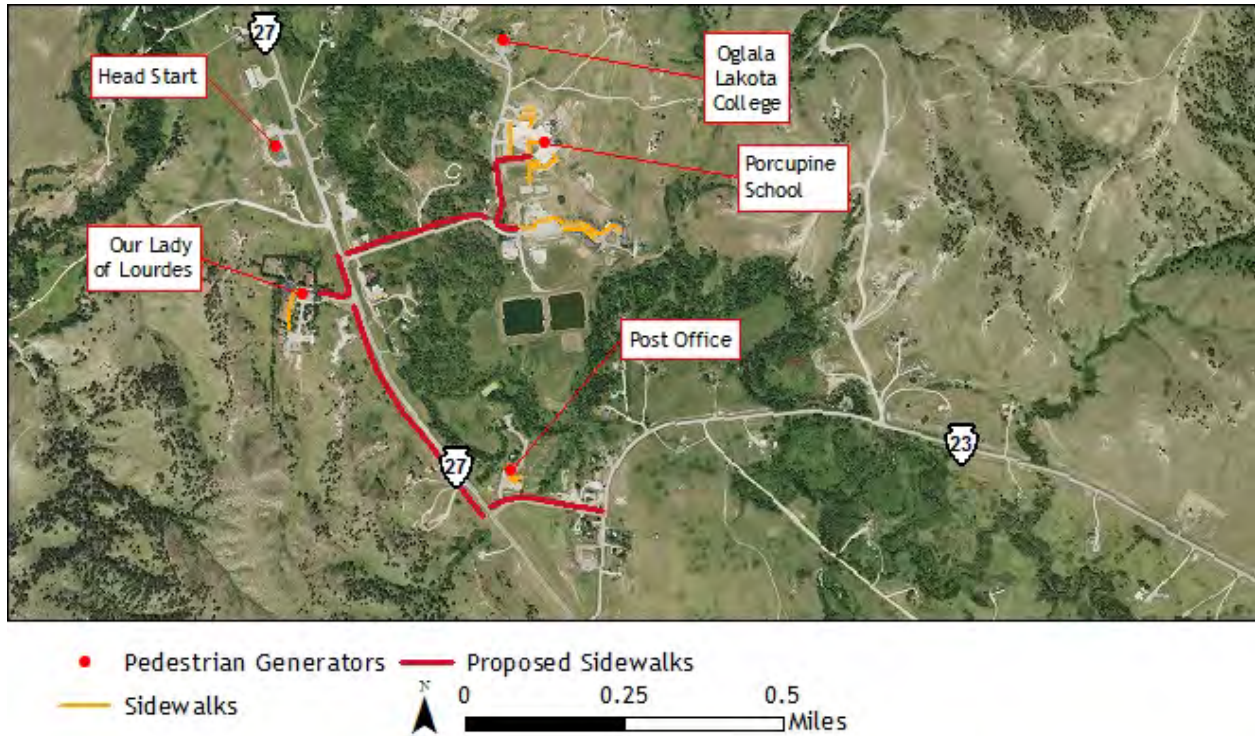
- Pedestrian Generators
- Sidewalks
- Proposed Sidewalks



Porcupine Sidewalks

There is a limited sidewalk system near the Porcupine School and in the subdivision immediately south of the school. Sidewalk improvements should be considered to connect this subdivision to the school and to connect the school to the subdivision west of the school along BIA 27. Sidewalks would also be beneficial along Main Street in Porcupine.

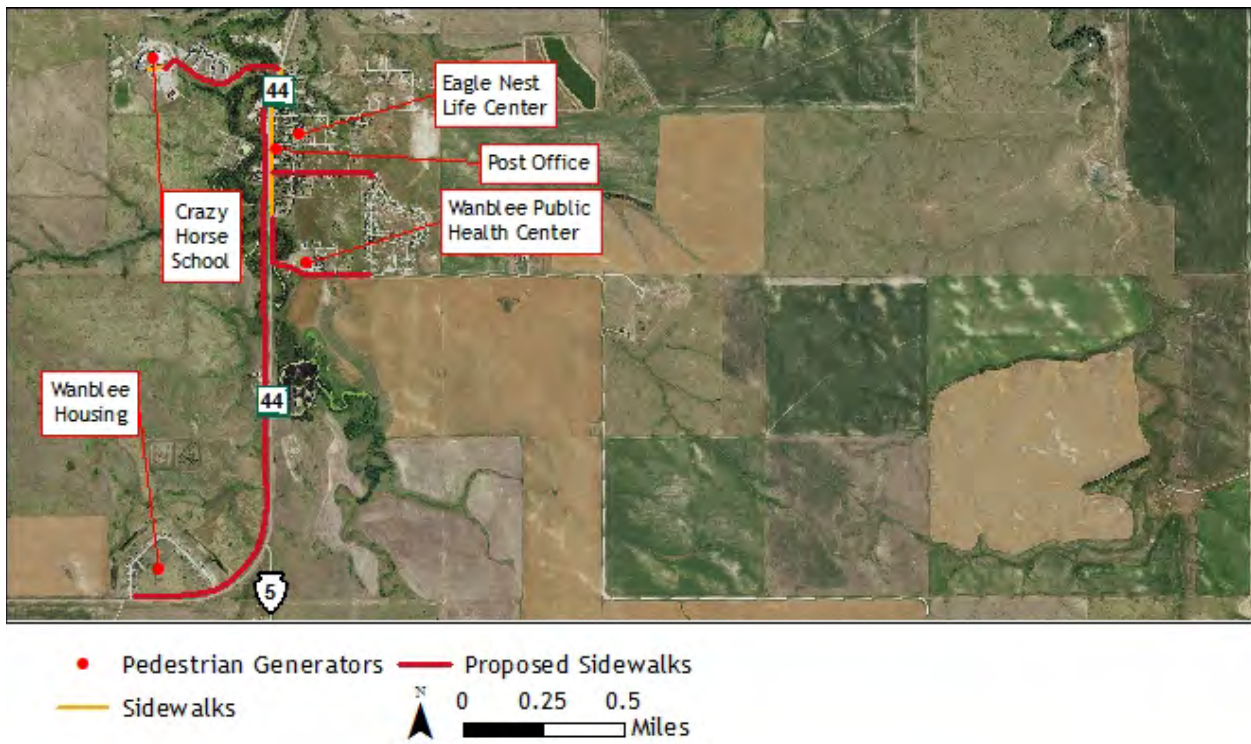
FIGURE 3-20 - Existing and Proposed Sidewalks - Porcupine



Wanblee Sidewalks

A shared use path exists along SD 44 and sidewalks exist near Crazy Horse School. Additional sidewalks should be considered along Crazy Horse School Drive to SD 44 and the SD 44 shared use path should extend along 1st Street and along 2nd Street past the Wanblee Public Health Center. A shared use path should also be constructed along the west side of SD 44 from Crazy Horse School Drive to the Wanblee housing located south of town along SD 44. These improvements will have a dramatic impact in enhancing safety and walkability for the town of Wanblee.

FIGURE 3-21 - Existing and Proposed Sidewalks and Shared-Use Paths - Wanblee





AIRPORT CONDITIONS

Pine Ridge Airport (KIEN), owned by the OST, is located two miles east of Pine Ridge. The unattended general aviation airport has one asphalt runway. Runway 12-30 is 5000 x 60 feet. The airport is used predominately for medical and governmental flights. Over the past few years, the airport has averaged over 1,000 air ambulance flight operations annually.



By road, the nearest commercial airport to Pine Ridge is Chadron Municipal Airport in Chadron, Nebraska approximately 40 miles southwest. The nearest major airport is Rapid City Regional Airport, in Rapid City, South Dakota approximately 100 miles northwest. The closest international airport is Denver International Airport in Denver, Colorado approximately 320 miles southwest.

Local input received from maintenance personnel indicated that snow plowing operations on the surrounding road system have been interrupted in the past to provide plowing at the airport. In response to this issue, the OST intends to procure an industrial tractor with snow removal attachments in 2018 to handle future plowing needs. This procurement will be funded by the \$150,000 annual entitlement grants received from the Federal Aviation Administration (FAA) Airport Improvement Program (AIP).

The FAA AIP grant program funds 90% of the eligible projects at the airport, with the State of South Dakota funding 5%. The remaining 5% is paid for with local funds. The Tribe collects a TERO fee from contractors working on airport projects to offset the local funds required for the projects.

Other short-term improvements include hangar building expansion, fueling station improvements, and general apron maintenance. Long-term improvements are planned to include addition of a second runway, Runway 18-36, pavement rehabilitation on Runway 12-30, and continued apron maintenance and expansion.

One outstanding item that the OST Tribal Council needs to act on is to legally designate the Tribal land for the existing and future airport boundary as "airport property". While the FAA requires this as a condition of the AIP grants, it will help preserve this property for future aviation development as identified on the Airport Property Map located in the Airport Layout Plan (approved by the FAA on 12/15/15).



TRANSIT CONDITIONS

On January 30, 2009, the OST held the grand opening of their public transportation system, which provides bus service with multiple vehicles to cover the entire Reservation.

Transit service provides a primary means of transportation to many Tribal members, and it enhances livability and economic progress in communities. This is particularly true on the Pine Ridge Indian Reservation, where transit services are heavily used. Transit is considered a basic public service and a means of providing access to facilities and reducing traffic congestion.



The Oglala Sioux Transit Program has seven fixed routes and covers approximately 4,000 miles per day. This includes a route to Rapid City that runs on Saturdays. Sometimes, the OST transit routes connect with Rosebud routes east of either Vetala or Wanblee. They provide service to about 1,500-1,800 passengers per month. In addition to scheduled stops, OST Transit also responds to flagged stops. The schedule for these routes is shown in Figure 3-22.

OST Transit has six transit shelters, located in Oglala, Manderson, Kyle, Wounded Knee, Martin, and Red Shirt. Only the transit shelter in Martin has asphalt surfacing that ties into the sidewalk system. The others do not. According to Emma Featherman-Sam, the Transit Program Director, many of the transit shelters are damaged or have graffiti that should be removed.

The Transit Program Director, has indicated that there is a desire to expand transit services within the Pine Ridge Indian Reservation. A new route from Kyle to Martin would be beneficial if icy hill issues can be resolved. BIA 4 between Kyle and Allen has also had winter maintenance issues that limit use by transit buses. Bus drivers try to stay off gravel roads due to bus maintenance concerns. There have also been requests received for a future route that stops in Gordon, Nebraska.

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.





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





FIGURE 3-22 -OST Transit Service Schedule

Bus Schedules

Pine Ridge to Prairie Wind		
Departs	Time	Arrives
Pine Ridge	5:15 AM	Ogjala
Ogjala	5:40 AM	Prairie Wind
Prairie Wind	6:50 AM	Ogjala
Ogjala	7:15 AM	Pine Ridge
Pine Ridge	8:00 AM	Ogjala
Ogjala	8:25 AM	Prairie Wind
Prairie Wind	9:00 AM	Ogjala
Ogjala	9:25 AM	Pine Ridge
Pine Ridge	10:30 AM	Ogjala
Ogjala	10:50 AM	Prairie Wind
Prairie Wind	11:15 AM	Ogjala
Ogjala	11:40 AM	Pine Ridge
Pine Ridge	12:30 PM	Ogjala
Ogjala	12:55 PM	Prairie Wind
Prairie Wind	1:30 PM	Ogjala
Ogjala	1:50 PM	Pine Ridge
Pine Ridge	2:30 PM	Ogjala
Ogjala	2:55 PM	Prairie Wind
Prairie Wind	3:35 PM	Ogjala
Ogjala	3:55 PM	Pine Ridge
Pine Ridge	5:00 PM	Ogjala
Ogjala	5:25 PM	Prairie Wind
Prairie Wind	6:55 PM	Ogjala
Ogjala	7:25 PM	Pine Ridge
Wednesday, Thursday and Friday's ONLY		
Pine Ridge	9:10 AM	
Prairie Wind	10:15 AM	
Ogjala	10:20 AM	
Pine Ridge	10:40 AM	
Wounded Knee	10:55 AM	
Porcupine	11:10 AM	
Sharp's	11:25 AM	
Kyle	11:45 AM	
Wanblee	12:45 AM	Pine Ridge
		2:15 AM

Wanblee to Sharp's Relay		
Departs	Time	Arrives
Pine Ridge	5:00 AM	Kyle
Kyle	6:20 AM	Sharp's
Sharp's	6:50 AM	Kyle
Kyle	7:10 AM	Potato Creek
Potato Creek	7:35 AM	Wanblee
Wanblee	8:05 AM	Potato Creek
Potato Creek	8:35 AM	Kyle
Kyle	8:55 AM	Sharp's
Sharp's	9:30 AM	Evergreen
Evergreen	9:45 AM	Porcupine
Porcupine	9:50 AM	WK
WK	10:05 AM	Pine Ridge
Pine Ridge	11:30 AM	WK
WK	11:45 AM	Porcupine
Porcupine	11:55 AM	Sharp's
Sharp's	12:10 AM	Kyle
Potato Creek	1:00 PM	Wanblee
Wanblee	1:30 PM	Potato Creek
Potato Creek	1:55 PM	Kyle
Kyle	2:30 PM	Sharp's
Sharp's	2:55 PM	Evergreen
Evergreen	3:10 PM	Porcupine
Porcupine	3:25 PM	WK
WK	3:40 PM	Pine Ridge
Wednesday, Thursday and Friday ONLY		
There will be a bus back to Wanblee		

Pine Ridge to Sharp's		
Departs	Time	Arrives
Pine Ridge	5:45 AM	Wounded Knee
Wounded Knee	6:05 AM	Porcupine
Porcupine	6:20 AM	Evergreen
Evergreen	6:27 AM	Sharp's
Sharp's	6:40 AM	Evergreen
Evergreen	6:47 AM	Porcupine
Porcupine	6:55 AM	Wounded Knee
Wounded Knee	7:10 AM	Pine Ridge
Pine Ridge	5:00 PM	Wounded Knee
Wounded Knee	5:18 PM	Porcupine
Porcupine	5:30 PM	Evergreen
Evergreen	5:40 PM	Sharp's
Sharp's	5:55 PM	Kyle
Kyle	6:20 PM	Potato Creek
Potato Creek	6:45 PM	Wanblee
Wanblee	7:15 PM	Wanblee
Wanblee	7:15 PM	Pine Ridge
Pine Ridge	7:15 PM	Pine Ridge
Wednesday, Thursday and Friday ONLY		
There will be a bus back to Wanblee		

Pine Ridge to Martin		
Departs	Time	Arrives
Pine Ridge	5:15 AM	
Batesland	5:45 AM	Martin
Martin	6:15 AM	Allen
Allen	6:45 AM	
Batesland	7:15 AM	Pine Ridge
Pine Ridge	11:00 AM	
Batesland	11:30 AM	Allen
Allen	12:00 AM	Martin
Martin	12:30 AM	
Batesland	12:50 AM	
Pine Ridge	1:20 PM	
Pine Ridge	5:00 PM	
Batesland	5:35 PM	Martin
Martin	6:05 PM	Allen
Allen	6:35 PM	
Batesland	7:00 PM	Pine Ridge
Pine Ridge	7:00 PM	Pine Ridge
Wednesday, Thursday and Friday ONLY		

Red Shirt/Drywood to Pine Ridge		
Leaves	Time	Arrives
Transit Station	5:30 AM	Drywood
Drywood	6:18 AM	Red Shirt
Red Shirt	6:50 AM	Drywood
Drywood	7:20 AM	Pine Ridge
Transit	5:00 PM	Drywood
Drywood	5:37 PM	Red Shirt
Red Shirt	6:10 PM	Drywood
Drywood	6:40 PM	Transit

Manderson to Pine Ridge		
Departs	Time	Arrives
Pine Ridge	5:45 AM	No Manderson
No Manderson	6:35 AM	Manderson
Manderson	6:55 AM	Wounded Knee
Wounded Knee	7:15 AM	Manderson
Manderson	7:45 AM	Wounded Knee
Wounded Knee	8:05 AM	Manderson
Manderson	8:35 AM	Wounded Knee
Wounded Knee	8:55 AM	Manderson
Manderson	9:20 AM	Wounded Knee
Wounded Knee	9:40 AM	Pine Ridge
Pine Ridge	11:15 AM	Manderson
Manderson	11:50 AM	Wounded Knee
Wounded Knee	12:10 PM	Pine Ridge
Pine Ridge	4:00 PM	Manderson
Manderson	4:40 PM	Wounded Knee
Wounded Knee	5:20 PM	Manderson
Manderson	5:40 PM	Wounded Knee
Wounded Knee	6:00 PM	Pine Ridge
Wednesday, Thursday and Friday ONLY		
There will be a 10:30 bus back to WK/Manderson		

Slim Buttes to Pine Ridge		
Leaves	Time	Arrives
Transit Station	7:00 AM	Slim Buttes
Slim Buttes	7:35 AM	Pine Ridge
Transit Station	2:00 PM	Slim Buttes
Slim Buttes	2:35 PM	Pine Ridge
Transit Station	3:00 PM	Slim Buttes
Slim Buttes	3:35 PM	Pine Ridge
Available Bus Driver		





FIGURE 3-23 -OST Transit Service Routes

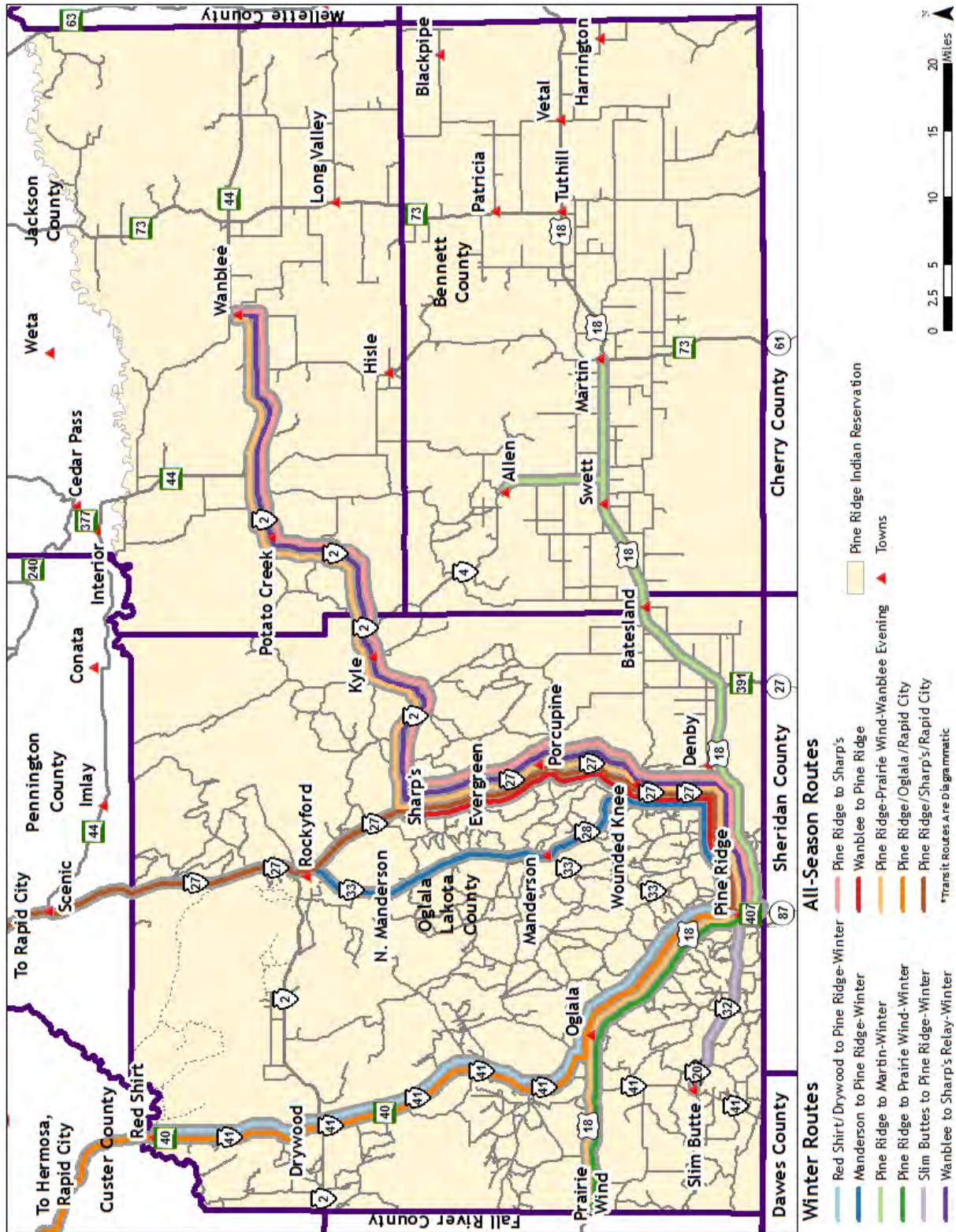




FIGURE 3-24 - Pine Ridge Transit Service Schedule

PINE RIDGE VILLAGE TOWN LOOP



1st RUN		2nd RUN		3rd RUN		4th RUN		5th RUN		6th RUN		7th RUN		8th RUN		9th RUN	
Transit Station	7:00 AM	Transit Station	8:00 AM	Transit Station	9:00 AM	Transit Station	10:00 AM	Transit Station	11:00 AM	Transit Station	12:00 PM	Transit Station	1:00 PM	Transit Station	2:00 PM	Transit Station	3:00 PM
East Ridge	7:05 AM	Hospital	8:05 AM	Hospital	9:05 AM	Hospital	10:05 AM	Hospital	11:05 AM	Hospital	12:05 PM	Hospital	1:05 PM	Hospital	2:05 PM	Hospital	3:05 PM
North Ridge	7:09 AM	Elderly Complex	8:09 AM	Elderly Complex	9:09 AM	Elderly Complex	10:09 AM	Elderly Complex	11:09 AM	Elderly Complex	12:09 PM	Elderly Complex	1:09 PM	Elderly Complex	2:09 PM	Elderly Complex	3:09 PM
Cohen Home	7:12 AM	Commodities	8:09 AM	Commodities	9:12 AM	Commodities	10:12 AM	Commodities	11:12 AM	Commodities	12:12 PM	Commodities	1:12 PM	Commodities	2:12 PM	Commodities	3:12 PM
Court Yards	7:15 AM	Yellow Birds	8:12 AM	Yellow Birds	9:15 AM	Yellow Birds	10:15 AM	Yellow Birds	11:15 AM	Yellow Birds	12:15 PM	Yellow Birds	1:15 PM	Yellow Birds	2:15 PM	Yellow Birds	3:15 PM
PRHS/OLC	7:19 AM	Crazy Horse	8:15 AM	Crazy Horse	9:19 AM	Crazy Horse	10:19 AM	Crazy Horse	11:19 AM	Crazy Horse	12:19 PM	Crazy Horse	1:19 PM	Crazy Horse	2:19 PM	Crazy Horse	3:19 PM
Tribal Office	7:20 AM	Justice Center	8:15 AM	Justice Center	9:20 AM	Justice Center	10:20 AM	Justice Center	11:20 AM	Justice Center	12:20 PM	Justice Center	1:20 PM	Justice Center	2:20 PM	Justice Center	3:20 PM
Cherry Hill	7:25 AM	Sioux Nation	8:16 AM	Sioux Nation	9:25 AM	Sioux Nation	10:25 AM	Sioux Nation	11:25 AM	Sioux Nation	12:25 PM	Sioux Nation	1:25 PM	Sioux Nation	2:25 PM	Sioux Nation	3:25 PM
Justice Center	7:29 AM	Crazy Horse	8:16 AM	Crazy Horse	9:29 AM	Crazy Horse	10:29 AM	Crazy Horse	11:29 AM	Crazy Horse	12:29 PM	Crazy Horse	1:29 PM	Crazy Horse	2:29 PM	Crazy Horse	3:29 PM
Sioux Nation	7:34 AM	Yellow Birds	8:16 AM	Yellow Birds	9:34 AM	Yellow Birds	10:34 AM	Yellow Birds	11:34 AM	Yellow Birds	12:34 PM	Yellow Birds	1:34 PM	Yellow Birds	2:34 PM	Yellow Birds	3:34 PM
Crazy Horse	7:38 AM	Dialysis	8:16 AM	Dialysis	9:38 AM	Dialysis	10:38 AM	Dialysis	11:38 AM	Dialysis	12:38 PM	Dialysis	1:38 PM	Dialysis	2:38 PM	Dialysis	3:38 PM
Yellow Birds	7:42 AM	Hospital	8:16 AM	Hospital	9:42 AM	Hospital	10:42 AM	Hospital	11:42 AM	Hospital	12:42 PM	Hospital	1:42 PM	Hospital	2:42 PM	Hospital	3:42 PM
Elderly Complex	7:46 AM	Dept. Soc. Serv	8:16 AM	Dept. Soc. Serv	9:46 AM	Dept. Soc. Serv	10:46 AM	Dept. Soc. Serv	11:46 AM	Dept. Soc. Serv	12:46 PM	Dept. Soc. Serv	1:46 PM	Dept. Soc. Serv	2:46 PM	Dept. Soc. Serv	3:46 PM
Hospital	7:50 AM	Transit	8:16 AM	Transit	9:50 AM	Transit	10:50 AM	Transit	11:50 AM	Transit	12:50 PM	Transit	1:50 PM	Transit	2:50 PM	Transit	3:50 PM
Dept. Soc. Serv	7:53 AM		8:16 AM		9:53 AM		10:53 AM		11:53 AM		12:53 PM		1:53 PM		2:53 PM		3:53 PM
Transit Station	7:58 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
East Ridge	8:00 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
North Ridge	8:05 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Cohen Home	8:09 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Court Yards	8:12 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
PRHS/OLC	8:13 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Tribal Office	8:15 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Cherry Hill	8:16 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Justice Center	8:22 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Sioux Nation	8:28 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
PRHS/OLC	8:31 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Cohen Home	8:35 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
North Ridge	8:42 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
East Ridge	8:45 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Transit Station	8:48 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
East Ridge	9:00 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
North Ridge	9:05 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Cohen Home	9:09 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Court Yards	9:12 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
PRHS/OLC	9:15 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Tribal Office	9:16 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Cherry Hill	9:20 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Justice Center	9:25 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Sioux Nation	9:29 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
PRHS/OLC	9:38 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Cohen Home	9:42 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Yellow Birds	9:46 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Elderly Complex	9:50 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Hospital	9:53 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Dept. Soc. Serv	9:58 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM
Transit Station	9:58 AM		8:16 AM		9:58 AM		10:58 AM		11:58 AM		12:58 PM		1:58 PM		2:58 PM		3:58 PM

BUS FARES

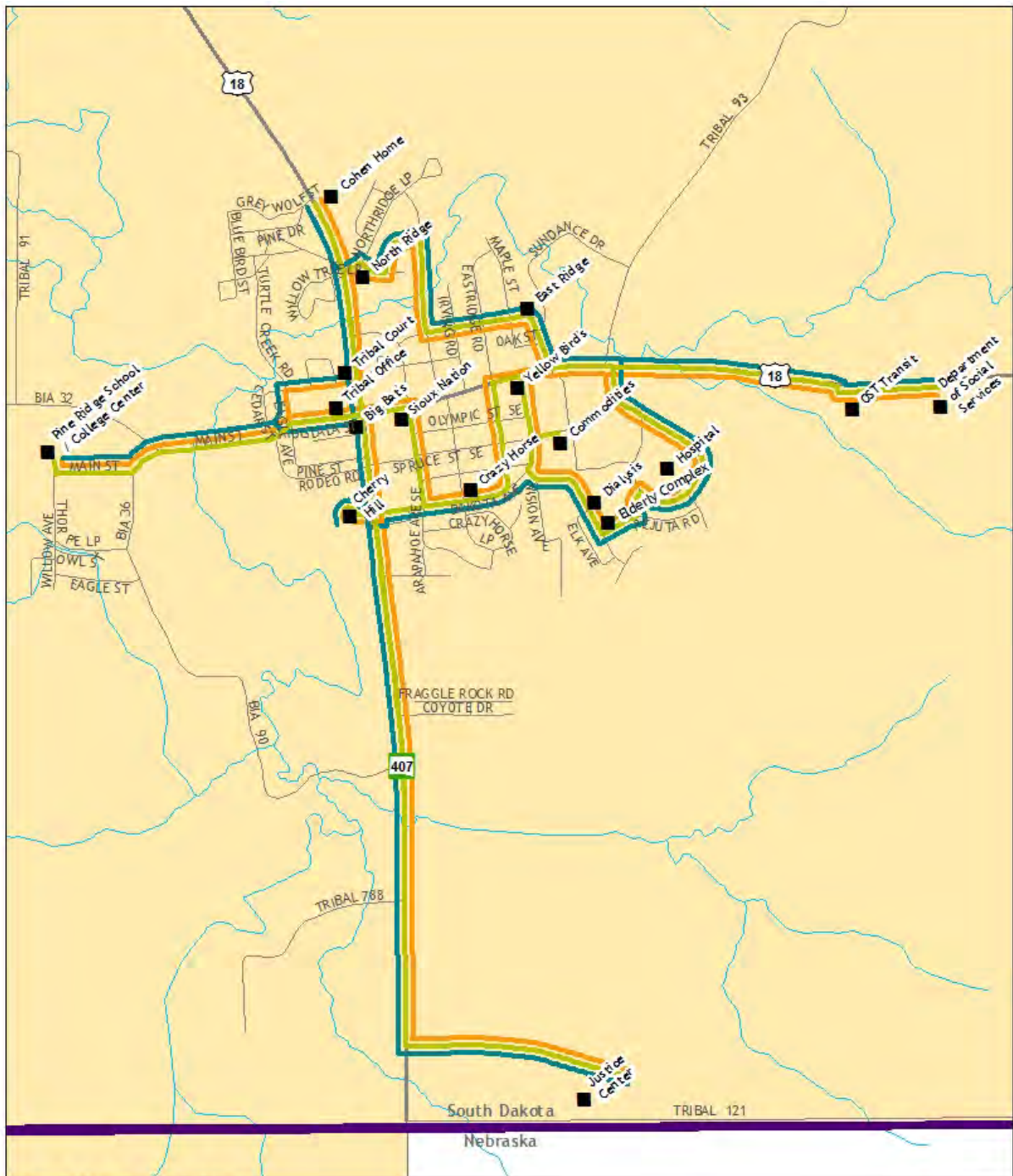
Adults - \$1.00
Seniors 60+ Free

PLEASE CONTACT THE MAIN OFFICE TO SCHEDULE FOR RIDES

OST TRANSIT
PO BOX 468
PINE RIDGE SD57770
PHONE: 605-867-2337
FAX: 605-867-2314



FIGURE 3-25 - Pine Ridge Transit Service Routes



Pine Ridge Transit Runs

- Runs 1,3,5,7,9
- Runs 2,4,6,8
- Run 10
- Transit Stops



UTILITY CONDITIONS

Utility conditions have an important part to play 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.

During the planning for this document, 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. Like planning for 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. It is recommended that such future utilities planning, and mapping be completed.

THUNDER VALLEY DEVELOPMENT CONDITIONS

The Thunder Valley development, located along BIA Highway 27 less than ½ mile north of Sharp's Corner, is progressing and will provide commercial and residential growth in the near future (See Figures 3-26 and 3-27). Developers are projecting 502 residents in single family homes, apartments, townhomes, and a youth center. Planned phases include a commercial strip with a grocery store, offices, and retail space. Gravel roads are planned, though, with the density and type of traffic in this development, eventual paving would be beneficial.

FIGURE 3-26 - Thunder Valley Masterplan



This development has the potential to generate a fair amount of traffic and pedestrian activity between the development and Sharps Corner. Construction of turn lanes along BIA Highway 27 for the development, and sidewalks and a shared use path inside the development and connecting the development with the Sharps Corner Store and adjacent residential development is recommended. These costs should be borne by the development.

Provision of a transit shelter inside the development is also recommended. Transit funds to cover this cost could be applied for in the future.





FIGURE 3-27 - Thunder Valley Aerial Site Plan





TRAFFIC CONDITIONS AND TRIP GENERATION

Many factors influence the traffic safety and mobility of a transportation system. These include the levels of existing and projected traffic, roadway capacity and intersection control, roadway geometrics, traffic operations, access management and on-street parking among others.

EXISTING AND PROJECTED TRAFFIC

Existing Average Daily Traffic (ADT) count data for years 2011, 2015, and 2016 was collected from the SDDOT website. Tribal ADT data has been collected over 7 years from 2006 to 2012. The busiest BIA roads (over 1000 vehicles per day) and their heaviest measured ADT's are listed in Figure 3-28.

FIGURE 3-28 - Highest OST Traffic Locations

<u>Route</u>	<u>Location</u>	<u>Vehicles/Day</u>
BIA 2	W of Kyle	2186
BIA 27	N of Porcupine	2133
BIA 4	SE of Kyle	1719
BIA 35	SW of Oglala	1580
BIA 41	NW of Oglala	1543
BIA 89	At Loneman School, Oglala	1434
BIA 32	W of Pine Ridge	1383
BIA 28	N of Wounded Knee	1266
BIA 115	E of Oglala	1095

Available ADT data by year is shown in Figures 3-29 and 3-30. Since many of the Tribal ADT's date back as far as 2006, it would be beneficial for the OST to schedule new traffic counts wherever new data might be beneficial. In particular, new count data for potential grant application routes would support development of successful applications.

A review of recent population growth suggests that traffic volumes on non-state corridors within the Reservation will stay relatively constant over time. Appreciable increases in traffic will occur due to growth of through traffic on the state highway system or isolated growth associated with new developments. Traffic increases may also occur as roads are improved, resulting in fewer people avoiding travel on poor roads, or increased tourism due to improved roads, signing, and amenities.

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 highway system. Some of the highest trip generators within the Reservation include gas stations, stores and eating establishments, and schools. A review of pedestrian generating land uses was completed as part of the LRTP. These land uses were mapped in Chapter 3, along with existing sidewalks and desired linkages.





The SDDOT has used growth factors based on 2012 data by county and functional classification to estimate projected traffic. 30-year growth factors for all rural roads in Jackson County, and Bennett County would coincide with a 25-year growth factor from 2017. A growth factor of 1.15 was applied to existing traffic data for a year 2043 projection.

Projected traffic volumes are shown in Figures 3-31 and 3-32. A review of future volumes indicates that the current two-lane facilities will provide adequate capacity over the next 20 years and beyond. The increased traffic volumes may lead to the need for some additional turn lanes and changes in traffic control. These needs should be evaluated on a case by case basis.





FIGURE 3-29 - Existing Average Daily Traffic

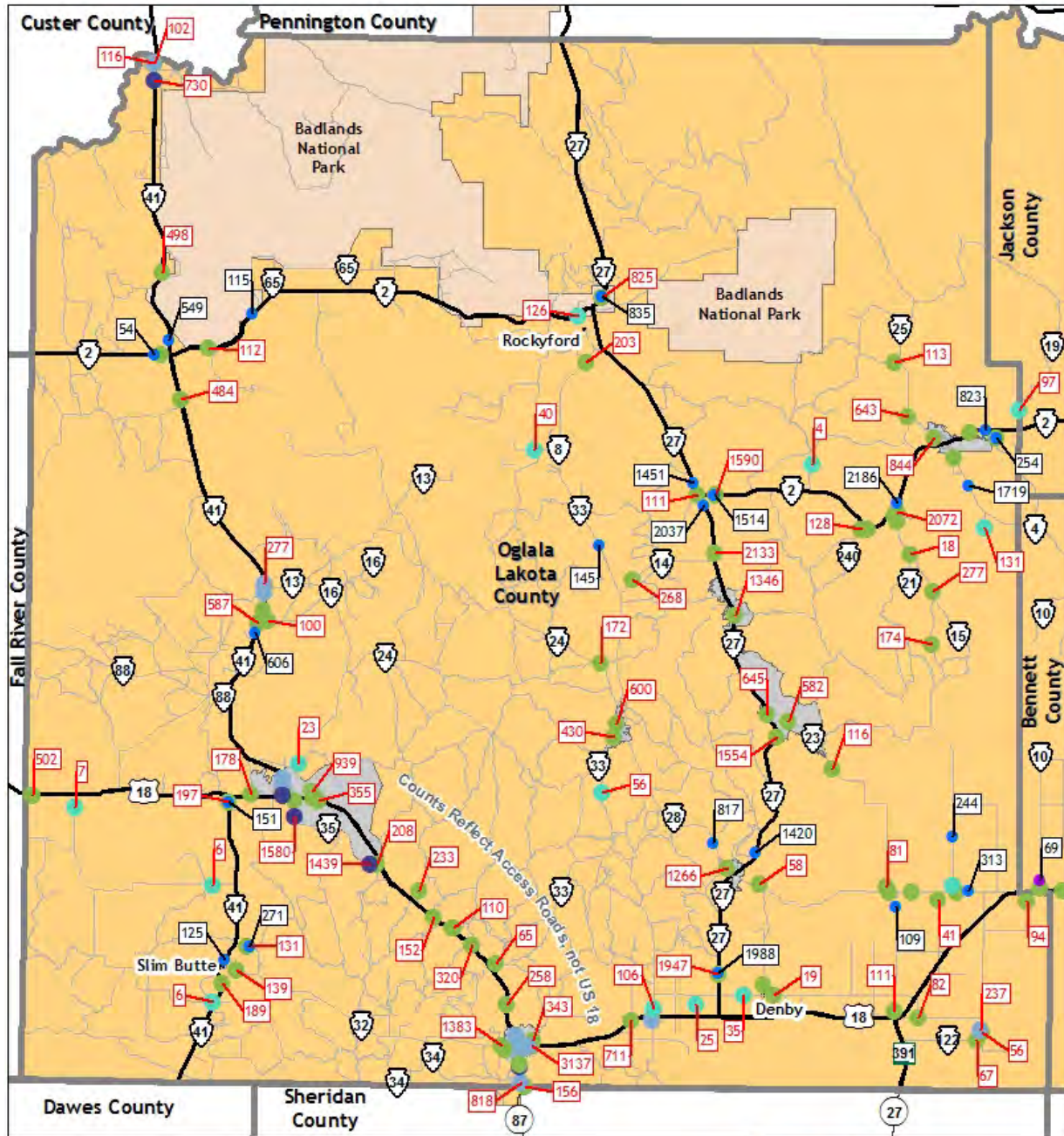




FIGURE 3-30 - Existing Average Daily Traffic

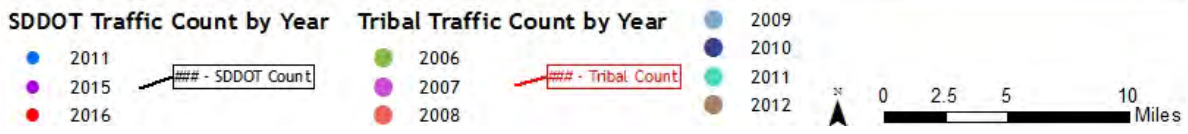
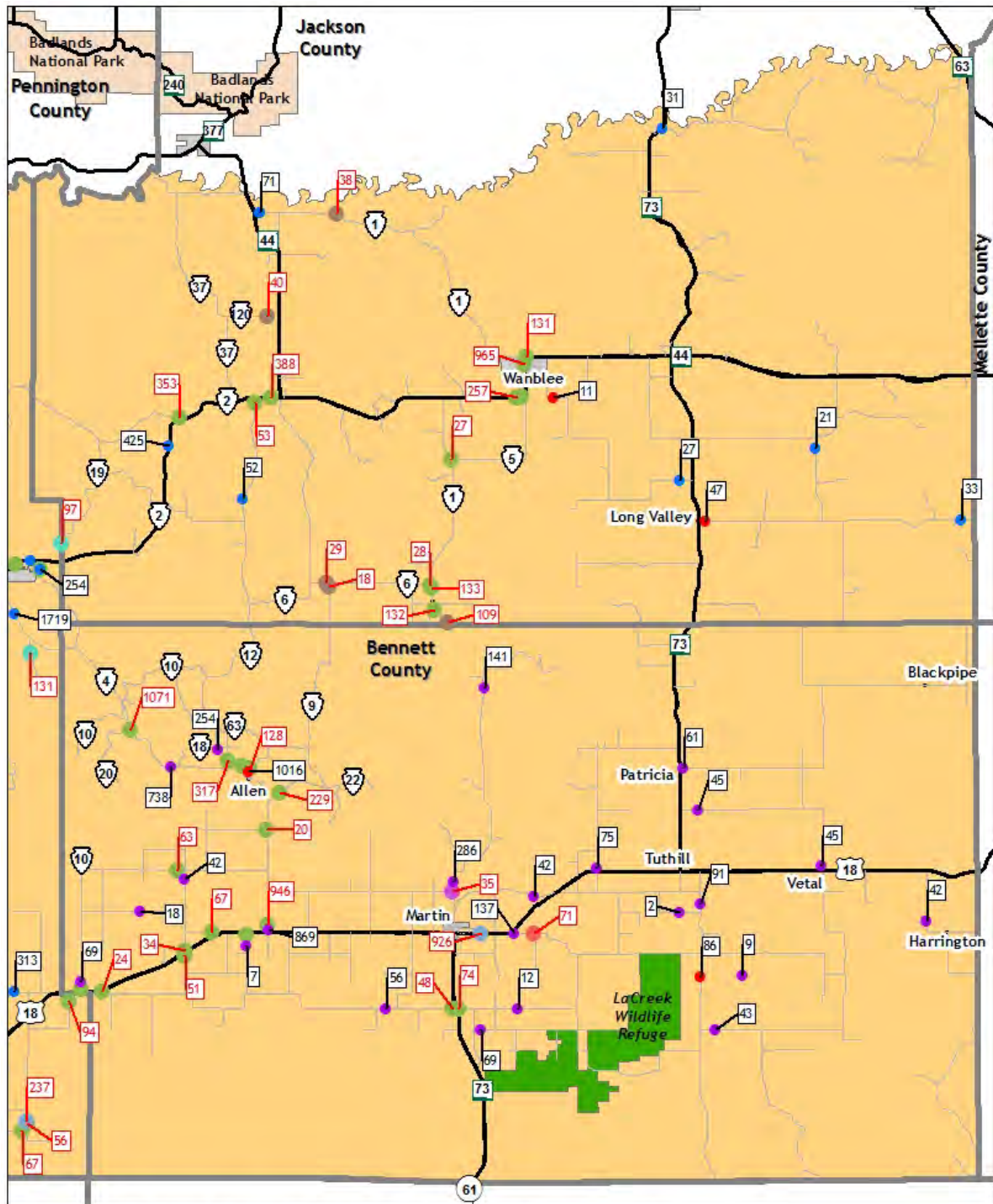
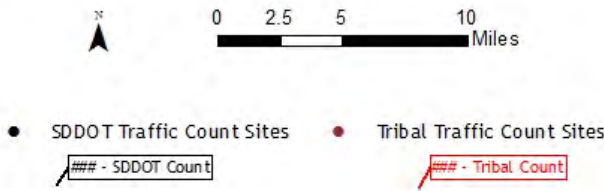
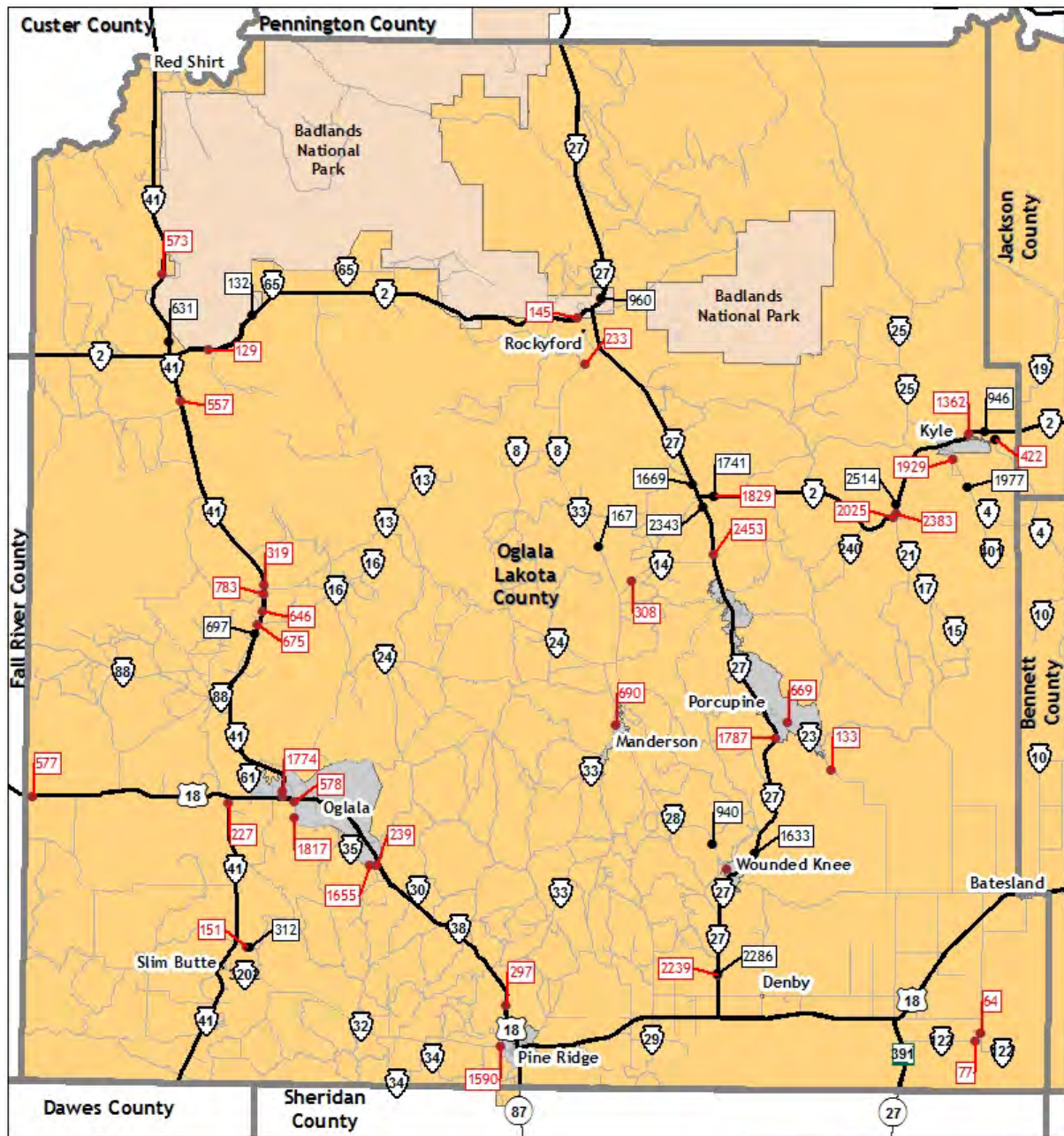




FIGURE 3-31 - Year 2043 Projected Average Daily Traffic



Inset not at same scale as main map

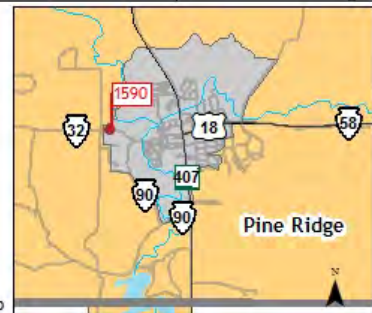
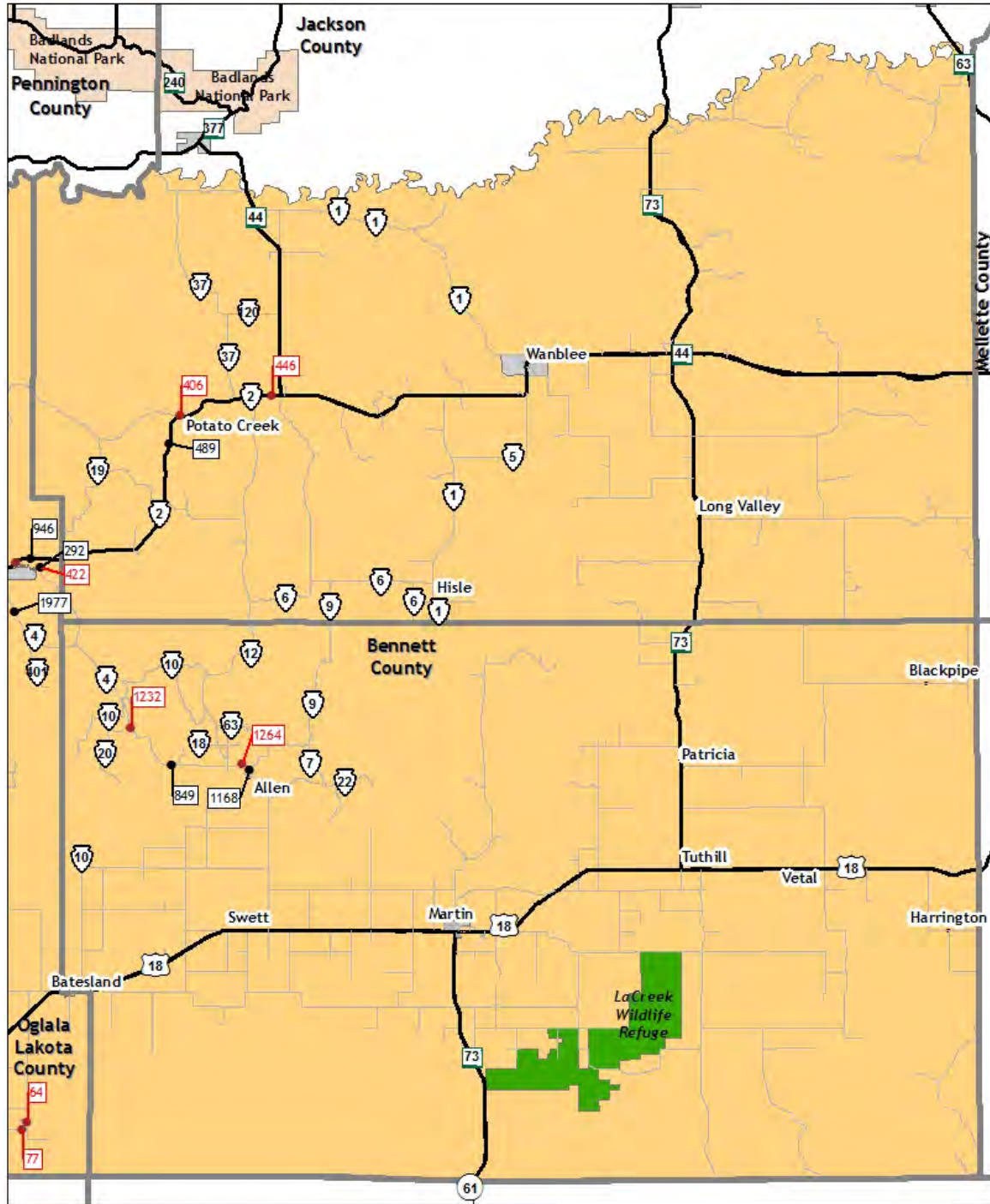




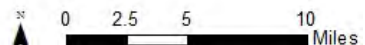
FIGURE 3-32 - Year 2043 Projected Average Daily Traffic



- SDDOT Traffic Count Sites
- Tribal Traffic Count Sites

- SDDOT Count

- Tribal Count



ROADWAY CAPACITY AND TRAFFIC OPERATIONS

It was beyond the scope of this report to provide an in-depth analysis of intersection capacity at any location within the Reservation. However, 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.

While no capacity issues were identified from a review of daily traffic volumes, traffic congestion has been reported during peak hours on some days near the Sharps Corner Store. This issue could be remedied by development of a traffic circulation and parking plan for the site. A possible conceptual traffic circulation plan for the site is shown in Figure 3-34. This plan could integrate site improvements near the store with turn lane improvements at the intersection of BIA 2 and BIA 27. Further turn lane and other improvements relative to Thunder Valley and Sharps Corner housing developments could be addressed at the same time.

The SDDOT has programmed construction of roundabouts at the hospital road/US Highway 18 intersection and at the US Highway 18/East Ridge Housing Road intersection in Pine Ridge for 2022 (See Figure 3-33). These improvements would serve to upgrade both traffic operations and traffic safety at key intersections in Pine Ridge. The OST Business, Economic, and Development Committee unanimously endorsed the concept of implementing roundabouts on the Pine Ridge Indian Reservation at their June 16, 2017 meeting.

FIGURE 3-33 - Pine Ridge Roundabouts Planned by SDDOT

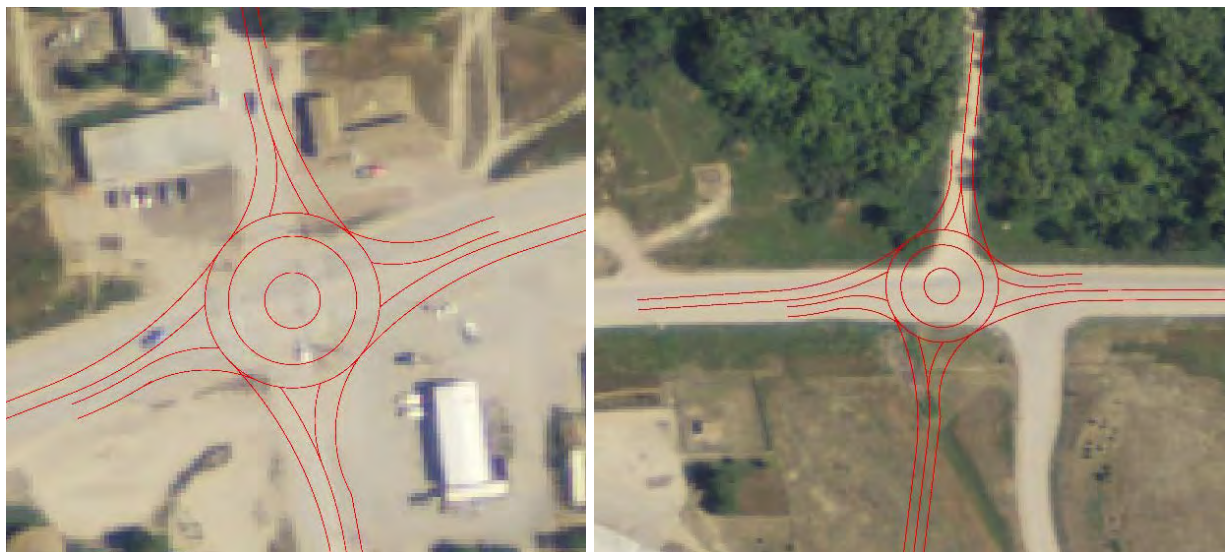





FIGURE 3-34 - Sharps Corner Store Conceptual Circulation Plan



Sharps Corner Grocery Store Parking Layout  0 50 100 Feet





CRASH AND SAFETY ANALYSIS

The 2016 Tribal Transportation Safety Plan (TTSP) provided an in-depth analysis of crash data and trends. The Safety Plan provides strategies and recommendations to improve education, enforcement/EMS, engineering, and safety planning/other provisions to address safety needs within the Reservation. Proposed engineering recommendations and strategies from that Plan included:

- Install school zone signing with flashing beacons
- Participate in safety projects for signing, striping, and rumble strips
- Conduct Road Safety Audits (RSA) on BIA, Tribal and County Roads
- Develop shared use Paths and pathway lighting projects in Kyle along BIA 2, Manderson along BIA 28, and along BIA 407 from the Justice Center/Corrections to Pine Ridge
- Provide remote weather monitoring stations
- Develop a social media page for safety reporting

Per the TTSP, there are transportation safety issues that are causing crashes, increasing crash severity, or restricting complete data analysis. Those supported by data included:

- Wild and domestic animal crashes
- Crashes with fixed objects
- Overturning crashes
- Alcohol impaired driving
- Lack of seat belt use
- Young drivers
- Pedestrian fatalities
- Intersection crashes

The TTSP identified many other transportation safety issues based upon personal experience that are causing crashes, increasing crash severity, or are otherwise creating transportation safety concerns in the local communities. These include:

- Snow and ice removal
- Distracted driving
- Need for intersection improvements (sight distance, lighting, advanced warnings)
- Speeding
- Overweight trucks
- Transportation of hazardous materials
- ATV use
- Lack of penalties by the court system





Crash locations that occurred from 2012 to 2016 on the OST Reservation were mapped by year in Figure 3-36. Most of the crashes occurred on the US and State Highway Systems. This is not unexpected, as traffic volumes are highest along those roadways. Off those systems, it is valuable to see locations on the BIA road system where crashes are most frequent. Example corridors include BIA 2, BIA 4, BIA 32, and BIA 3. These corridors also possess other cross-sectional features that impact safety conditions. An examination of these features is provided in Figure 3-35.

FIGURE 3-35 - Pine Ridge Indian Reservation Safety Concern Corridors

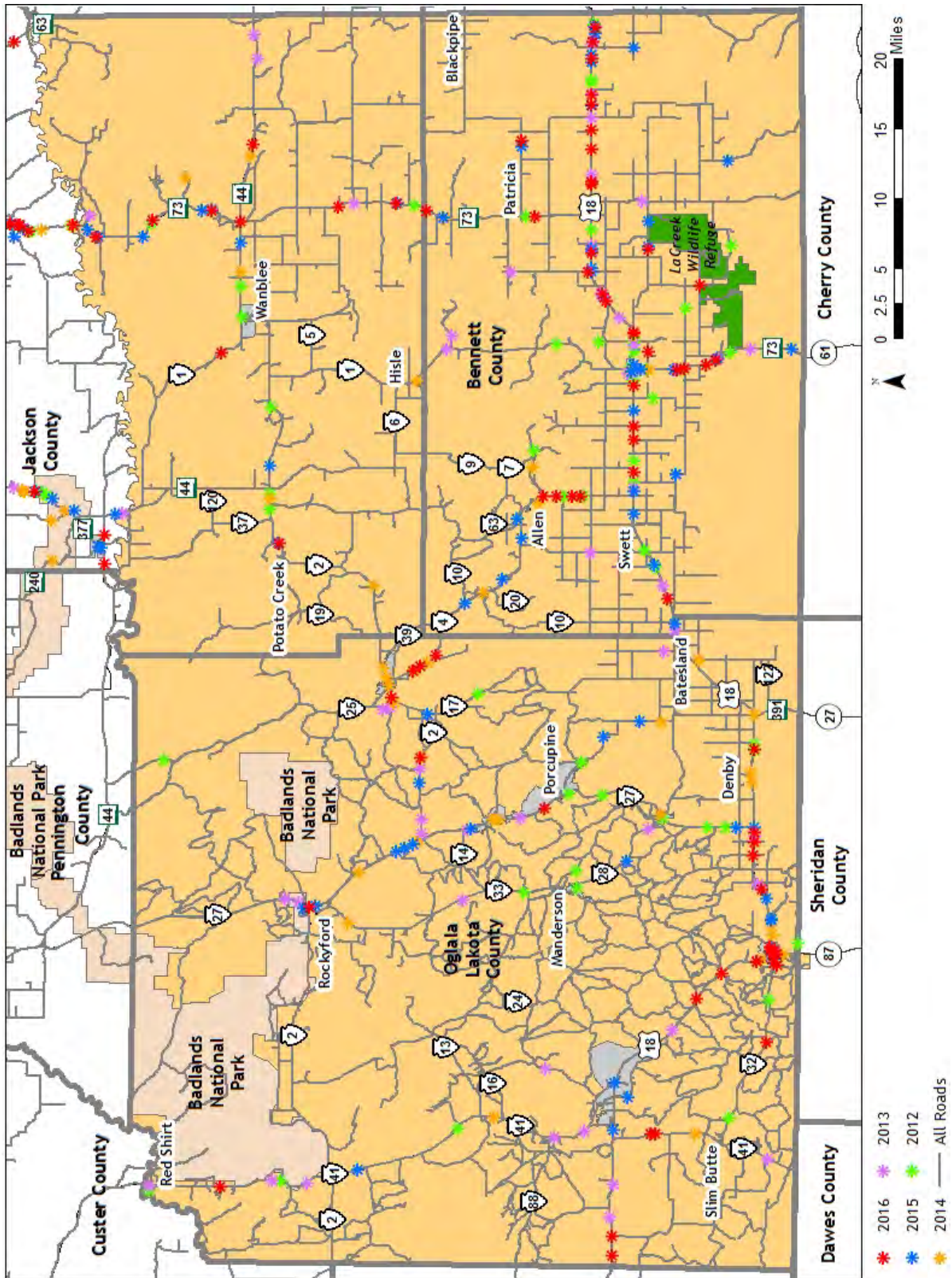
BIA Route	Location	Shoulder Widening	Realign Curves	Clear Zone	Flatten Inslopes	Gravel or Overlay	Reconstruction	Notes
2	Kyle to SD 44	x	x	x	x		x	No shoulders, steep inslopes, sharp curves, trees
32	Pine Ridge to BIA 41	x		x	x		x	Failed culverts, settled pavements, narrow
33	Manderson to US Highway 18		x		x	x	x	Deficient section, limited drainage, poor surface
4	BIA 63 to Kyle	x	x		x		x	No shoulders, steep inslopes, sharp curves

Projects along corridors that have high crash rates or more severe crashes should provide necessary mitigation of safety issues.





FIGURE 3-36 - Pine Ridge Indian Reservation Crashes

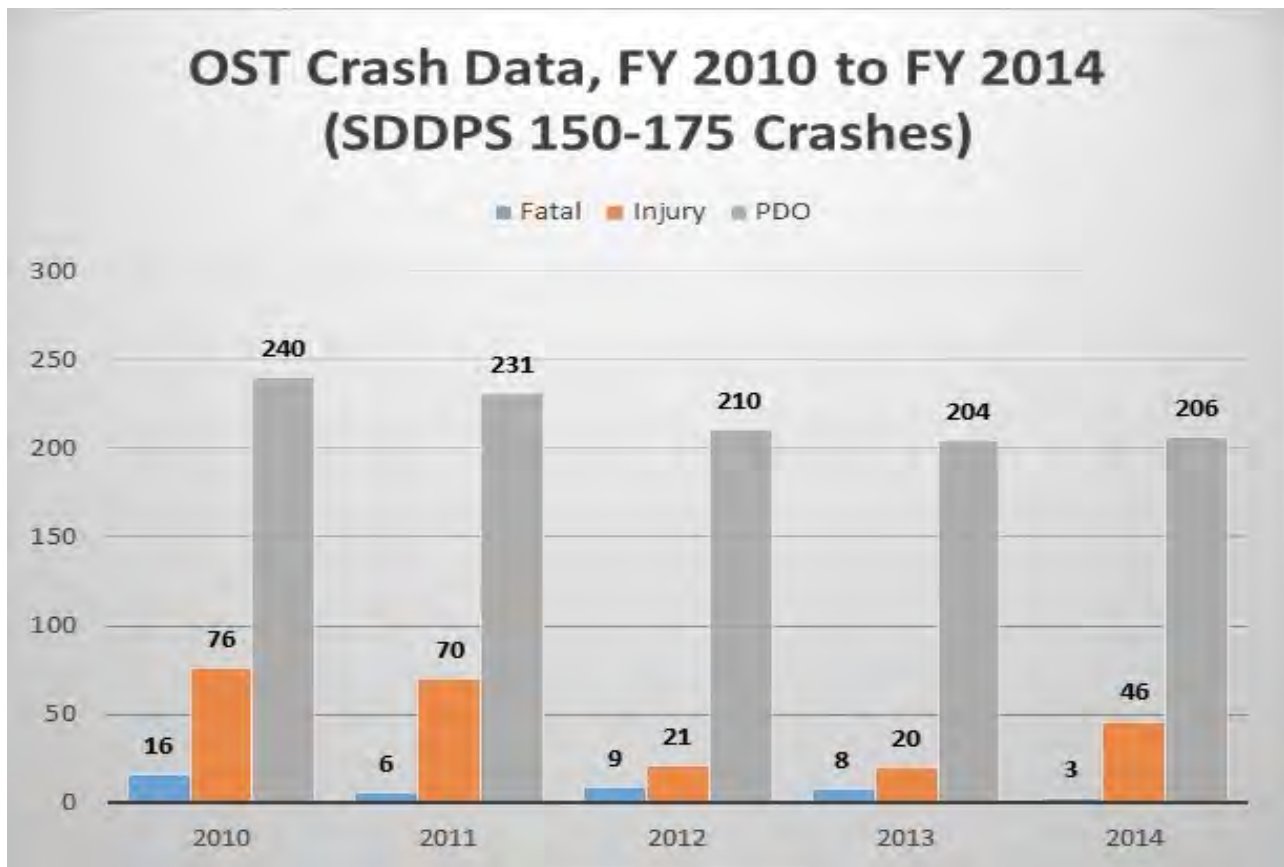




The OSTDPS has been using the Traffic and Criminal Software (TraCS) system for crash data and criminal records. This allows for the collection and analysis of data to determine crash causes at the Tribal level. The OSTDPS provided data from 2010 through 2014 for inclusion in the development of the TTSP. This data showed that during that period there were over 1350 total crashes, which is an average of 275 per year. The data from the SDDPS was only showing approximately 160 crashes per year.

While the OSTDPS are collecting electronic crash data, this information is not currently making it into the SDDPS databases. As with the SDDPS information, the total crashes are showing a slight downward trend. This can be seen in Figure 3-37. It is unclear how many of the 233 injury crashes or 42 fatalities are included in the data provided by the state, but the high number of injuries and fatalities recorded by both agencies exemplifies the need for better data sharing to ensure the true extent and nature of the traffic crash issues are identified.

FIGURE 3-37 - Pine Ridge Indian Reservation Crashes



The OST Crash data, was consistent with other sources in crash causes. The clear majority of fatal crashes are caused by a single vehicle running off the road and overturning. This data showed that over

60% of the fatalities were this type of crash (See Figure 3-38). One area that did show up in the OST data was that 7% of the





fatalities were pedestrians. This data could be used to support the need for improved or separated pedestrian facilities.

The number of pedestrian and bicycle crashes, though few, tend to result in severe or fatal crashes when they occur.

Figure 3-38 - OST Crash Fatalities by Cause



TRAFFIC CONTROL EVALUATION

Traffic control analysis is based upon standards outlined in the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD) published by the Federal Highway Administration. The MUTCD includes standards for all-way stop control, traffic control signals and pedestrian hybrid beacons. The MUTCD does not have warrants for two-way stop control, roundabouts, or pedestrian beacons.

Selecting the appropriate traffic control device is based on the unique site conditions that pertain to traffic patterns, volumes, roadway geometrics and lane configurations. As traffic increases and patterns change, the appropriate traffic control device for a location may vary.

Substantial research has been conducted to determine the conditions under which various types of traffic control operate most effectively. This research has been accounted for in the guidance found in the MUTCD. Implementation of a traffic control device under conditions where another device would be better suited can lead to increased delays and a reduction in safety. Therefore, it is recommended that traffic devices only be installed following engineering study and in accordance with the MUTCD.

It was beyond the scope of this plan to conduct a review of intersection or roadway corridor traffic control devices across the Reservation. This effort may be completed in the future as part of a separate study if prioritized by the Tribe. If undertaken, it should include a system-wide inventory of traffic control signs and their conditions, so that signing decisions can be consistently applied. Maintaining an inventory of signs with installation dates will help plan for signage replacement projects. A brief explanation of common traffic control devices and their applications is provided in the following paragraphs.





The SDDOT may be conducting a road signing and conditions study by County soon. The OST should support and participate in the program, as it is a tremendous opportunity to conduct a review of the signs and perform upgrades. Road Safety Audits may also be conducted to evaluate signing and delineation along specific corridors or within geographic regions.

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 special 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 type of traffic control require consideration of vehicular traffic volumes, pedestrian crossing volumes and crosswalk lengths. The pedestrian volume threshold required for this type of control is a minimum of 20 pedestrians in the peak hour. Rectangular Rapid Flashing Beacons (RRFB) is a type of PHB found to exhibit a high rate of motorist compliance due to their visual characteristics.

Pedestrian Flashing Beacons

Flashing beacons may be used at pedestrian crosswalks to enhance pedestrian visibility and induce vehicle stoppages. The MUTCD does have warrants for these types of traffic control. However, due to the construction, maintenance, and operating costs; installation of these types of control should be judiciously selected based upon a traffic study. While this LRTP was under development, some of the existing pedestrian flashing beacons on the Pine Ridge Indian Reservation had fallen into disrepair. This further heightens the need for caution when selecting this form of traffic control device. Additionally, installation of traffic control devices at unjustified locations results in reduced motorist compliance.

If selected for installation, it is recommended that installation of flashing beacons be coupled with pavement markings and signage to increase motorist compliance. Additionally, it is recommended that these beacons be fully pedestrian actuated. Studies have found that





motorists become desensitized to pedestrian beacons that flash throughout the entire day. A commitment for ongoing maintenance should be established prior to installation of additional flashing beacons.

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. Two-way stop control should also be considered at intersections where at least one of the legs is functionally classified as a collector or greater.

The TWSC should be installed on the lower classified roadway, or the roadway with lower traffic volumes to promote unrestricted progression along the major roadways. In locations where stopping may not be needed and where there are no sight obstructions, use of yield signs instead of stop signs should be considered.

Roundabouts

There are currently no roundabouts in the study area, though, two have been proposed in Pine Ridge by the SDDOT. One is proposed at the hospital road/US Highway 18 intersection and the other is proposed at the US Highway 18/East Ridge Housing Road intersection. 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:

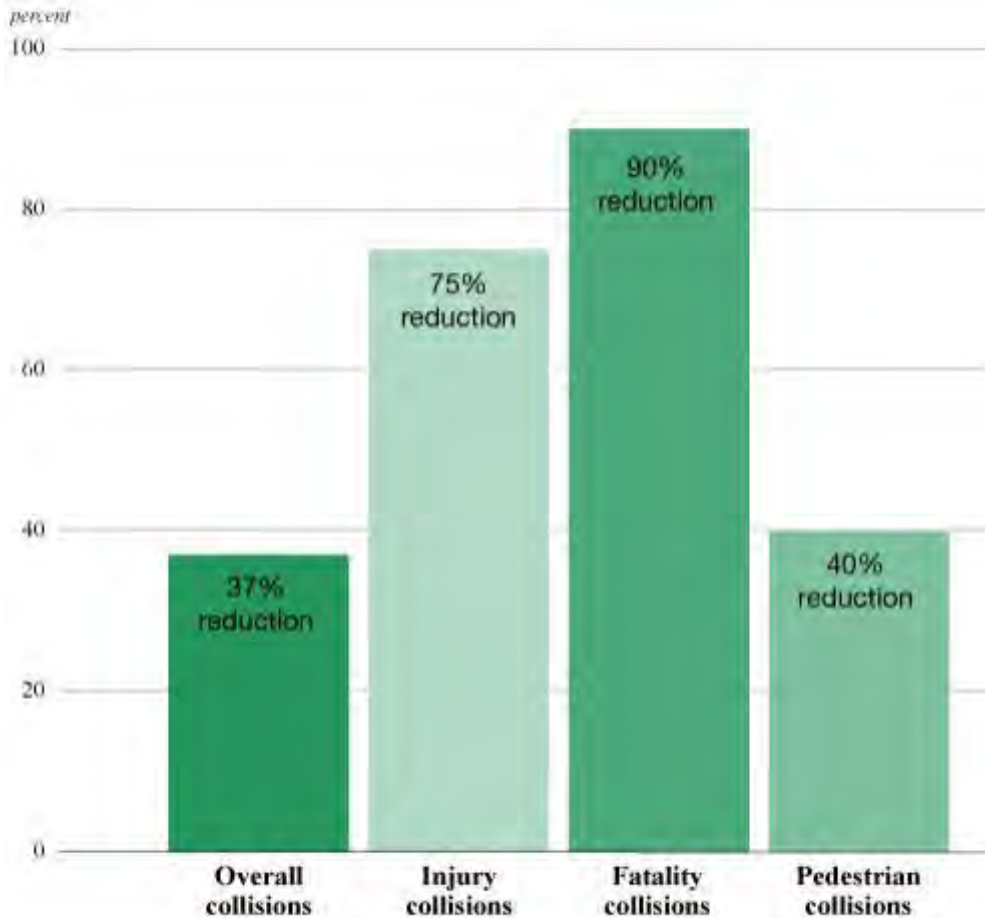
- Roundabouts have fewer vehicular conflict points in comparison to conventional intersections. The potential for high-severity conflicts, such as right angle and left-turn head-on crashes, is greatly reduced with roundabout use.
- Low speeds generally associated with roundabouts allow drivers more time 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 need only cross 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 3-39.





Figure 3-39 - Roundabout Reduction in Collisions



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

ACCESS CONDITIONS

High levels of access exist along various highway segments within the Pine Ridge Indian Reservation. Studies have shown that this increases the potential for crashes. Efforts should be taken to reduce access when possible. The best time to consider such actions is when a road project is planned. New development plans should also be carefully reviewed to determine whether planned access will interfere with safety or mobility along an adjacent highway.

Skewed access points can also increase the potential for crashes. Figure 3-40 shows a proposed road realignment for BIA Route 26 in Kyle. This project is being completed using US Department of Health and Human Services grant funding received by Oglala Lakota College. This is an example of how skewed or poor access configurations can be corrected.

New accesses on both sides of a roadway should be located directly across from each other. When this is not possible, engineering judgement should be applied to minimize conflicts between left turning vehicles. Additionally, new accesses should be placed where there is clear





sight distance and adequate separation from other accesses. Road reconstruction projects should move accesses to match new access guidelines where feasible.

Figure 3-40 - BIA Route 26 Realignment



ON-STREET PARKING

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

A high volume of on-street parking maneuvers can impede traffic progression as parking vehicles block through traffic. 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. Wherever on-street parking is underutilized, consideration should be given to phasing it out over time.

EXISTING MAINTENANCE STRATEGY AND FUNDING

On November 16, 2017 a meeting was held with OSTDOT and RMD staff. The purpose of this meeting was to discuss current road maintenance practices, challenges, and potential strategies to improve maintenance operations.



The OSTDOT and RMD are responsible for a myriad of activities, including but not limited to snow plowing, graveling, blading, addressing washouts and erosion, mowing, pot hole repairs, asphalt patching, crack routing and sealing, dust control, and maintenance of equipment, guardrail, culverts, and signing. The OST has a RMD that includes 8 full-time and 2 part-time employees.

Other OST departments support maintenance activities as they are able. Given that the RMD is responsible for maintaining about 1,300 miles of gravel roads and over 250 miles of paved roads within the Reservation, to say they are understaffed is an understatement.





With such a large road network to cover, the RMD operates in an emergency management mode much of the time. They are continually responding to critical needs as they occur. Examples of these needs include impassible roads on school bus routes, fixing large potholes, replacing stop signs that have been knocked over, replacing failed culverts, emergency snow removal, and many others.

It's common for OST maintenance crews to be pulled from the project they are on to help with an emergency project somewhere else. This is a role they are very good at, yet it does increase inefficiency in their work flow, as it takes time to provide the added coordination, stopping the work that's already underway, travel, starting up in another area, finishing, and then going back to the work that was originally scheduled. Responding to emergencies makes it difficult for maintenance crews to follow through with projects that have been established as priorities.

Potential methods to increase maintenance efficiencies have been discussed and will continue to be explored. Improved equipment and training can increase the proficiency of work crews to perform patching, crack routing and sealing, culvert repair, graveling and blading, thus enhancing efficiency over time.

Other potential methods to improve efficiency include having a roaming work crew or addressing the more typical problem locations from a systematic standpoint before they occur. For example, repair of 100 culverts or all culverts in a given geographical area as a project, instead of repairing individual culverts on a case by case basis. Significant benefits and improvements in maintenance efficiency and effectiveness will also be realized if new sources of gravel are permitted at various geographic locations throughout the Reservation.

The RMD needs employees who see working for the OST as a good, long term job opportunity. Only then will they stay long enough to receive the experience and training needed to operate heavy equipment both efficiently and effectively, and to develop the skills to handle the many responsibilities the maintenance team is asked to address. This is essential as these abilities are confined now to a few key staff. The constant interruptions to projects is stressful to RMD personnel and with the current under-staffed department, the RMD cannot afford to lose employees or supervisors.

If someone gets sick, goes on vacation, or quits, staffing has limited redundancy and the impacts are magnified. A staffing plan that addresses possible advancement and succession for key staff would provide needed long-term assurance that knowledge and capabilities within the OSTDOT and RMD are maintained.

The limited availability of workers who can be trained to operate heavy equipment and who are willing to work long hours further complicates keeping experienced people on staff. To attract the best employees, wages, overtime pay, and benefits competitive with local contractors would need to be offered.





The lack of sufficient funding further limits the RMD's ability to meet common expectations for road maintenance. About 1/3 of their funding goes to snow removal. Funding limitations impact all aspects of maintenance. These include the ability to hire and keep experienced personnel, the ability to pay for overtime, reduced ability to stockpile aggregate and other essential construction materials, and reduced ability to have equipment in good operating condition. The biggest equipment needs currently include the need for more blades and backhoes.

The SDDOT is responsible for the maintenance of South Dakota and United States highways within the Reservation. The SDDOT has programmed a mill and overlay project for 2018 along SD 44 from Interior to the BIA 2 intersection. They have also programmed a grading project along US Highway 18 for 2025 from the Gordon Junction to west of Swett to tie in to where PCC Pavement begins.

In 2018, the SDDOT has offered an agreement to the OST 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. In 2019, the OST plans to co-bid with SDDOT to perform a chip seal project on many of the OST's paved roads. This will further enhance the ability of maintenance crews to concentrate on other needs.





CHAPTER 4 - PUBLIC INVOLVEMENT

Public involvement is the cornerstone of community transportation planning activities. Support for the plan enables Tribal officials to implement the plan knowing their decisions address the primary concerns that have been raised.

The public involvement process was initiated by meeting with the Economic, Business and Development (E, B & D) Committee on June 16, 2017. After a short presentation to the Committee, several issues were raised concerning transportation needs around the Reservation. A sign in sheet and summary of the meeting is provided in Appendix A.

Public input meetings were held at the OSTDOT in Pine Ridge, OST Rural Water Facility in Kyle, and at the Thunder Valley Complex north of Sharps Corner on July 11, 12, and 13, 2017 respectively. The public meetings were held to solicit public input and to engage and inform the public. Input that was received is covered in this chapter. A sign in sheet and meeting summary from each meeting is included in Appendix A. The input was critical in identifying transportation needs on the Reservation which provided direction for the analyses and recommendations. Public input also assisted in identifying key issues, improvement opportunities and the overarching values of the OST.

The following meetings were held as part of this Plan:

1. Three public input meetings were held early in the planning process to identify issues and project needs: OSTDOT in Pine Ridge, OST Rural Water Facility in Kyle, and at the Thunder Valley Complex north of Sharps Corner on July 11, 12, and 13 respectively.
2. A BIA midpoint review memo was sent to FHWA on December 28, 2017. No comments were received.
3. Three public input meetings are being scheduled to receive feedback on the draft LRTP Report: OSTDOT in Pine Ridge, OST Rural Water Facility in Kyle, and at the Thunder Valley Complex north of Sharps Corner. The feedback that is received will be incorporated into the final report once received.
4. A public Tribal Council meeting will be scheduled later in 2018 in Pine Ridge to review and approve the plan. Once any further input has been received and incorporated into the plan, the resolution of approval will be provided in Appendix A.

Information at the meetings included PowerPoint visual displays, exhibits and illustrative drawings. Meeting announcements were posted in the Lakota Country Times and the Rapid City Journal for the public meetings to encourage attendance and notify interested parties of the input opportunities. For the second set of public input meetings, copies of the draft Report were made available for viewing at **(locations to be determined)**.





PUBLIC INPUT RECEIVED – ISSUES AND NEEDS

The following areas of concern and opportunities for improvements were identified during the E, B & D meeting, and the three public meetings held in 2017 as part of the public involvement process:

INPUT FROM THE E, B & D MEETING

- What percentage of the cost for improvements would be applied to paved roads?
- Will the plan address housing? Steve responded that he intended to meet with Tribal housing representatives to better understand where growth was proposed.
- On Craven Road (BIA 1?), the solid waste site is muddy and nearly inaccessible.
- Along the scenic by-route to Buffalo Gap, Red Shirt Road should be paved.
- Kyle Transportation Needs
 - American Horse Creek Road - Bus Route
 - Build up higher with gravel and repack. Roads become wider, gravel pushes off.
 - Potato Creek - needs a reroute of access, too steep and winding.
 - BIA 4 South to Allen - the roadway could use a reseal, paving is separating and over time it is slightly getting worse.
 - Intersection in front of school where 3-way exists becomes congested during school days and special events. Needs traffic signal?
 - Reflective edge markings needed along some corridors.
 - North Route (BIA 25) needs to be paved
 - BIA 17 from 5-mile to Batesland needs to be paved
 - Kyle housing roads need to be repaved
 - Road around Little Wound School needs repair.
 - Medicine Root road needs repair
- Oglala District Transportation Needs
 - Red Shirt Table Road - BIA 41 (North & South)
 - Oglala Housing Road BIA 115
 - Grass Creek Road BIA 16
 - Chadron Jct. Road BIA 41 South





- Wakpamni District
 - BIA 29 south off Hwy 18 E.
 - Wolf Creek Housing Road
 - 2-mile stretch - Wash board road
 - Housing Area - non-paved road
 - School Route
- Wanblee
 - Wanblee School housing road is in bad condition and needs repairs
 - BIA 1 south to Martin - school bus driver complaints have been received
 - There are many pedestrians in Long Pine Subdivision - need path and lighting
 - Are improvements to Highway 44 planned? The road is in bad shape. Street lighting, sidewalks and bike paths are also needed.
 - There is a safety issue on Highway 27. Coming off the hill, there is a sharp bend at the bridge - Dave, can you help identify the specific location
 - Hisle Road, Craven Road/BIA 1 need sidewalks

INPUT FROM OSTDOT IN PINE RIDGE PUBLIC MEETING 1A

- New gravel source has been approved and is awaiting permitting. It is located on the west side of BIA 41 north of BIA 2. Another is located on the north side of Potatoe Creek.
- It would be beneficial for the Tribal Housing Authority to meet with OSTDOT at least annually.
- All trucking and freight within the Pine Ridge Indian Reservation is pass-thru and stays on the state highway system, except when trucks choose to avoid weigh scales.
- The Airport is used primarily for medical reasons and transports no freight
- Need better infrastructure connections to promote business development
- Need a better and more direct route from Oglala to Manderson (BIA 24)
- Improve the following roads
 - Grass Creek Road
 - BIA 33
 - American Horse Creek





- Wounded Knee to Batesland needs to be paved
- Manderson to Red Cloud
- Gooseneck road was recently paved
- Show how much infrastructure improvements will cost
- Manderson housing roads are in bad shape
- Need bike/pedestrian facilities in Porcupine
- Application for Kyle Trail TA funds has been submitted to SDDOT
- Erosion and sediment along White Horse Creek Road is a safety problem
- Water quality and damage to vegetation along roads is a concern
- Need to show funding shortfall in the LRTP
- Ash Street from Batesland to the dump is in bad condition
- Pedestrian crosswalks and beacons are desired along BIA 2 in Kyle
- Wanblee needs a transit shelter and has bad housing streets

INPUT FROM KYLE RURAL WATER PUBLIC MEETING 1B

- Gravel road maintenance was discussed. It was described as being constantly in crisis mode. OST operates an annual road maintenance program for gravel and asphalt roads, and bridges using a budget of \$521,000. Subtracting about \$200,000 for personnel overhead, this leaves about \$321,000 for maintenance activities. This program is normally supplemented with about \$150,000 per year from the construction program. Maintenance is TTP eligible if under \$500,000 or less than 25% of the TTP, whichever is greater.
- Pavement improvement needs along BIA 41 and BIA 33 were discussed. OSTDOT is considering ways to prolong the life of these pavements until sufficient funding is available to reconstruct them.
- Old Allen Road south of Kyle needs to be built up and graveled. It leads to St. Barnabus Cemetery, and families with children live along it. School busses have trouble serving these families due to poor road conditions.
- Optional funding resources was discussed. These included raising the motor fuels tax and a wheel tax for vendors. Dave said the wheel tax item was given to the attorneys for the OST for them to write the law and nothing has come of it. Dave also said the OST needs laws for overweight vehicles and haul road agreements. Proper execution





- of haul road agreements could get businesses to help pay for road maintenance. Use of scales was the only way to charge overweight trucks.
- The hill to housing in North Potato Creek is too steep. It cannot be maintained and is a safety concern as vehicles could slide into BIA 2 traffic.
- The LRTP should investigate whether OST Housing is willing to provide money for road improvements.
- Since the court system doesn't appear to be able to help imposing fines, it is questionable whether load restrictions can help the OST.
- The Transportation Code needs to be updated. Advancements in technology should be addressed.
- Water and sewer hookups has been a problem since roads are often damaged when trenches for utilities are cut.

Establishment of a Transportation Technical Committee comprised of transportation, environmental, health and housing staff would be beneficial. This group should meet on regular intervals to discuss issues and opportunities.

INPUT FROM THUNDER VALLEY PUBLIC MEETING 1C

- The US Highway 18 project damaged waterlines.
- Thunder Valley representatives attended the meeting and reviewed site plans for future construction.
- A slower speed limit should be considered along BIA 27
- Thunder Valley should have a transit shelter, right and left turn lanes
- Need a transit shelter pad and sidewalks at Thunder Valley out to BIA 27 for connection to Sharps Corner Store and Sharps Housing
- Repave BIA 2 west of SD 44 to help tourism to get Scenic Byway designation.
- BIA 27 is in bad condition north of Sharps Corner
- Wind towers are being planned NW of Potato Creek through Hisle (somewhat along BIA 25 north of Kyle). The company, JW Oceti Sakowin plans construction about 18 months after miter towers go up. This could lead to them funding significant transportation improvements to improve roads and bridges for hauling wind tower components.





- The planning office wants mapping centralized. Mapping for the LRTP should be made available to them.
- Thunder Valley roads need to be paved
- Thunder Valley is planning for a possible sports complex on the east side of BIA 27. A culvert could be installed along BIA 27 to serve as a pedestrian underpass.
- A four-way stop should be considered at Sharps Corner.
- Major vehicle queues have been observed at the Sharps Corner Store on the 1st and 10th days of each month. A study may be needed to consider solutions.

INPUT FROM COUNTY HIGHWAY SUPERINTENDENTS

In July 2017, informal meetings were held with the highway superintendents of Jackson County, Oglala County, and Bennett County to receive input on any questions or concerns they might have. Input that was received from them was incorporated into this plan.

INPUT FROM OGLALA SIOUX LAKOTA HOUSING (OSLH)

On November 21, 2017 a meeting was held with OSLH staff at the OSLH main office. Ernie Little and OSLH maintenance staff were in attendance. The following items were discussed:

- There is a great need for quality gravel for use in maintaining driveways
- Housing has road maintenance equipment of their own, which includes a belly dump, front end loader, road grader, and a backhoe
- Housing is not planning future paved roads for subdivisions. All future planned roads are gravel surfaced
- Future development locations have not been defined. They typically avoid agricultural or ranch lands and stay near rural water
- Pine Ridge, Kyle, and Wanblee are most likely to grow because they have a lagoon system and available Tribal lots

RESPONSE TO PUBLIC COMMENTS

Most of the input received from the public were referred to the OSTDOT for considered action. In addition, many of the project-related requests were incorporated into the long-range element of the LRTP as long-range projects.





CHAPTER 5 - PAVED ROAD AND BRIDGE RECOMMENDATIONS

This chapter focuses on the strategies and projects needed to maintain and improve upon the existing paved roads and bridges for which the OST is responsible for. Key recommendations include the following:

- Continue Pavement Management Program (PMP)
- Establish a Schedule for Pavement Preservation and Maintenance
- Identify Routes Needing Reconstruction or New Construction
- Address Overweight Trucks on Reservation Roads
- Undertake Short and Long Range Paving Projects
- Complete Bridge Improvement Projects

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. Bridge recommendations are based on the inspection results and cover proposed project improvements.

CONTINUE PAVEMENT MANAGEMENT PROGRAM

A PMP is a systematic approach to planning, programming, design, construction, maintenance, rehabilitation, and periodic evaluation of highway pavements. Pavement conditions on the highway system are typically rated based on standard criteria such as distress, ride quality, friction, and rutting. Detailed data are collected for the pavement management system and used by engineers and the OSTDOT to determine the ideal strategy to keep the pavement in good condition.

Usually the data are translated into ratings of "good" or "poor" for easier understanding by other agencies and the public. The PASER analysis discussed in Chapter 3 describes the process that was completed to visually rate the conditions along the OST's paved BIA highways.

The PMP for the OST was last updated June 2009. It included a history of pavement upgrades, field surveys of pavement surface conditions, a structural capacity survey, and a combined pavement condition rating for road segments.

The last PMP provided a top 10 rehabilitation project ranking, and a top 5 preservation projects ranking. Rehabilitation projects were those required to address existing project needs, whereas preservation projects were intended to maintain pavements that had already been improved. Needs identified in that PMP far exceeded available funding.

The PMP developed during this LRTP planning process was established to provide guidance on upcoming pavement management priorities. The factors that were used to set OST PMP priorities included the following:





- Pavement condition
- Pavement age
- Traffic volume
- Shoulder width and geometric upgrade needs
- Crash history

The goal of the PMP prepared within this LRTP is to eventually have all paved roadways on a rotation of crack sealing and chip sealing projects. This allows the maximum number of paved roadways to be maintained in good operating condition, so deterioration doesn't lead to reconstruction.

Two challenges exist in implementing this goal. First, most of the roads that are in good condition have gone 10 years or longer without a seal coat. If the OST continues to delay seal coats on these facilities, they run the risk of pavements deteriorating to the point where reconstruction is needed. Second, there are currently about 80 miles of pavements that are in the reconstruction or structural overlay categories. It will likely take many years to obtain the funding to bring all these roads into a good condition status.

With these issues in mind, highest priority should be given to scheduling crack sealing and chip sealing projects along highways whose pavements are getting older but that are still in good condition, with reconstruction projects then prioritized as funding allows. Since crack sealing and seal coats have low costs compared to construction, preserving roads in good condition will only delay major reconstruction projects a year or two.

When developing a PMP, using multiple datasets to assess existing and forecasted future pavement conditions offers the redundancy necessary to provide an accurate and objective evaluation of roadway needs. Although not completed within the scope of this study, the use of deflection testing in conjunction with historical data and PASER surveys provides an accurate and objective evaluation based upon all relevant criteria. Deflection testing was done in the previous PMP so it was not done in this one. Perhaps in the next LRTP, deflection testing should once again be considered where changed road conditions merit a more detailed analysis.

The surface distress survey alone does not always give an accurate indication of the actual pavement condition; often the surface distresses are not visible due to maintenance activities such as recent seal coats. By including the structural analysis in the pavement management process, the OST can assure that roadways with the greatest needs are being addressed first. Delay in repairs to a roadway in need can ultimately cost the OST thousands of dollars for major rehabilitation in the future.

Once pavement conditions were determined (See Chapter 3), this PMP could determine the best strategies to keep existing pavements in good condition. The PMP draws on pavement condition data and combines major corrective actions (reconstruction), moderate corrective actions (rehabilitation), and minor fixes and preventative measures (pavement preservation) and general maintenance activities to address highway system needs. In this approach, each





category of projects has a critical role in improving the future condition of the highway network.

Combining all four programs into a single comprehensive strategy achieves the most manageable highway network. Pavement preservation and maintenance provide the most influential components of the pavement management strategy, allowing the Tribe to maintain desired pavement conditions on most paved facilities without the high costs of reconstruction or rehabilitation. The expensive rehabilitation and reconstruction projects are then completed over time as funding allows.

MAINTENANCE

General maintenance on the paved roadway system primarily consists of pavement marking, crack sealing, and pothole patching. Maintenance often includes ancillary needs within the right-of-way, including mowing, repair or replacement of culverts and signs. Funding is set aside for equipment repairs and acquisition.

PAVEMENT PRESERVATION

Pavement preservation refers to activities associated with pavement maintenance, including chip seals, crack filling and sealing, and overlays. A pavement preservation program has been initiated for key BIA routes on the Pine Ridge Indian Reservation roadway system. The pavement preservation program is intended to meet public expectations for safe, smooth, and well-maintained roads by applying cost-effective treatments to correct minor pavement deficiencies before the problems become major. Pavement preservation departs from traditional strategies that had focused on reactive maintenance and reconstruction.

It is critical that pavement preservation, when feasible, receive priority over roadway reconstruction. Maintaining and rehabilitating infrastructure at appropriate times saves public dollars in the long-term. These improvements will help prolong the life of the roadways and decrease chances of premature failure.

Preventive maintenance applies lower-cost treatments to retard a highway's deterioration, maintain or improve the functional condition, and extend the pavement's service life. With various short-term treatments, preventive maintenance can extend pavement life an average of 5 to 10 years. Applied to the right road at the right time, when the pavements are mostly in good condition, preventive maintenance can improve the network condition significantly at a lower unit cost.

Some roads within the Reservation towns and subdivisions are paved. This is good if money is available to maintain them. A PASER analysis of the conditions of these roads would be beneficial. Those that are in adequate condition should be included in the crack filling and sealing, and chip seal programs. Locations that are not in good condition should be addressed through patching and eventual major rehabilitation or reconstruction as funding allows.





Description of Pavement Preservation Strategies

Timing on treatments is particularly important to maintain an effective pavement management budget. Crack sealing is best performed when temperatures are moderately cool, such as the spring or fall months. Cooler temperatures are generally when the cracks are fully open, allowing for the entire crack to be sealed. More in-depth maintenance (minor overlays, chip seals, etc.) can be done in the summer months; generally, between May 1st and August 31st so that minimum temperature guidelines can be followed for quality purposes.

Crack sealing can also be performed with less labor involved, so a smaller crew can handle these in the fall and spring, whereas the more intensive maintenance plans can be done in the summer when contractors and maintenance departments typically have seasonal manpower as well. Higher temperatures also lessen the cure time required, thus allowing the roadway to be opened in a shorter period. Full reconstruction and structural overlays are generally more labor and equipment intensive and are much more expensive.

Sealing needs to be performed in moderation. Extensive sealing operations can result in a loss of pavement friction, which would then lead to a chip seal for the roadway to function properly in winter months. It is also extremely important to keep weather factors in mind, as excessive moisture can prohibit the sealant from bonding properly.

The OSTDOT is looking to coordinate chip sealing across much of the Reservation with the SDDOT. By doing this, it is anticipated that cost savings will be realized as contractors can perform chip seals over a much larger area and thus they typically offer lower rates for these services.

However, the substantial investment of \$2.0 million included in the TTIP for a multi-route chip seal is only roughly a third of the funds needed to cover the aging pavement system. In fact, it would take about \$840,000 annually to seal coat the entire pavement system on a 10-year cycle. With almost the entire pavement system being about 10 years old, consideration should be given to advancing another \$3.6 million during the short term to complete seal coats over a majority of the rest of the paved street system.





Surface Treatments - Preventive Maintenance

Surface treatments for flexible pavement surfaces include chip seals, slurry seals, and crack sealing. Sand seals can be applied to asphalt bike paths for their maintenance.

REHABILITATION

Rehabilitation applies road base and structural enhancements to improve a pavement's load-carrying capability and extend the service life. Most rehabilitation projects are designed to last 10 to 20 years. Although less costly than reconstruction, rehabilitation to improve the overall network condition still requires a prohibitive level of investment. Combined with a reconstruction program, rehabilitation can provide a marginal increase in pavement performance, but the results are not optimal.

Surface Treatments - Rehabilitation

Surface treatments for flexible pavement surfaces include microsurfacing, 3/4-inch overlays of ultrathin hot-mix asphalt, and 1.5-inch hot-mix asphalt overlays. In some situations, it is cost-effective to treat curb and gutter pavement sections by cold milling and resurfacing with a 1.5-inch hot-mix asphalt overlay.

RECONSTRUCTION

Reconstruction involves the complete replacement of the pavement structure and subgrade with a new equivalent. This improvement is designed to last at least 20 years. Most favorable to the traveling public, reconstruction is also the most expensive fix. Like most transportation agencies, The OST does not have sufficient funds to sustain the level of investment for continual reconstruction of the highway network. In addition, directing available funds to highway reconstruction neglects the majority of the network.

Because of limited funding, some reconstruction projects may wait years for funding to be available. Therefore, it would be beneficial for the maintenance program to include funds needed to repair potholes and to patch sections of roadway that become a safety hazard.

COST BENEFITS OF PREVENTIVE MAINTENANCE

Approximate contracted out costs per mile for various improvement types associated with paving projects on the Reservation are listed in Figure 5-1. It is very important to keep track of all associated maintenance costs (crack sealing, seal coating, etc.). No matter how minor the task being performed, accurate and concise cost tracking will enable more accurate programming, scheduling, and budgeting.





Figure 5-1 - Average Costs of Improvements

Improvement Type	Cost per Mile*
Reconstruction	\$ 1,700,000.00
Structural Overlay	\$ 500,000.00
Non-structural Overlay	\$ 275,000.00
Chip Seal	\$ 35,000.00

*Costs include TERO fees, engineering design and construction observation.

The estimated costs are assumptions in 2018 US Dollars for contracting purposes. These are estimates based on recent similar projects and Average Bid Prices. For planning and budgeting purposes, construction costs should be expected to increase at a 5 to 6 percent annual inflation rate.

There is a saying that you don't want to improve the worst roads first. This is backed up by research. It is more cost efficient to keep a good road in operating condition than to replace an aging road. By putting money upfront into seal coating, crack sealing, etc., the roadway's life can be extended far more efficiently than waiting until structural improvements are required (overlays, milling, reconstruction, etc.).

Pavement preservation postpones costly reconstruction or rehabilitation activities by extending the service life of the original pavement. The challenge is to ascertain the right time to apply a treatment to achieve maximum benefit or return on investment.

Preventative maintenance, as indicated in Figure 5-1, is much cheaper than corrective maintenance. Figure 5-2 provides a simplified depiction of the life-extending benefit of a treatment. The graph shows a typical deterioration curve interrupted when a preventive maintenance treatment is applied to a pavement in good condition. The preventive maintenance improves the condition for a period, until the pavement returns to the condition before the treatment. The time the pavement condition was improved by the treatment is the life extension given to the original pavement, or the extended service life.

The pavement management system's measurements of pavement condition over a period of time before and after the application of preventive maintenance makes it possible to determine the extended service life of a treatment. This is reflected in Figure 5-2.

With no service life remaining, pavements are candidates only for rehabilitation and reconstruction. Corrective and emergency repairs occur when the roads are more deteriorated or have lower PASER ratings and require costly structural overlays or reconstruction. Large surges in construction can be devastating to overall maintenance. First, large fluctuations in



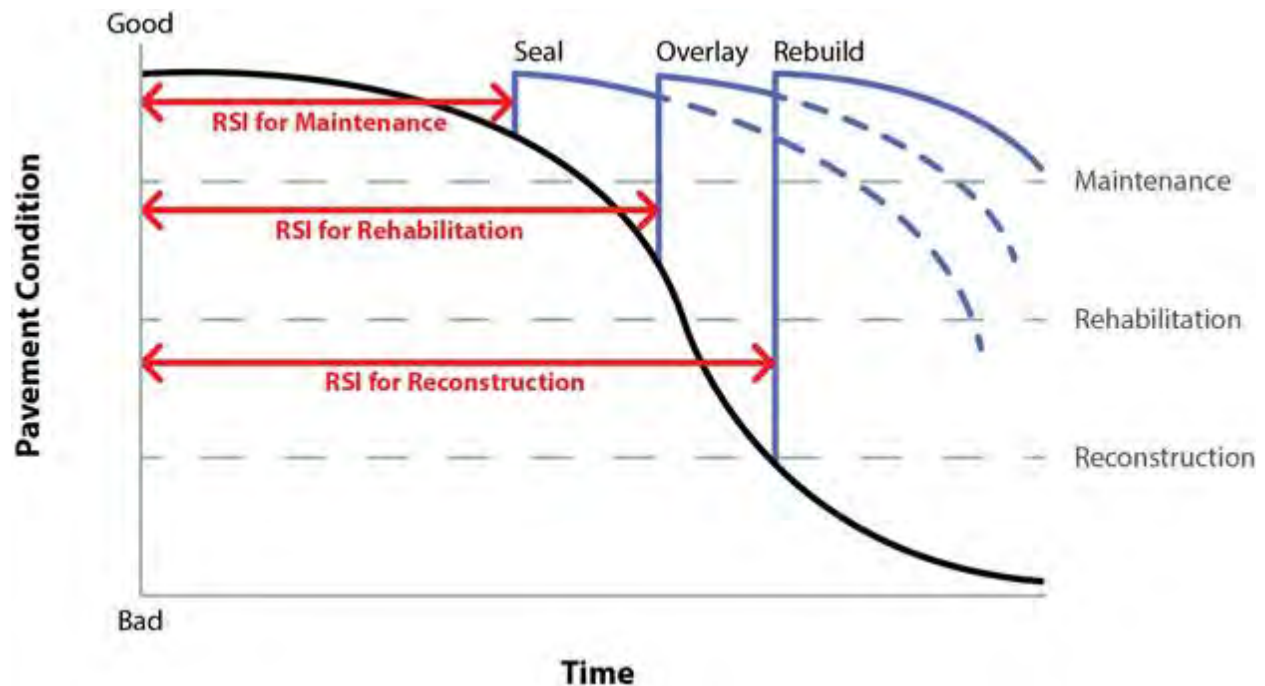


funding are required and are not supported by available funds. Second, the variation in construction activities from year to year impacts the steady flow of projects.

Preventive maintenance can alter the distribution of a pavement's remaining service life. By targeting large concentrations of pavements with similar remaining service lives, preventive maintenance treatments can balance projected workloads before a management problem develops. Balancing the remaining life of the network pavements will ensure manageable workloads at available funding.

The "pavement preservation and maintenance first" approach helps optimize available funds to meet network condition needs. Integrating pavement preservation with reconstruction and rehabilitation produces dramatic results in the network's condition. Pavement preservation is the only cost-effective means to improve overall pavement condition.

Figure 5-2 - Life-extending Benefit of Preventive Maintenance Treatment





ESTABLISH A SCHEDULE FOR PAVEMENT PRESERVATION AND MAINTENANCE

Once the condition of the pavement system was known, pavements were placed in categories ranging from good to poor. To address identified pavement conditions, the proposed strategy was to implement a four-tiered program of reconstruction, rehabilitation, pavement preservation and preventive maintenance. This approach addresses paved roads in the worst through reconstruction, in poor condition by rehabilitation, and in good condition with aggressive pavement preservation and preventive maintenance.

A pavement preservation and maintenance schedule is recommended for all paved roadways within the Pine Ridge Indian Reservation. This schedule will be finalized through the LRTP review process. Ideally, the OST's RMD or hired contractors will undertake crack sealing and routing the year prior to scheduled seal coat projects. Seal coat projects should be scheduled on a rotation of once every 7-10 years on all paved facilities. This should eventually include annual or biennial surveys of the sidewalk system to identify and correct encroaching foliage, pavement deterioration and trip hazards.

A 20-year life cycle is typically associated with asphalt pavement under moderate stress. Using a 20-year life cycle, asphalt overlays would ideally be completed every 15 years to minimize the potential for severe pavement deterioration that would require costly reconstruction to rehabilitate. However, on local roads where truck travel is uncommon, useful pavement life may extend beyond 20 years if maintained with timely crack filling and seal coats.

Given there are 240 miles of asphalt BIA and Tribal roads on the Reservation, using 20 years as the overlay cycle would require an average 12 miles be overlaid yearly. In addition, the Tribe should implement a seal coat program that covers their entire paved system. Roadways should be seal coated approximately every 7-10 years. In other words, the Tribe should be placing an average of about 24-34 miles of chip seal per year (assuming the entire 240-mile pavement system is included in the rotation). Instead of annual chip seal projects, it might make more sense to chip seal half the system (120 miles) every 5 years, for better unit costs.

ADDRESS OVER-WEIGHT TRUCKS ON RESERVATION ROADS

It is common for road jurisdictions to be compensated for damage to roads that occurs because of over-weight trucks and hauling activities from nearby construction or industry. This damage can significantly reduce the longevity of both paved and gravel road conditions.

The OST currently uses haul road agreements with construction projects and contractors have to repair roadways stressed by construction hauling. The OST has considered use of scales and haul road fees in the past but has been reluctant because ordinances have not been established and the ability to collect fines and enforce compliance is limited. It is recommended that Tribal attorneys investigate the matter and provide the necessary ordinances and enforcement procedures to make it feasible for the OST to collect fees and fines for all over-weight trucks.





UNDERTAKE SHORT AND LONG RANGE PAVING PROJECTS

Roughly 93% of the TTP funds received by the OST is used for maintenance of the current BIA asphalt road system, and many of those roads still require costly reconstruction. There is a desire for new paved roads within the Reservation. Examples raised by the public include paving Mouse Creek Road from Wounded Knee to Batesland, paving BIA 33 from Red Cloud School to Manderson and paving the first two miles of BIA 25 north of BIA 2. While these and other paving projects are desired, spending TTP dollars to pave them will detract from available funding needed to correct pavement deficiencies elsewhere.

Adding more paved mileage for the OST Tribe to maintain would not only impact the ability to maintain the existing paved road system but would also reduce future opportunities to upgrade the gravel road system as well. If the paved roadway network is expanded, these additional roadway miles will require similar maintenance efforts and will increase the demands on an already over-extended pavement preservation and maintenance budget.

Short and long term priority projects were identified from the PMP, through technical analysis, and from input received from local staff and the public. These priority paving projects are shown in Figures 5-3 and 5-4:

Figure 5-3 - Short Range Priority Paving Projects

Project Name
Multi-Route Pavement Striping
Allen Road - BIA 4 Extension
BIA 2 - Sharps Corner to Kyle - Overlay
BIA 41 - BIA 32 North to US 18 - Overlay
BIA 41 - US 18 to White River - Overlay
Multi-Route Chip Seal
BIA 50 - Oglala Housing Streets
BIA 2 - Cury Table Overlay
BIA 32 - Pipe Repairs
BIA 2 Kyle to SD44
BIA 32 - Pine Ridge to BIA 41 - Spot Reconstruction and Add Gravel Shoulders
BIA 33/28 - Overlay BIA 14 to North
BIA 27 - Spot Road Repair South of Rockyford
BIA 33 - Manderson to US 18 [Holy Rosary]
Manderson Housing Streets
Wounded Knee Housing Streets





Figure 5-4 - Long Range Priority Paving Projects

BIA Route	Location	Length (Miles)	Average PASER Rating	ADT	Recommended Treatment Type	Estimated Cost	Notes
2	BIA 41 - BIA 27 (Cuny Table)	21.4	8-10	115	Chip Seal	\$ 910,000.00	Recently improved
2	BIA 27 - BIA 4	14.6	10	2186	Chip Seal	\$ 620,500.00	Recently improved
2	BIA 4 - SD 44	19.4	5-6	635	Reconstruction	\$ 36,000,000.00	Reconst. & shoulder widening
4	BIA 22 - BIA 63	2.9	10	1016	Chip Seal	\$ 123,250.00	Overlaid in 2017-2018
25	BIA 2 north	2.3	1	643	New Asphalt Paving	\$ 1,150,000.00	Northwest of Kyle
27	US 18 - North Res. Line	48.5	7-10	1554	Chip Seal	\$ 2,061,250.00	Improvements pending
28	Wounded Knee - Manderson	8.8	6	817	Overlay	\$ 2,420,000.00	Funding currently unavailable
32	Slim Butte - Pine Ridge	13	7-8	827	Overlay	\$ 5,000,000.00	Shoulder, sideslopes, culverts
33	Manderson to US Highway 18	13.8	1	65	New Asphalt Paving	\$ 23,460,000.00	Requested by Tribal Council
35	US 18 - W. to Oglala	5.9	3-5	1510	Structural Overlay	\$ 2,832,000.00	Concurrent with BIA 115
41	Slim Butte (BIA 32) - US 18	6.7	10	151	Chip Seal	\$ 284,750.00	Recently improved
41	US 18 - White River	10.4	6-7	606	Structural Overlay	\$ 6,000,000.00	to north of BIA 16
41	2.4 Miles S. of BIA 2 - 2.4 miles north	4.8	5-7	549	Reconstruction	\$ 5,100,000.00	Also shows up in SR Other
Ext BIA 27	North Res. Line - Scenic	6.8	-	798	Reconstruction	\$ 10,880,000.00	Potential grant application
	Potato Creek Access Reroute	0.2	-	-	New Construction	\$ 30,000.00	Too steep and winding
	All Thunder Valley Roads	0.8	-	-	New Construction	\$ 1,300,000.00	Asphalt paving
2	Near Thunder Valley	-	-	-	New Construction	\$ 150,000.00	Shoulder and turn lane additions
Misc.	Wind Farm Route Improvements	-	-	-	New Construction	\$ 30,000,000.00	Road, structural and drainage
Total						\$128,321,750.00	

RECOMMENDED STREET LIGHTING IMPROVEMENTS

A 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. It is recommended that the OST conduct a future study to identify the types and locations for needed street lighting throughout the Reservation, and that lighting improvements be prioritized and completed as funding becomes available.

COMPLETE BRIDGE IMPROVEMENT PROJECTS

Currently, bridge improvement projects are included in the TTIP for bridges A122, A133, A154, and A155. Future bridge improvement projects will be added as inspections indicate conditions merit action. After each inspection, needed maintenance activities should be undertaken to address issues identified in the inspection. A detailed list of bridge maintenance needs based on recent inspection reports has been provide to the OSTDOT.

A list of all bridges, their sufficiency ratings, and estimated maintenance costs from recent inspections is provided in Figure 5-5. Bridges with poor sufficiency ratings are highlighted, and no maintenance costs for those are listed since applications for extensive improvements have been submitted. Assuming the maintenance is typical for a 5-year period, this averages to \$26,000 per year.





Figure 5-5 -Estimated Bridge Maintenance Costs

Structure Number	Feature Intersected	BIA Route Number	Location	Sufficiency Rating	Estimated Maintenance Cost
A021	COTTONWOOD CREEK	27	8 KM NORTH OF ROCKYFORD	90.7	\$ 13,900.00
A023	WHITE RIVER	2	4.3 KM NW OF ROCKYFORD	99.9	\$ 7,000.00
A028	POTATO CREEK	2	8.9 KM WEST OF SD HWY 44	82.3	\$ 2,100.00
A103	WHITE RIVER	41	19.3 KM NW OF OGLALA	85.9	\$ 6,300.00
A112	WHITE RIVER	27	4 KM N OF ROCKYFORD	94.4	\$ 10,700.00
A115	BEAR IN THE LODGE CREEK	1	8 KM S 7.2 KM E INTERIOR	99.4	\$ 20,900.00
A116	EAGLES NEST CREEK	1	14.5 KM SE OF INTERIOR	99.4	\$ 3,300.00
A122	CORN CREEK	6	21 KM NE OF ALLEN	36.7	NA
A129	MEDICINE ROOT CREEK	2	0.5 KM EAST OF KYLE	81.9	\$ 1,000.00
A130	WHITE RIVER	3202	10 KM EAST OF SLIM BUTTE	96.5	\$ 6,000.00
A133	ROUTE 27 DRAIN CHANNEL	49	0.2 KM E OF RTE 27&28 JCT	56.5	NA
A136	WHITE CLAY CREEK	36	0.3KM E OF OGLALA SCHOOL	81.1	\$ 3,700.00
A144	WOUNDED KNEE CREEK	33	2.6KM N OF MANDERSON	84.3	\$ 500.00
A145	WOUNDED KNEE CREEK	8	1.3KM W OF BIA ROUTE 33	75.8	NA
A147	BEAR IN THE LODGE CREEK	6	1 KM N OF HISLE	99.8	\$ 2,500.00
A148	BEAR IN THE LODGE CREEK	1	0.5 KM N OF HISLE	99.7	\$ 500.00
A153	WOUNDED KNEE CREEK	27	0.7KM NE OF RTES 27 & 28	96.8	\$ 5,000.00
A154	WHITE RIVER	88	10KM NE OF OGLALA	54	NA
A155	WHITE RIVER	90	1.4KM SOUTH OF BIA RTE 18	47.1	NA
A156	WHITE RIVER	32	12.3KM SW OF OGLALA	99.1	\$ 31,500.00
B00157	MEDICINE ROOT CREEK	25	9.7KM NW OF KYLE	99.6	\$ 13,500.00
B00158	MEDICINE ROOT CREEK	25	8.1KM NW OF KYLE	99.6	\$ 1,500.00
B00159	AMERICAN HORSE CREEK	25	3.1KM SW OF KYLE	99.6	NA
B0160	SQUAW CREEK	2	5.0KM WEST OF BIA 41	100	NA
B0161	BEAR IN THE LODGE CREEK	4	0.3KM S OF ALLEN SCHOOL	100	NA
Totals					\$ 129,900.00





CHAPTER 6 - NON-PAVED ROADWAY RECOMMENDATIONS

Recommendations for non-paved roadways address the need for use of good roadway materials and surface treatments, as well as proper drainage and the implementation of improvements through gravel rehabilitation and maintenance programs.

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 LTAP Gravel Roads Maintenance and Design Manual published November 2000, and Low-Volume Roads Engineering published by the Bureau of Land Management updated June 2011.

SURFACE AND BASE MATERIALS

Roadway surface conditions can be dramatically improved when better materials are used and there is proper drainage. Gravel performs well when the right gradation is used, and it can perform nearly as well as pavement. A study that was just starting while this report was being prepared was called the Gravel Pit Exploration Study. It is anticipated that new gravel sources, once they become available, will allow the OST to have better success in providing quality gravel materials on their roads.

MAINTENANCE

Effective roadway maintenance techniques are outlined in the USDOT Gravel Roads Maintenance and Design Manual. According to this 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 is 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. Ditch inslopes should be mowed. This will also improve visibility, resulting in improved safety. Whenever possible, ditches should be provided and upgraded as needed to allow good drainage to occur and to provide additional snow storage. This may require replacement or addition of new culverts.

The FHWA Gravel Roads Construction & Maintenance Guide published August 2015, 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. Given that funding and availability of RMD staff is limited, a strategy to blade each primitive road annually may be a reasonable future goal. Priorities should continue to focus on roads that have higher levels of use. 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 often have less than the desired impacts on fixing the problem. Gravel rehabilitation may also be used as an interim step towards future paving.

SURFACE TREATMENTS

Surface treatments can be applied to reduce dust and to stabilize loose surface gravel. Magnesium chloride is a chemical effective in dust control. It costs 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.

GRAVEL PROJECT PRIORITIES

The OST has a significant funding shortfall which limits their abilities to maintain their overall road system. In recent years, the OST has dedicated only \$521,000 annually to maintain their paved and non-paved roads and bridges. Subtracting \$200,000 annually for personnel overhead, and supplementing with \$150,000 annually from their construction program, that leaves only \$471,000 a year available for overall maintenance. Only maintenance under \$500,000 or less than 25% of the TTP annually (whichever is greater) is TTP funding eligible.

Roughly 7% of the OST's TTP funds are dedicated to the gravel road system. It is difficult to establish priorities when funds are not sufficient to complete more than a small percentage of what should be done. Currently, the OST is in a crisis mode of responding to significant issues as they arise. Yet there still could be benefits from establishing some ideal goals for gravel road maintenance.

Whether the OST can blade all their minimum maintenance roads annually, semiannually, or a certain number of miles per year, pursuit of this goal for routine road maintenance on their primitive and gravel road systems would be ideal. It could also be beneficial to pursue this goal in coordination with the counties.





Once new pit sources become available, placement of new gravel on roads that have regularly required a high level of maintenance should reduce the maintenance demand on those roads (assuming that any existing drainage issues are also addressed). The OSLH has stated that they can assist with placement of gravel on subdivision roads once a better gravel source becomes available. Coordination between OSTDOT, the RMD, and OSLH should facilitate this effort.

Current gravel project priorities for the OST have been identified and are shown in Figure 6-1.

Discuss table with Dave.

Figure 6-1 - Gravel Surfacing Maintenance Project Priorities

BIA Route	Location	Length (Miles)	Notes & Recommendations	Estimated Cost
33	Manderson to US Highway 18	13.8	Gravel Rehabilitation	\$ 8,000,000
26	BIA 2 to BIA 25	1.9	Kyle Cut Across	\$ 1,425,000
	Medicine Root Road	0.3	Needs repair - in Kyle	\$ 45,000
	Craven Road Solid Waste Site	0.1	Site is muddy and needs gravel	\$ 1,000
	Craven Road	18		
17	American Horse Creek Road	18.3	Build up higher and regravels	\$ 2,745,000
	Potato Creek Access Reroute	0.2	Too steep and winding	\$ 150,000
25	North Route north of Kyle	4.4	Gravel and/or Paving	\$ 660,000
17	5-mile to Batesland			
16	North of Oglala	3	Continued upgrades	
29	Wolf Creek Housing Road	2	Address wash boards	\$ 10,000
	Mouse Creek Road		Gravel or pavement upgrade	
24	Grass Creek Rd - Oglala to Manderson		Gravel and Route upgrades	





CHAPTER 7 - MULTIMODAL RECOMMENDATIONS

The Pine Ridge Indian Reservation has a high percentage of people who walk, bike and/or use transit as their primary means of travel. Therefore, it is very appropriate to devote significant attention to finding opportunities to improve non-vehicular modes of transportation.

In this chapter, a comprehensive strategy for pedestrian and bicycle facility improvements and transit facilities and operations will be established.

PEDESTRIAN AND BICYCLE FACILITY IMPROVEMENTS

The current Pine Ridge transportation network has some very good pedestrian and bicycle facilities, but there is certainly room for improvement. Designing roadways to accommodate all types of users is commonly termed “complete streets.” This type of roadway design approach 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, as well as bike racks. Provision of bike racks at high-use destinations adds a level of security and establishes the locations where people may park their bikes. There are numerous locations where bike racks would be beneficial. These include the schools, Tribal offices, convenience stores, transit stops, and existing or proposed transit shelters. It is recommended that bike racks be installed at these locations whenever funding can be obtained.





The Tribal Transportation Safety Plan identified locations within the Pine Ridge Indian Reservation where there is pedestrian/bike traffic and there is a specific need for pathways.

These locations include Kyle, Manderson and SD 407 south of Pine Ridge. Chapter 3 discussed additional important locations in Allen, Batesland, Oglala, Pine Ridge, Porcupine, and Wanblee that need sidewalks, shared use paths, and/or lighting improvements.



While the SDDPS crash data does not identify pedestrians or bikes as a major crash cause, the data provided by the OSTDPS shows that pedestrian crashes are a top 10 crash cause and have accounted for seven percent of all fatalities from 2010 to 2014. Shared-use paths need to be considered to separate pedestrians and bicycles from vehicle traffic. The need for these pathways has been present for some time and has increased as new Tribal housing has been developed. There is also a need for better access between Tribal communities and schools.

Locations of existing and recommended pedestrian and bicycle facilities on the Reservation are shown in Chapter 3. It is recommended that Tribal priorities be established for construction of new 5-foot sidewalks (6-foot for curb-side sidewalks), 10-foot shared-use paths and pathway lighting projects. Suggested priorities for new sidewalks, shared-use paths, and pathway lighting projects are shown in Figure 7-1. Path and path lighting projects should be completed together for cost savings if funding allows.

FIGURE 7-1 - Suggested Sidewalk, Shared use Path, and Path Lighting Priorities

<u>Priority</u>	<u>BIA Route</u>	<u>Location</u>	<u>Length</u>	<u>Cost</u>	<u>Description</u>
1	BIA 2	Kyle	0.9	\$400,000.00	10 foot path
2	Allen Road/BIA 4	Allen Store to Oglala Lakota College	0.9	\$300,000.00	Path Lighting
3	BIA 2	Kyle	0.9	\$300,000.00	Path Lighting
4	BIA 28	Manderson	0.7	\$210,000.00	10 foot path
5	SD 407	Pine Ridge	1.3	\$390,000.00	10 foot path
6	BIA 28	Manderson	0.7	\$210,000.00	Path Lighting
7	SD 407	Pine Ridge	1.3	\$390,000.00	Path Lighting
8	Crazy Horse School	Wanblee	0.4	\$120,000.00	10 foot path
9	Crazy Horse School	Wanblee	0.4	\$120,000.00	Path Lighting
10	School/Main Street	Porcupine	0.8	\$240,000.00	10 foot path
11	US Hwy 18/Ash St.	Batesland	0.8	\$240,000.00	Path/Sidewalk
12	US Hwy 18/Ash St.	Batesland	0.8	\$240,000.00	Path Lighting
13	Hospital Connections	Pine Ridge	1.2	\$140,000.00	Sidewalk
14	BIA 41	Oglala	0.35	\$105,000.00	10 foot path
15	BIA 41	Oglala	0.35	\$105,000.00	Path Lighting
16	SD 73	Martin	0.3	\$ 60,000.00	Sidewalk
17	SD 44/Camp Ave.	Wanblee	0.45	\$135,000.00	10 foot path
18	Tiyoko Itopa Road	Wanblee	0.4	\$120,000.00	10 foot path





TRANSIT IMPROVEMENTS

It is recommended that as needs on the Reservation continue to change, the demand for transit services should be monitored. If installation of new transit shelters is desired, additional grant funding should be applied for to help pay for their installation. This could include provision of a transit shelter for the Thunder Valley subdivision under construction.

The OST Transit Program Director has indicated that there is a desire to expand transit services within the Pine Ridge Indian Reservation. This new route from Kyle to Martin should be established once further improvements to BIA 4 between Kyle and Allen make the route more accessible to transit buses. There have also been requests received for a future route that stops in Gordon, Nebraska. This route may be added if additional funding for this route is obtained.

New transit maps were prepared as part of the LRTP process. It is recommended that these new maps supersede ones currently used, which are black and white and difficult to read. It is further recommended that the condition of the fleet of transit busses and vans be monitored, and grant money should be sought for replacement vehicles as the fleet continues to age.





CHAPTER 8 - POLICY RECOMMENDATIONS

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

HOUSING, SOCIAL AND ECONOMIC DEVELOPMENT PRIORITIES

OSLH currently manages requests for new housing and development on the Pine Ridge 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.

Examples of promising housing lot availability lies in and around many of the OST towns and subdivisions. There are many vacant lots adjacent to quality roadways, water and sewer infrastructure, 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 corridors. Having optimal development locations mapped could improve and streamline the selection of better future development sites linked to available existing infrastructure.

OSLH maintains a limited fleet of equipment that is used to maintain subdivision roads and driveways. Their primary limitation in their ability to maintain these roads is a lack of quality gravel. New gravel sources could be the single most important factor in seeing improved road maintenance across the Pine Ridge Indian Reservation and their availability should be coordinated with OSLH. Improved connections to existing and future land uses will positively benefit the social and quality of life aspects for those living on the Reservation.

SYSTEM MANAGEMENT PRIORITIES

The OSTDOT focuses most of its limited funds on maintaining the asphalt pavements on BIA high-speed roadways. The OSTDOT inherited an aging system in 2007 when the OST went direct funding with FHWA. Additionally, some of the construction projects that were completed prior to 2007 did not have proper quality control and are now failing and need to be reconstructed.

The goal of this effort is to get all roads on a low-cost rotational schedule of crack sealing and seal coat maintenance. For this to happen, roads that are already in good condition will need





to be properly maintained and roads requiring structural overlays or full reconstruction will need to be completed as funding allows so they can be placed within this rotational schedule.

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

Priority #1 - Conduct normal maintenance and needed upgrades and/or repairs on existing bridges, culverts, and guardrails, and crack sealing and seal coats on paved BIA and Tribal facilities

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

Priority #3 - Complete overlays or reconstruction on paved BIA highways

Priority #4 - Correct gravel road surface and cross section/drainage deficiencies on primary routes

Priority #5 - Complete overlays and reconstruction on paved city and subdivision streets

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, and crack sealing and seal coats on paved BIA and Tribal facilities be given top priority over the rest of the transportation system. This will enable the Tribe to keep as much of their existing system in good condition as possible, without it getting in poor condition resulting in expensive reconstruction.

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.

Given the length of time that has passed since most of the paved roads on the Reservation has received a seal coat, it is recommended that they receive a seal coat as soon as possible, ideally in 2019. Then, in another 5 years roughly half the Reservation paved roads should receive another seal coat, with the other half receiving a seal coat in 5 years after that. This will allow half the Reservation to receive a seal coat every 5 years.

While not receiving as high a priority as paved routes, maintenance of the gravel road system is important to the mobility, economic viability, safety, and quality of life of many of the OST'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 OSTDOT 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 cross-section standards have been used, though no clear standards have been adopted. These 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 8-1 through 8-7.

FIGURE 8-1 - Standard High-Speed Paved BIA Road Typical Section

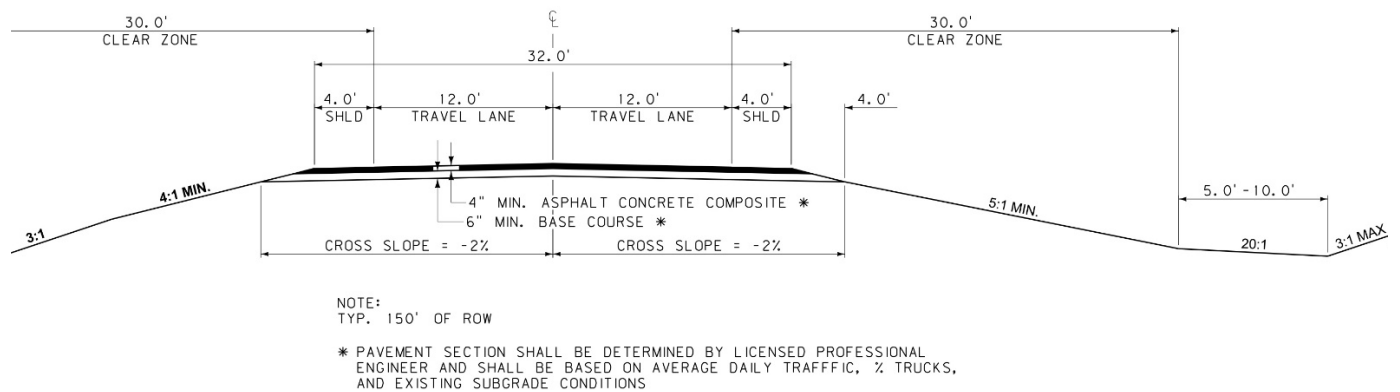


FIGURE 8-2 - Standard High-Speed Gravel Road Typical Section

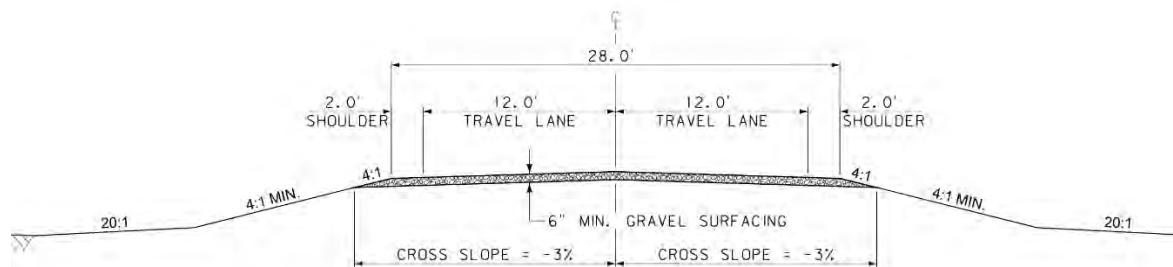




FIGURE 8-3 - Standard Low Speed Gravel Road Typical Section

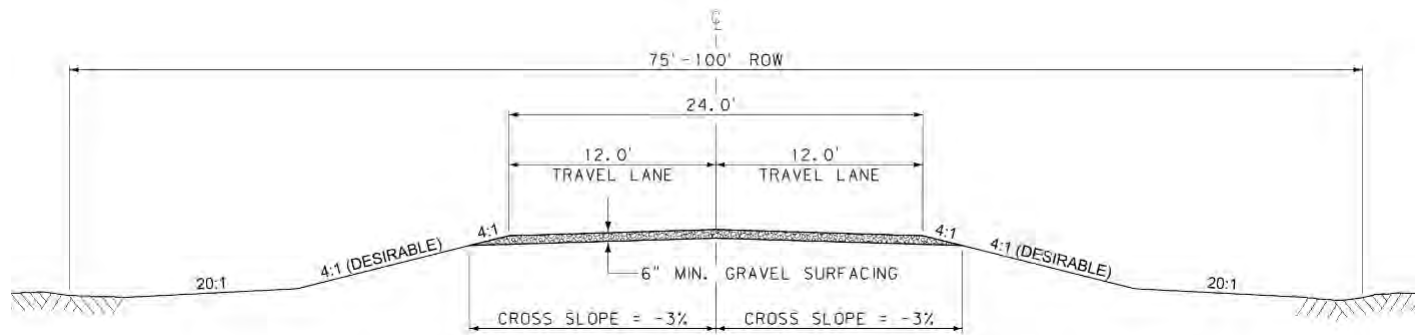
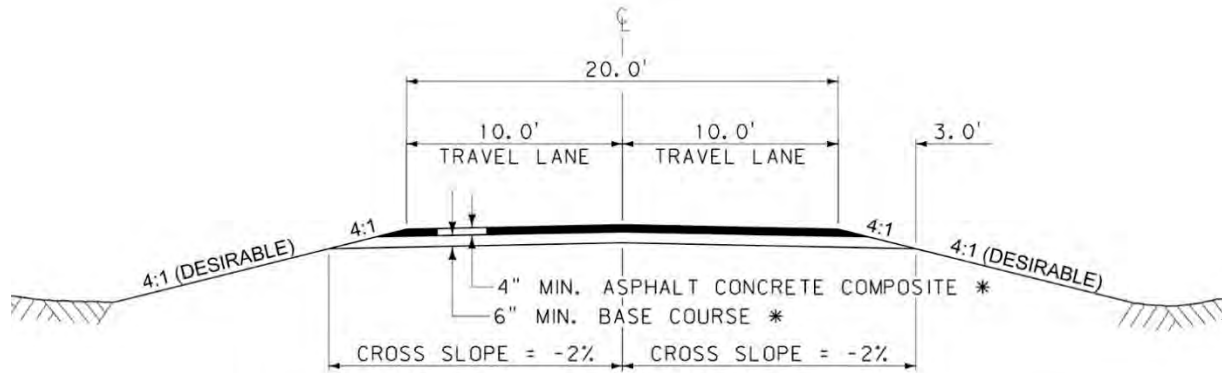
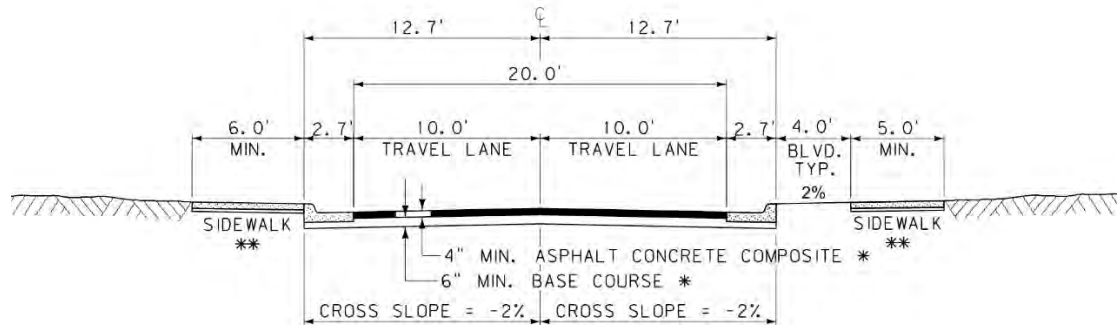


FIGURE 8-4 - Standard Tribal Housing & Residential Street Typical Section - Rural



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

FIGURE 8-5 - Standard Tribal Housing & Residential Street Typical Section - Urban



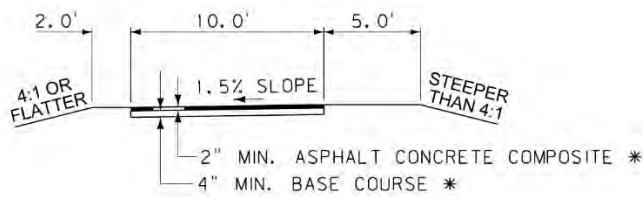
* PAVEMENT SECTION SHALL BE DETERMINED BY LICENSED PROFESSIONAL ENGINEER AND SHALL BE BASED ON AVERAGE DAILY TRAFFIC, % TRUCKS, AND EXISTING SUBGRADE CONDITIONS

** PAVEMENT SECTION SHALL BE DETERMINED BY LICENSED PROFESSIONAL ENGINEER





FIGURE 8-6 - Standard Separated Shared Use Path Typical Section

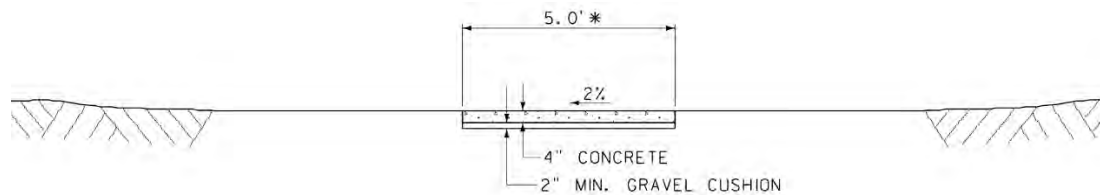


NOTE:

2" MIN. ASPHALT CONCRETE COMPOSITE OVER 4" MIN. BASE COURSE
OR
4" MIN. CONCRETE OVER 2" MIN. GRAVEL CUSHION

* PAVEMENT SECTION SHALL BE DETERMINED BY LICENSED PROFESSIONAL ENGINEER

FIGURE 8-7 - Standard Sidewalk Typical Section



* 6' WIDE IF ADJACENT TO CURB

AIRPORT PROPERTY DESIGNATION

Per the airport conditions discussion covered earlier in this report, the OST Tribal Council needs to act to legally designate the Tribal land for the existing and future airport boundary as "airport property".

DEVELOPMENT REVIEW

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

ENVIRONMENTAL CONSIDERATIONS

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





The OST 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 is a useful method to improve visibility resulting in fewer wild animals hit. Where applicable, provision of fencing is encouraged to further reduce safety concerns related to livestock in proximity to roads.

CULTURAL CONSIDERATIONS

The OST has many cultural sites that require access at various times throughout the year. These include the Wounded Knee Massacre Site, Red Cloud Heritage Center, Oglala Lakota College Cultural Heritage Center, White River Visitor Center, several pow wow locations, cemeteries, and many unique cultural sites. Many of these locations have access to good roads. Priority should be given to those cultural sites that do not have access to good roads.

ENERGY CONSERVATION CONSIDERATIONS

The OST has been using Light-Emitting Diode (LED) lighting for locations accessible to electric utilities, and Solar lighting for locations not accessible to utilities. The reason for LED preference has been that the maintenance cost for solar batteries is high and the performance of solar batteries is impacted by the colder weather. It is recommended that this energy conserving practice be continued until the cost and performance of solar batteries outweighs that for LED lighting.

Energy conservation can also be realized through improvements to roads that can serve as effective short cuts to other, longer routes. Most direct routes between towns are paved, although some gravel roads are more direct. Two such roads are BIA 24 between Oglala and Manderson, and BIA 33 between US Highway 18 and Manderson. The condition of these roads may limit their use as a desirable connection. Therefore, improvements to them have been proposed in this plan.

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.

There have been some efforts to explore a future wind farm located northwest of Potato Creek through Hisle. If plans move to implementation, the surrounding road system will need to be upgraded to handle the loads associated with wind farm construction and maintenance. This L RTP supports the implementation of wind energy on the Reservation. It is anticipated that the cost of transportation improvements associated with future wind energy will be paid for by the development.





CHAPTER 9 - PROJECT FUNDING ALTERNATIVES

US and State highways on the Reservation are currently funded and maintained by the SDDOT. There are multiple funding sources available for roads, bridges, sidewalks, trails, and transit which are not on the state highway system. The OSTDOT makes extensive efforts to apply for funding through available sources and has done so with great success. These funding source alternatives 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 these funds will total about \$6.76 million annually based on 2017 funding. It is uncertain whether these funds will increase or decrease moving forward. TTP funds are expected to account for roughly 80-90% of total Tribal transportation funding over the next few years.

The purpose of the TTP is to provide access to basic community services to enhance the quality of life in Indian country. 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.
- Up to 3% 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 Pine Ridge Tribal Transportation Improvement Program (TTIP). The TTIP is a 5-year document which describes the funding received by the OST and the projects and efforts undertaken to use those funds.

These funds are primarily used for maintenance of the paved BIA road system. They also provide a continuing annual allocation of \$150,000 for maintaining the gravel road system and \$75,000 for transit operations.





TRIBAL TRANSPORTATION PROGRAM SAFETY FUNDS

Tribal Transportation Program Safety Funds (TTPSF) are available to federally recognized Indian Tribes through a competitive, discretionary program. Awarded annually, projects are chosen whose outcomes will address the prevention and reduction of death or serious injuries in transportation related crashes. Eligible projects for the TTP Safety Fund under the FAST Act include: development and revision of transportation safety plans, crash data improvement, road safety audits, and other title-23 eligible activities, primarily infrastructure improvements.

In 2014 the OST was awarded \$12,500 to develop a safety plan. The OST TTSP was completed in 2016. Following plan completion, the OST submitted six TTPSF applications requesting a total of \$2.1 million for safety improvements.

It is recommended that the OST 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. This information 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.

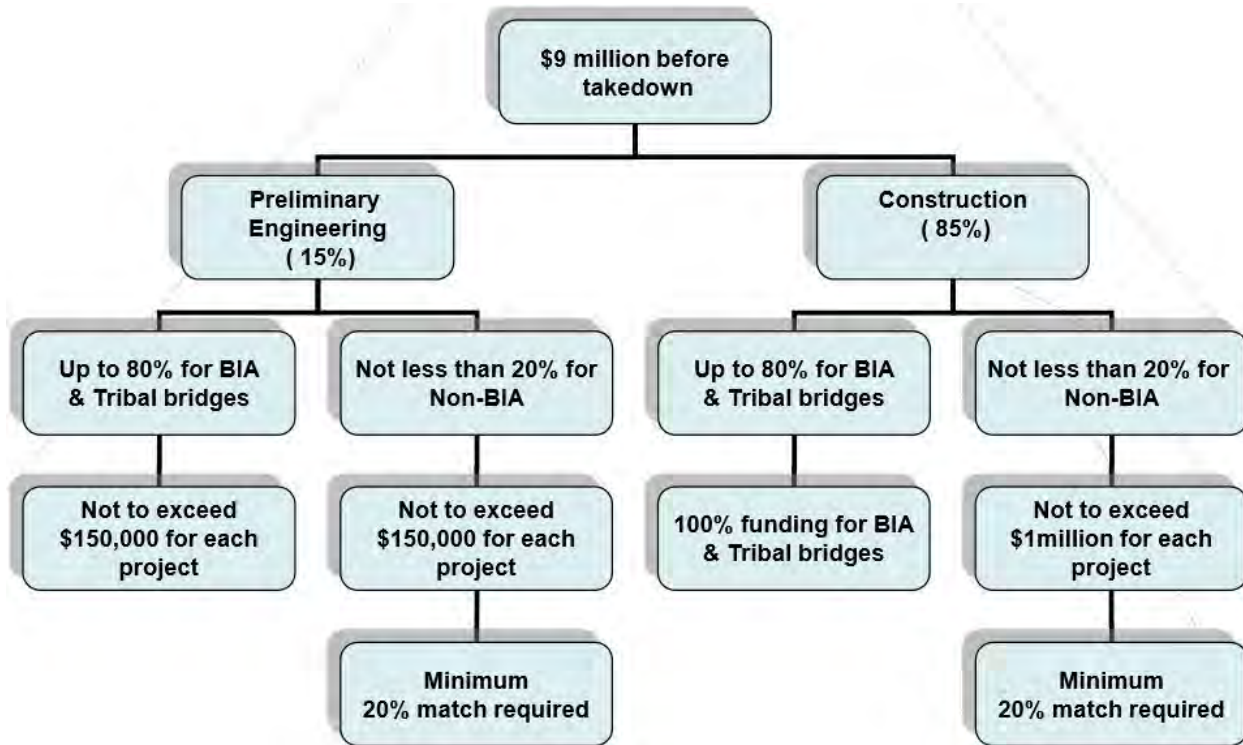
TTBP funds may be used for planning, design, engineering, preconstruction, construction, and inspection of a project to replace, rehabilitate, seismically retrofit, paint, or for anti-icing and deicing, or to implement any countermeasures (including multiple-pipe culverts) for eligible Tribal transportation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

MAP-21 requires the inspection of all public bridges including Tribal bridges be performed at least every 2 years, and the reporting of data into the FHWA National Bridge Inventory. To be eligible for funding, a bridge must have an opening of at least 20 feet, be classified as a Tribal transportation facility, and be structurally deficient or functionally obsolete. Figure 9-1 shows the annual Tribal bridge program funding that the OST can compete for on a national level.





FIGURE 9-1 - Annual Tribal Bridge Program Funding



TRANSPORTATION ALTERNATIVE & RECREATIONAL TRAILS FUNDING

Transportation Alternatives 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. The Transportation Alternatives (TA) Program replaces funding from *previous programs authorized under MAP-21*, including Transportation Enhancements, Recreational Trails, Safe Routes to School, and other discretionary programs. The Federal share for these projects is 86.58%, with the non-Federal share covered by the responsible jurisdiction. The award maximum is \$400,000.

Eligible categories include:

- On-road and off-road trail facilities for pedestrians and bicyclists, including ADA improvements;
- Historic preservation and rehabilitation of 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; and
- 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.

BUILD GRANTS

The OSTDOT 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.

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 TRANSPORTATION AUTHORITY (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.

SOUTH DAKOTA TRANSPORTATION ECONOMIC DEVELOPMENT PROGRAMS

The SDDOT 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.

LOCAL FEES AND TAXES

The OST has very limited resources for raising local funds. Some items that have been discussed include assessing a wheel tax on venders, fines for overweight vehicles, fees associated with haul road agreements, and permitting for loggers. Success in any of these ventures is tied to the ability to get Tribal attorneys to draft the regulations and laws, and for law enforcement and Tribal courts to provide needed enforcement.





RECOMMENDED FUNDING STRATEGY

It is more important than ever that the OST wisely spend the limited funds that are received and make necessary efforts to leverage additional funds from all competitive funding programs that apply to the project needs that exist. Future grant applications could be considered for any of the project needs identified in this LRTP.

Figure 9-2 provides a general guide for project types and funding mechanisms. It should be consulted on an annual basis to determine potential projects that fit within competitive programs. Once projects are identified, the Tribe should determine the appropriate timing to initiate funding applications.

FIGURE 9-2 - Funding Mechanisms by Project Type

Funding Program	Abbreviation	Funding Mechanism	Typical Project Type
Tribal Transportation Program Funds	TTP	Allocation	Roads
Tribal Safety Funds	TTPSF	Application	Studies, guard rail, hazard reduction
Tribal Bridge Program Funds	TTBP	Application	Bridges
Transportation Alternative Funding	TA	Application	Sidewalks and Multi-Use Trails
Better Utilizing Investments to Leverage Development Funds	BUILD	Application	Variety tied to economic development
Congestion Mitigation and Air Quality Funds	CMAQ	Application	Maintenance equipment
Transit	FTA	Application	Transit buses, transit shelters

Strategic decisions on where to use available funds must recognize that use of grant funds to address one need often frees up money to resolve another need. There are three grant applications that are currently under development and that are intended to be submitted prior to the next grant deadlines:

- **SDDOT Community Access Road Grant**
 - Roadway improvements and sidewalk installation near Crazy Horse School District in Wanblee, SD
 - Deadline: July 15, 2019
- **SDDOT Transportation Alternatives (TA) Grant**
 - Manderson Pathway (I just double checked with Tonya to confirm Manderson Pathway, not SD407 Pathway. I will let you know when I've heard back.)
 - Deadline: July 15, 2018 LOI is due; October 1, 2018 full application is due
- **USDOT Better Utilizing Investments to Leverage Development (BUILD) Grant**
 - BIA 2 from Kyle to SD 44
 - Deadline: July 19, 2018

An analysis was conducted to review how funding is currently planned within the TTIP, and to consider how much funding may be required for pavement preservation moving forward. Figure 9-3 shows annual averages of available and used funding from the 2018-2022 TTIP. It further demonstrates the importance of successful grant applications in the whole scheme of transportation system upgrades.





Figure 9-4 provides a guide for recommended average costs for possible project improvement strategies. Figure 9-4 also shows the balance of funding applied to new construction and reconstruction, major rehabilitation, pavement preservation and maintenance if most pavement preservation efforts are put on a 10-year cycle.

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 new construction and reconstruction, and major rehabilitation are not shown as these will generally be dependent upon success in submitting applications and competition against other submittals.





FIGURE 9-3 - Annual Tribal Program Funding

Available Funds (With Estimated Grants)	Annual Average	Recommended Average	Other Est. Annual Funds	
Est. TTP Formula Funds	\$6,760,060.00	\$6,760,060.00	TTP Safety Funds	\$560,000.00
Other Est. Annual Funds	\$1,240,000.00	\$1,240,000.00	TTP Bridge Funds	\$600,000.00
Total	\$8,000,060.00	\$8,000,060.00	TA Funds	\$80,000.00
			BUILD Grants	\$0.00
			Transit Funds	\$0.00
			Total	\$1,240,000.00

Approximate Funding Use (TTIP)	Annual Average	Recommended Average
Planning and Design	\$175,000.00	\$175,000.00
Transit	\$75,000.00	\$75,000.00
Bridge	\$600,000.00	\$600,000.00
Safety Projects	\$560,000.00	\$560,000.00
TA Projects	\$80,000.00	\$80,000.00
New Construction and Reconstruction	\$5,450,000.00	\$870,000.00
Major Rehabilitation	\$0.00	\$750,000.00
Pavement Preservation	\$3,848,600.00	\$4,088,000.00
Maintenance	\$574,214.00	\$810,000.00
Total	\$10,788,600.00	\$8,008,000.00

Available Funds (Without Grants)	Annual Average	Recommended Average
TTP Formula Funds	\$6,760,060.00	\$6,760,060.00
Total	\$6,760,060.00	\$6,760,060.00

Funding Use	Annual Average	Recommended Average
Planning and Design	\$175,000.00	\$175,000.00
Transit	\$75,000.00	\$75,000.00
Projects and Maintenance	\$6,510,060.00	\$6,510,060.00
Total	\$6,760,060.00	\$6,760,060.00

FIGURE 9-4 - Possible Annual Funding Use Strategy

New Construction and Reconstruction	Cost/Mile	Priority Miles	Miles/Year	Annual Cost
Street Construction/Reconstruction	\$1,700,000.00	36	0.5	\$850,000.00
Lighting (TA Match)	\$300,000.00	5.3	0.00	\$10,000.00
Sidewalks (TA Match)	\$200,000.00	2.3	0.00	\$0.00
Shared Use Paths (TA Match)	\$300,000.00	5.3	0.00	\$10,000.00
			Subtotal	\$870,000.00
Major Rehabilitation				
Major Surface Rehabilitation	\$750,000.00	0	0	\$0.00
Gravel Rehabilitation	\$150,000.00	20	5	\$750,000.00
			Subtotal	\$750,000.00
Pavement Preservation				
Chip Seal	\$35,000.00	240	24	\$840,000.00
Crack filling and sealing	\$2,000.00	240	24	\$48,000.00
4-Inch Structural Overlay	\$500,000.00	43.9	2	\$1,000,000.00
1-1/2 Inch Non-Structural Overlay	\$275,000.00	240	8	\$2,200,000.00
			Subtotal	\$4,088,000.00
Maintenance				
Patching (In Square Yards)	\$20.00	2000	200	\$4,000.00
Gravel Blading & Maintenance	\$5,000.00	1300	30	\$150,000.00
Conversion of Primitive to Gravel	\$82,000.00	0	0	\$0.00
Multi-Route Pavement Striping	\$2,000.00	240	240	\$480,000.00
Bridge and Culvert Maintenance	\$26,000.00	1 LS	1	\$26,000.00
Equipment Acquisition and Repairs	\$150,000.00	1 LS	1	\$150,000.00
Dust Control	\$8,000.00	0	0	\$0.00
			Subtotal	\$810,000.00
			Project Improvements	\$6,518,000.00





CHAPTER 10 - 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 initiated or completed by the end of the year 2022. To maintain the Tribe's economic sustainability, funding must be carefully distributed to the most critical locations.

Short range projects found in the TTIP are listed in Figure 10-1. It is recommended that the TTIP be amended to increase expenditures for seal coat priority projects. Currently, the TTIP includes \$2.0 million dollars for seal coat projects. This should be increased to \$4.575 million dollars to preserve roads that haven't received a seal coat since 2010-2012. These recommended seal coat projects are shown in Figure 10-2. For these to be completed in 2019, it is recommended that the BIA 41 reconstruction project between the North Reservation Line and 2.4 miles south of BIA 2 be dropped until a later date. This possible change to the next TTIP is reflected in Figure 10-3.

There are also many short-range projects anticipated to be completed under the Tribe's maintenance program. These are not specifically discussed but include various culvert replacements, gravel road improvement projects, and general maintenance activities.

Long range projects are those anticipated to be completed after the year 2022. 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 and costs are shown in Figure 10-4. They are currently considered long range because current and projected funding doesn't indicate the ability to initiate or complete them prior to 2023. If funding becomes available or if priorities change, it is possible some of these projects may move into the short-range element of the LRTP.





FIGURE 10-1 - Current Short Range Projects

OGLALA SIOUX TRIBE					
SUMMARY OF PROJECTS ON TTP - FY 2018-2022					
Project Name	FY 2018	FY 2019	FY 2020	FY2021	FY 2022
Transportation Planning	\$ 268,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000
TTP Program Management and Oversight	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
Road Maintenance	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
Heavy Equipment Acquisition and Repairs	\$ 500,000	\$ 500,000	\$ 150,000	\$ 150,000	\$ 150,000
Bus Transit Services	\$ 100,000	\$ 100,000	\$ 75,000	\$ 75,000	\$ 75,000
O&M Bridge Inspections	\$ 55,000		\$ 55,000		\$ 55,000
Multi-Route Pavement Striping	\$ 400,000	\$ 575,000	\$ 400,000	\$ 575,000	\$ 400,000
Allen Road - BIA 4 Extension	\$ 4,120,000				
BIA 27 - MP 43.8 - Emergency Pipe Culvert Repair (ERFD)	\$ 5,000				
BIA 27 - MP 44.5 - Emergency Pipe Culvert Repair (ERFD)	\$ 30,000				
BIA 27 - MP 47.7 - Emergency Pipe Culvert Repair (ERFD)	\$ 45,000				
BIA 2 - MP 3.2 Emergency Pipe Culvert Repair (ERFD)	\$ 10,000				
BIA 41 - North Reservation Line to 2.4 Miles South of BIA 2 - Reconstruction	\$ 2,900,000	\$ 2,800,000			
BIA 2 - Sharps Corner to Kyle - Overlay	\$ 2,707,000				
BIA 41 - BIA 32 North to US 18 - Overlay	\$ 2,400,000				
BIA 49 - Wounded Knee Bridge A133		\$ 230,000			
Multi-Route Chip Seal	\$ 1,200,000			\$ 800,000	
BIA 50 - Oglala Housing Streets	\$ 30,000	\$ 1,100,000			
Various Routes - Culvert Inventory, Inspections, & Rehabilitation		\$ 100,000			
BIA 6 - Wooden Bridge A122	\$ 45,000		\$ 300,000		
BIA 2 - Cung Table Overlay			\$ 5,000,000	\$ 2,000,000	\$ 2,000,000
BIA 90 - Moccasin Park Bridge A155	\$ 60,000		\$ 300,000		
BIA 88 - White River Bridge A154	\$ 135,000			\$ 1,200,000	\$ 542,660
BIA 32 - Pipe Repairs	\$ 100,000				
BIA 41 - US 18 to White River - Overlay				\$ 2,000,000	\$ 2,000,000
Kyle Pathway (Partial TA Funding)	\$ 31,000	\$ 563,890			
Kyle Pathway Lighting	\$ 28,000	\$ 347,000			
Allen Pathway Lighting	\$ 23,000	\$ 272,000			
Manderson Pathway	\$ 60,000		\$ 300,000		
SD407 Pathway	\$ 90,000			\$ 1,000,000	
School Zone Assessment and Implementation (Various Routes)	\$ 281,000				
Gravel Pit Exploration	\$ 120,000				
Gravel Pit Development		\$ 50,000	\$ 50,000		
Bridge Maintenance		\$ 50,000		\$ 50,000	
BIA 2 Kyle to SD44		\$ 30,000	\$ 100,000	\$ 200,000	\$ 200,000
BIA 32 - Pine Ridge to BIA 41 - Spot Reconstruction and Add Gravel Shoulders		\$ 100,000	\$ 1,000,000		
BIA 33 - MP5.5 Culvert Repair	\$ 20,000	\$ 250,000			
BIA 33/28 - Overlay BIA 14 to North			\$ 1,000,000	\$ 1,000,000	\$ 1,136,158
BIA 27 - Spot Road Repair South of Rockyford	\$ 120,000				
BIA 33 - Manderson to US 18 (Holy Rosary)		\$ 50,000	\$ 100,000	\$ 100,000	\$ 100,000
TOTAL PROPOSED EXPENDITURES	\$ 16,293,000	\$ 7,642,890	\$ 10,855,000	\$ 9,675,000	\$ 7,183,818
FUNDING					
FUNDS CARRIED OVER FROM PREVIOUS YEAR	\$ 10,053,752	\$ 2,057,468	\$ 2,778,638	\$ 1,083,698	\$ 423,758
ESTIMATED TTP FUNDS (BASED ON PREVIOUS 2017 FUNDING)	\$ 6,760,060	\$ 6,760,060	\$ 6,760,060	\$ 6,760,060	\$ 6,760,060
OGLALA HOUSING ?		\$ 300,000			
TTP BRIDGE FUNDING - INSPECTIONS		\$ 55,000		\$ 55,000	
TTP BRIDGE FUNDING PROPOSALS		\$ 230,000	\$ 1,500,000	\$ 1,200,000	
BIA 638 CONTRACT GRANT FOR MINING AND MINERAL	\$ 120,000				
ERFD FUND REIMBURSEMENT	\$ 934,656				
SDDOT TA FUNDING GRANT PROPOSAL (\$400,000)		\$ 400,000			
TTP SAFETY FUNDS PROPOSAL (\$2,101,000 Requested 12/2017)	\$ 482,000	\$ 619,000	\$ 300,000	\$ 1,000,000	
TOTAL AVAILABLE FUNDS	\$ 18,350,468	\$ 10,421,528	\$ 11,938,698	\$ 10,098,758	\$ 7,183,818
FUNDS CARRIED FORWARD	\$ 2,057,468	\$ 2,778,638	\$ 1,083,698	\$ 423,758	\$ -
12/27/2017					





FIGURE 10-2 - Recommended Short Range Seal Coat Projects

Priority	BIA Route	Location	Length (Miles)	PASER Rating	Year of Repair	ADT	Estimated Cost	Notes
1	28	Wounded Knee - Manderson	8.8	6	<2008	817	\$ 308,000.00	
2	4	BIA 63 - BIA 2	16.6	3-6	2010	738	\$ 581,000.00	
3	23	BIA 27 East	3.9	5	2010	582	\$ 136,500.00	
4	27	Porcupine Butte - Rockyford	21	5-6	2012	1744	\$ 735,000.00	2018 Spot Repair
5	39	BIA 4 - BIA 2	5	6	2010	254	\$ 175,000.00	East of Kyle
6	33	Manderson to BIA 14	6.5	7	2010	145	\$ 227,500.00	
7	122	E. of State 391	3.6	-	2010	67	\$ 126,000.00	
8	27	US 18 - Porcupine Butte	14.5	7-10	2010	1704	\$ 507,500.00	
9	41	US 18 - White River	10.4	6-7	2012	606	\$ 364,000.00	2021-2022 Overlay
10	41	White River - 2.4 Miles S. of BIA 2	10.3	7-8	2010	681	\$ 360,500.00	
11	-	Housing and Miscellaneous	30.1	-	<2008	-	\$ 1,053,500.00	
		Totals	130.7				\$ 4,574,500.00	

Housing and Miscellaneous

BIA Route	Location	Length (Miles)	PASER Rating	Year of Repair	ADT	Estimated Cost	Notes
	Kyle Housing Streets	3.9		<2008	NA	\$ 136,500.00	Need to be repaved
	Manderson Housing Streets	1.4		<2008	NA	\$ 49,000.00	
36	Pine Ridge Housing Streets	13.8	-	2010	varies	\$ 483,000.00	
	Wanblee School Housing Streets	0.4	-	<2008	NA	\$ 14,000.00	Condition to be field verified
	Wounded Knee Housing Streets	1.1	-	<2008	NA	\$ 38,500.00	Condition to be field verified
40	Loneman Housing	0.2	-	<2008	378	\$ 7,000.00	Condition to be field verified
43	Allen Housing	1.2	-	<2008	NA	\$ 42,000.00	Condition to be field verified
47	Porcupine School	1	-	<2008	645	\$ 35,000.00	Condition to be field verified
53	Sunrise Housing	1.3	-	<2008	926	\$ 45,500.00	Condition to be field verified
55	Sharps Corner Housing	0.3	-	<2008	477	\$ 10,500.00	Condition to be field verified
56	Governor Housing	0.5	-	<2008	355	\$ 17,500.00	Condition to be field verified
60	Evergreen Housing	1.6	-	<2008	1346	\$ 56,000.00	Condition to be field verified
62	Wakpamni Housing	0.4	-	<2008	237	\$ 14,000.00	Condition to be field verified
142	Oglala Loneman Pathway	2.8	-	<2008	NA	\$ 98,000.00	Condition to be field verified
272	Porcupine Store Link	0.2	-	<2008	NA	\$ 7,000.00	Condition to be field verified
	Totals	30.1				\$ 1,053,500.00	





FIGURE 10-3 - Recommended Short Projects (2019-2023)

Project Name	FY 2019	FY 2020	FY 2021	FY2022	FY 2023
Transportation Planning	\$ 268,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000
TTP Program Management and Oversight	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
Road Maintenance	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
Heavy Equipment Acquisition and Repairs	\$ 500,000	\$ 500,000	\$ 150,000	\$ 150,000	\$ 150,000
Bus Transit Services	\$ 100,000	\$ 100,000	\$ 75,000	\$ 75,000	\$ 75,000
DST Bridge Inspections		\$ 55,000		\$ 55,000	
Multi-Route Pavement Striping	\$ 575,000	\$ 400,000	\$ 575,000	\$ 400,000	\$ 575,000
Allen Road - BIA 4 Extension					
BIA 27 - MP 43.6 - Emergency Pipe Culvert Repair (ERFD)					
BIA 27 - MP 44.5 - Emergency Pipe Culvert Repair (ERFD)					
BIA 27 - MP 47.7 - Emergency Pipe Culvert Repair (ERFD)					
BIA 2 - MP 3.2 Emergency Pipe Culvert Repair (ERFD)					
BIA 41 - North Reseal/Seal Line to 2.3 Miles South of BIA 2 - Reconstruction					
BIA 2 - Sharps Corner to Kyle - Overlay					
BIA 41 - BIA 32 North to US 18 - Overlay					
BIA 49 - Wounded Knee Bridge A133	\$ 230,000				
Multi-Route Chip Seal	\$ 4,575,000				
BIA 50 - Oglala Housing Streets	\$ 1,100,000				
Various Routes - Culvert Inventory, Inspections, & Rehabilitation	\$ 100,000				
BIA 6 - Wooden Bridge A122		\$ 800,000			
BIA 2 - Cuny Table Overlay		\$ 5,000,000	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000
BIA 30 - Moccasin Park Bridge A155		\$ 800,000			
BIA 88 - White River Bridge A154			\$ 1,200,000	\$ 542,660	\$ 542,660
BIA 32 - Pipe Repairs					
BIA 41 - US 18 to White River - Overlay			\$ 2,000,000	\$ 2,000,000	\$ 2,000,000
Kyle Pathway (Partial TA Funding)	\$ 563,830				
Kyle Pathway Lighting	\$ 347,000				
Allen Pathway Lighting	\$ 272,000				
Manderson Pathway		\$ 800,000			
SD407 Pathway			\$ 1,000,000		
Gravel Pit Development	\$ 50,000	\$ 50,000			
Bridge Maintenance	\$ 50,000		\$ 50,000		
BIA 2 Kyle to SD44	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
BIA 32 - Pine Ridge to BIA 41 - Spot Reconstruction and Add Gravel Shoulders	\$ 100,000	\$ 1,000,000			
BIA 33 - MP5.5 Culvert Repair	\$ 250,000				
BIA 33/28 - Overlay BIA 14 to North		\$ 1,000,000	\$ 1,000,000	\$ 1,136,158	\$ 1,136,158
BIA 27 - Spot Road Repair South of Rockyford	\$ 120,000				
BIA 33 - Manderson to US 18 (Holy Rosary)	\$ 50,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
Manderson Housing Streets					
TOTAL PROPOSED EXPENDITURES	\$ 9,800,890	\$ 11,330,000	\$ 8,875,000	\$ 7,183,818	\$ 7,303,818
FUNDING					
FUNDS CARRIED OVER FROM PREVIOUS YEAR	\$ 3,556,495	\$ 2,475,495	\$ 318,195	\$ 1,670,895	\$ 1,859,777
ESTIMATED TTP FUNDS (BASED ON PREVIOUS 2017 FUNDING)	\$ 7,115,830	\$ 7,372,700	\$ 7,372,700	\$ 7,372,700	\$ 7,372,700
OGLALA HOUSING ?	\$ 300,000				
TTP BRIDGE FUNDING - INSPECTIONS	\$ 55,000		\$ 55,000		
TTP BRIDGE FUNDING PROPOSALS	\$ 230,000	\$ 1,500,000	\$ 1,200,000		
BIA 638 CONTRACT GRANT FOR MINING AND MINERAL					
ERFD FUND REIMBURSEMENT					
SDDOT TA FUNDING GRANT PROPOSAL (\$400,000)	\$ 400,000				
TTP SAFETY FUNDS PROPOSAL (\$2,101,000 Requested 12/2017)	\$ 615,000	\$ 800,000	\$ 1,000,000		
TOTAL AVAILABLE FUNDS	\$ 12,276,385	\$ 12,248,195	\$ 10,545,895	\$ 9,043,595	\$ 9,232,477
FUNDS CARRIED FORWARD	\$ 2,475,495	\$ 318,195	\$ 1,670,895	\$ 1,859,777	\$ 1,928,659
6/15/2018					





FIGURE 10-4 - Long Range Projects and Costs

BIA Route	Location	Length (Miles)	Average PASER Rating	ADT	Recommended Treatment Type	Estimated Cost	Notes
2	BIA 41 - BIA 27 (Cuny Table)	21.4	8-10	115	Chip Seal	\$ 910,000.00	Recently improved
2	BIA 27 - BIA 4	14.6	10	2186	Chip Seal	\$ 620,500.00	Recently improved
2	BIA 4 - SD 44	19.4	5-6	635	Reconstruction	\$ 36,000,000.00	Reconst. & shoulder widening
4	BIA 22 - BIA 63	2.9	10	1016	Chip Seal	\$ 123,250.00	Overlaid in 2017-2018
25	BIA 2 north	2.3	1	643	New Asphalt Paving	\$ 1,150,000.00	Northwest of Kyle
26	BIA 2 to BIA 25	1.9	1	844	Gravel Rehabilitation	\$ 1,425,000.00	Kyle Cut Across
27	US 18 - North Res. Line	48.5	7-10	1554	Chip Seal	\$ 2,061,250.00	Improvements pending
28	Wounded Knee - Manderson	8.8	6	817	Overlay	\$ 2,420,000.00	Funding currently unavailable
32	Slim Butte - Pine Ridge	13	7-8	827	Overlay	\$ 5,000,000.00	Shoulder, sideslopes, culverts
33	Manderson to US Highway 18	13.8	1	65	New Asphalt Paving	\$ 23,460,000.00	Requested by Tribal Council
35	US 18 - W. to Oglala	5.9	3-5	1510	Structural Overlay	\$ 2,832,000.00	Concurrent with BIA 115
41	Slim Butte (BIA 32) - US 18	6.7	10	151	Chip Seal	\$ 284,750.00	Recently improved
41	US 18 - White River	10.4	6-7	606	Structural Overlay	\$ 6,000,000.00	to north of BIA 16
41	2.4 Miles S. of BIA 2 - 2.4 miles north	4.8	5-7	549	Reconstruction	\$ 5,100,000.00	Also shows up in SR Other
Ext BIA 27	North Res. Line - Scenic	6.8	-	798	Reconstruction	\$ 10,880,000.00	Potential grant application
	Medicine Root Road	0.2	-	643	Blade and Gravel	\$ 10,000.00	Needs repair - in Kyle
BIA 1	Craven Road Solid Waste Site	-	-	-	Blade and Gravel	\$ 10,000.00	Site is muddy and needs gravel
17	American Horse Creek Road	18.3	-	-	Blade and Gravel	\$ 100,000.00	Build up higher and regravel
	Potato Creek Access Reroute	0.2	-	-	New Construction	\$ 30,000.00	Too steep and winding
25	North Route north of Kyle	4.4	-	-	Blade and Gravel	\$ 22,000.00	Gravel and/or Paving
17	5-mile to Batesland		-	-			
16	North of Oglala	3	-	-	Blade, Gravel, Drainage	\$ 15,000.00	Continued upgrades
29	Wolf Creek Housing Road	2	-	-	Blade and Gravel	\$ 10,000.00	Address wash boards
	Mouse Creek Road	13.5	-	-	Blade and Gravel	\$ 68,000.00	Gravel or pavement upgrade
	All Thunder Valley Roads	0.8	-	-	New Construction	\$ 1,300,000.00	Asphalt paving
24	Grass Creek Rd - Oglala to Manderson	21	-	-	Blade and Gravel	\$ 210,000.00	Gravel and Route upgrades
	Miscellaneous Locations		-	-	New Construction	\$ 150,000.00	Construction of 8 Transit Shelters
2	Near Thunder Valley	-	-	-	New Construction	\$ 150,000.00	Shoulder and turn lane additions
Misc.	Wind Farm Route Improvements	-	-	-	New Construction	\$ 30,000,000.00	Road, structural and drainage
Total						\$130,341,750.00	





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:

- 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. The intent of this undertaking is to verify that appropriate traffic control signing (stop and yield signs) are in place, increasing safety for the traveling public.
- Erosion Control Standards - New standards should be established; locations where significant erosion issues exist should be identified and corrective measures should be developed and implemented. Recent project activity should be reviewed to determine the effectiveness of erosion measures, and methods to enhance erosion control on future projects should be explored.
- Update the 2011 Pine Ridge Emergency Operations Plan as needed.
- Future utilities should be planned and mapped to improve coordination with future transportation improvement projects.
- Non-paved roadway conditions survey - a methodology 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.
- Functional Classification Coordination - differences between the RIFDS and SDDOT functional classification maps should be addressed, with both systems updated accordingly.
- Complete a study of street lighting conditions and needs within OST towns and subdivisions.
- Complete a study and mapping of utility locations and conditions across the Reservation.
- Conduct a PASER Study of paved town and subdivision streets

FISCAL YEAR 2017 RIFDS INVENTORY

A summary spreadsheet of the Fiscal Year 2017 Road Inventory Field Data System (RIFDS) information is attached for reference as Appendix C. The RIFDS downloaded in June 2018 needs corrections as there are items missing. Most of these updates are currently in process but have not yet been approved.

