

OGLALA SIOUX TRIBE

LONG RANGE TRANSPORTATION PLAN

OCTOBER 2018

RESOLUTION NO. 18-171

RESOLUTION OF THE OGLALA SIOUX TRIBAL COUNCIL
OF THE OGLALA SIOUX TRIBE
(An Unincorporated Tribe)

RESOLUTION OF THE OGLALA SIOUX TRIBAL COUNCIL TO APPROVE THE OGLALA SIOUX TRIBE LONG-RANGE TRANSPORTATION PLAN DATED OCTOBER 2018, PROJECT NUMBER 10617107.

WHEREAS, the Oglala Sioux Tribe adopted its Constitution and By-Laws by referendum vote on December 14, 1935, in accordance with Section 16 of the Indian Reorganization Act of 1934 (25 USC § 5123), and under Article III of the Constitution, the Oglala Sioux Tribal Council is the governing body of the Oglala Sioux Tribe, and

WHEREAS, the Tribal Constitution authorizes the Tribal Council, in Article IV, Section 1(f) to manage all economic affairs and enterprises of the Tribe and in Section 1 (w) to protect and promote the health and general welfare of the Tribe and its members, and

WHEREAS, the Oglala Sioux Tribe recognizes the importance of a well maintained and continuously improved public transportation system on the Pine Ridge Indian Reservation, for the health, safety, prosperity and economic development opportunities for the Oglala Sioux Tribe and its members and for every community on the Reservation, and

WHEREAS, the Oglala Sioux Tribe realizes that 25 CFR 170 describes the National Tribal Transportation Field Inventory as a comprehensive database of all transportation facilities eligible for Tribal Transportation Program funding, and

WHEREAS, the Economic and Business Development Committee of the Tribal Council met on the 19th day of October 2018, and voted to approve the Field Inventory Updates and Long-Range Transportation Plan and forward it to the Tribal Council for final approval, and

WHEREAS, the Tribal Council has considered the matter and determined that it is in the best interest of the Tribe to approve; now

THEREFORE BE IT RESOLVED, that the Oglala Sioux Tribal Council hereby adopt and approve all of the Oglala Sioux Tribal Transportation Field Inventory Updates to the routes and sections of routes shown and attached as Exhibit A, which by this reference is incorporated herein, and

BE IT FURTHER RESOLVED, that the Oglala Sioux Tribal Council hereby adopts and approves the Long-Range Transportation Plan, attached hereto as Exhibit B which by reference is incorporated herein, and said Long Range Transportation Plan includes all Tribal Transportation updates undertaken pursuant to 25 CFR 170 as referenced

in Exhibits A and B.

C-E-R-T-I-F-I-C-A-T-I-O-N

I, as the undersigned Secretary of the Oglala Sioux Tribal Council, of the Oglala Sioux Tribe hereby certify that this Resolution was adopted by a vote of: 17 For; 0 Against; 0 Abstain; and 0 Not Voting; during a REGULAR SESSION held on the 31ST day of OCTOBER, 2018.

DONNA M. SALOMON
Secretary
Oglala Sioux Tribe

A-T-T-E-S-T:

TROY S. WESTON
President
Oglala Sioux Tribe

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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
NTTFI – National Tribal Transportation Facility Inventory
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 - RECOGNIZED ACCOMPLISHMENTS

This Plan would be remiss if it did not recognize the significant progress the Oglala Sioux Tribe (OST) has made in upgrading their transportation system since the 2007 and 2012 LRTP's were completed.

The Oglala Sioux Tribe Department of Transportation (OSTDOT) has successfully applied for and obtained nearly **$22 million** in grant funding for the road system and nearly **$3 million** in grant funding for the airport since beginning their management of the transportation system for the Pine Ridge Indian Reservation in 2002. The following sections list many of the most significant project achievements that have been completed by the OSTDOT and their consultant since 2002.

RECURRENT PROJECT ACHIEVEMENTS

The OSTDOT is continually completing recurrent projects necessary to keep the transportation system maintained and to fulfill Federal requirements, and to position the OST for funding opportunities. These efforts are summarized as follows:

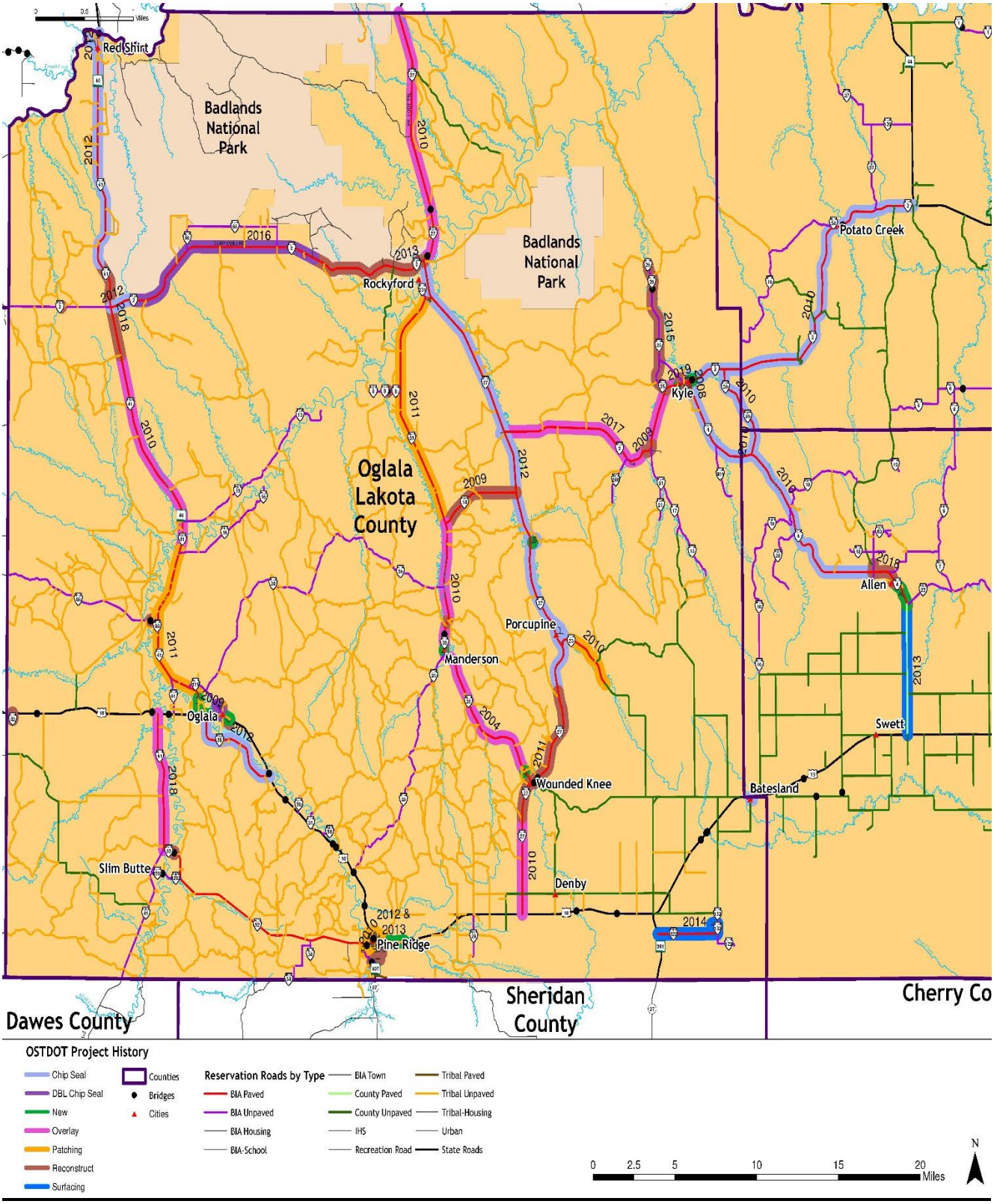
- **Bridge Inspections** – BIA bridges within the Pine Ridge Indian Reservation are inspected every 2 years by KLJ and findings are reported to OSTDOT, FHWA and the BIA. Bridge inspections are required by the BIA and FHWA. Maintenance of bridges is completed periodically depending on available funding.
- **Multi-Route Pavement Striping** – Paved roads throughout the Reservation are striped every two years.
- **Multi-Route Chip Seal** – To preserve existing paved roads throughout the Reservation, asphalt pavements on BIA roads are crack sealed and chip sealed every 7-10 years. With approximately 240 miles asphalt pavement to preserve, projects are split into regions and completed every few years.
- **Road Inventory –**OSTDOT personnel and KLJ have mapped nearly 2,650 miles of roads within the Reservation and updated the BIA's Road Inventory Field Data System (RIFDS). Roads were inventoried and submitted to the BIA for addition to the Road Inventory Field Data System thereby increasing the Tribal Transportation Program funds received for future years. Projects planned for improvements must be included in RIFDS for use of Tribal Transportation Program Funds. As projects are completed, roads are updated in RIFDS.

- **Long Range Transportation Plan (LRTP)** – As a requirement of the Federal Highway Administration, the LRTP must be completed and/or updated every 5 years. The LRTP which identifies needs and goals was completed in 2007, 2012 and is currently being updated.
- **Pavement Management Plan –** The OSTDOT and their engineering firm assessed the existing paved road conditions in 2009 through borings and Falling Weight Deflectometer testing and developed a pavement management plan. The 2009 plan was used to prioritize roadway improvement projects. The paved roads were visually reassessed in 2017 through the Pavement Surface Evaluation and Rating (PASER) method. The results of the PASER study were included in the 2018 LRTP. Because of the study, a pavement preservation plan has been developed within the LRTP.
- **Tribal Transportation Safety Plan (TTSP) –** Tribal Transportation Safety Funds ($12,500) were received by FHWA in 2014 to develop a TTSP. The plan was completed in 2016 and amended in 2018. The TTSP provides an in-depth analysis of crash data and trends; identifies specific safety issues that are causing crashes, increasing crash severity, creating transportation safety concerns in the local communities, or restricting complete data analysis; and provides strategies and recommendations to improve education, enforcement/EMS, engineering, and safety planning/provisions to address safety needs within the Reservation. The TTSP is required to receive FHWA Tribal Transportation Safety grant funds for projects and is a useful tool in applying for other grants. The TTSP will be updated on a regular basis as funding is made available.
- **Routine Gravel Road Maintenance** – Every year, the OSTDOT provides maintenance on their gravel road system as funding and priorities allow. For example, key roads receiving upgrades during 2018 included BIA 16 and BIA 88. Additionally, OSTDOT provides substantial support to address road maintenance needs raised by Tribal Officials and residents. Over 1/3 of their maintenance budget is spent every year on snow removal.

SUMMARY OF ROAD PROJECT ACHIEVEMENTS

The following significant projects have been completed by the OSTDOT since they overtook management of Reservation roads in 2002. While these projects represent the most significant projects completed, the OST has been very active in upgrading and maintaining many of the gravel and dirt roads on the OST road system. Significant projects are listed in order from most recent to the beginning of OSTDOT's management activities. These projects are shown in Figure 1-1 and in the bullets that follow:

FIGURE 1-1 – OST Road Project Achievements



- **Kyle Pathway Project – 0.9 mile –** OSTDOT applied for and received $400,000 in Transportation Alternatives Grant funding through the South Dakota Department of Transportation to construct a continuous 10-foot-wide pathway from the Kyle Hospital Housing Street to Kyle Grocery parallel to BIA 2 edge of right-of-way. The pathway will be separated from the BIA Route 2 roadway and have ADA ramps at street crossings. The project costs will be supplemented with Tribal Transportation Programs funds as the grant will only cover a portion of the project. The project is planned for completion in 2019.
- **Gravel Pit Exploration Project** – The OSTDOT applied for and received $114,000 from the BIA's Division of Energy and Mineral Development to study and determine the best potential gravel pit sites within the Pine Ridge Indian Reservation. The gravel pits would be used to supply gravel to housing sites and for improvements to gravel roads. OSTDOT's engineering firm has completed the Phase 1 part of the study and Phase 2 should be completed early 2019.
- **Oglala Housing Streets** – OSTDOT's engineering firm, KLJ, has preliminary design completed for Oglala Housing and is coordinating design with IHS for the waterline relocation project. After waterlines are installed the Oglala Housing project will be bid for construction. The street design includes curb and gutter, storm sewer and a graded channel to remove storm water from the housing development. The project is planned for completion in 2019.
- **BIA 88 – Bridge A154 –** The existing bridge located approximately 5 miles north of Loneman and 0.6 mile west of BIA Route 41 on BIA Route 88 over the White River is a single lane, multi-span concrete and steel bridge with failed bridge railings. The OSTDOT successfully applied for and received bridge funding to complete the engineering design, survey, environmental investigations and clearances, and acquire right-of-way and temporary construction easements. The project is currently in the design phase and planned for design completion in 2019. Once planning activities are completed, a request for Tribal Transportation Bridge Funding will be made for the removal of the existing bridge and construction of a new bridge.
- **BIA 90 – Bridge A155 –** The existing bridge located approximately 1 mile south of Pine Ridge and 0.2 mile west of SD Hwy 407 on BIA Route 90 over White Clay Creek is a single lane, single-span timber bridge with no bridge railings. The OSTDOT successfully applied for and received bridge funding to complete the engineering design, survey, environmental investigations and clearances, and acquire right-of-way and temporary construction easements. The project is currently in the design phase and planned for design completion in 2019. Once planning activities are completed, a request for Tribal Transportation Bridge

Funding will be made for the removal of the existing bridge and construction of a new reinforced concrete box culvert.

- **BIA 49 – Bridge A133 –** The existing bridge located approximately 0.6 mile south of Wounded Knee and 0.1 mile south of BIA Route 27 on BIA Route 49 over an unnamed tributary to Wounded Knee Creek is a single lane, single-span timber bridge with broken bridge railings. The OSTDOT successfully applied for and received bridge funding to complete the engineering design, survey, environmental investigations and clearances. The project's Plans, Specifications and Engineers Estimate have been completed and a request for bridge construction funds has been made to the Federal Highway Administration, Tribal Transportation Bridge Program.
- **BIA 26 Project –** Reconstruction and realignment of 0.25 miles of BIA 26 in Kyle, SD. This project was completed in 2018 by the Oglala Lakota College to reduce dust and move the roadway away from the Head Start building. The roadway was realigned to create a safer intersection with BIA Route 2, paved for 0.25 mile and graded to allow proper roadway drainage. The project also included a new approach to the Oglala Lakota College Center and reconstruction/realignment of Kyle Dam Road. The Department of Transportation provided initial conceptual layouts and requirements for the road project as well as oversight to ensure a successful project. The Department will complete the northern 0.1 mile by acquiring right-of-way, installing a culvert, and filling in the existing drainage area.
- **BIA 41 – Reconstruction and Spot Leveling –**4.8 miles of heaving pavement was removed and reconstructed from 2.4 miles north to 2.4 miles south of BIA Route 2. The existing road had severe heaving due to very poor subgrade soils. The pavement design incorporated asphalt concrete pavement over base course, triaxial geogrid, subbase and separation fabric over subgrade scarified and recompacted. The project was designed by KLJ with geotechnical engineering assistance from American Engineering Testing. Construction observation and quality assurance testing of materials was performed by KLJ with oversight by OSTDOT. The project was completed in 2018.
- **BIA 41 Overlay – BIA 32 North to US Hwy 18** – The existing double chip sealed surface was patched and topped with 4" of asphalt concrete pavement. Asphalt extended into the approaches to protect the new pavement from vehicle turning movements. Striping and rumble strips were installed, and the disturbed side slopes reseeded. Construction observation and quality assurance testing of materials was performed by KLJ with oversight by OSTDOT. The project was completed in 2018.

- **BIA 2 Overlay – Sharps to Kyle** – The existing asphalt was milled, and excess millings placed on the shoulder. The roadway top was leveled with asphalt where needed and topped with 2" of asphalt concrete pavement. Asphalt extended into the approaches to protect the new pavement from vehicle turning movements. Striping and rumble strips were installed, and the disturbed ditches reseeded. Construction observation and quality assurance testing of materials was performed by KLJ with oversight by OSTDOT. The project construction began in 2017 and was completed in 2018.
- **Pass Creek Community Road Safety Reconstruction, Allen Road – BIA 4 Extension –** The OSTDOT successfully applied for and received $2,312,191 through Public Lands Highway Discretionary Funds. This project realigned 3 miles of BIA 4 through the Allen Community and connecting to the previously paved 6-miles of Allen Road to remove sharp curves, widen the roadway, incorporate a walk/bike trail, coordinate utility relocations, perform environmental investigations and submit environmental clearance applications. Additionally, the project acquired new right-of-way and temporary construction easements. OSTDOT personnel and Tribal Council District representatives worked closely with their engineering firm, KLJ, to review and approve the new roadway and pathway alignment, hold public meetings, and conduct construction progress meetings. KLJ performed the surveying and design engineering services to prepare construction plans for bidding and assisted the OSTDOT in right-of-way acquisition and environmental clearances. The project was constructed in 2017-2018. Construction observation and quality assurance testing of materials was performed by KLJ with oversight by OSTDOT. The project construction began in 2017 and was completed in 2018.
- **BIA 32 – Culvert Repairs –** The OSTDOT construction crew is currently working on repairs to substandard and failing culverts under BIA Route 32. The project is planned for completion in 2019.
- **Emergency Relief for Federally Owned Roads Projects –** In May 2015, stormwater from heavy wet snow fall and excessive rainfall caused extensive damage to three culverts along BIA Route 27 north of BIA Route 2, road and culvert failure on BIA 2 near the west Reservation line, and damage to the road pavement, shoulder and side slopes of BIA Route 41 north of the White River bridge. Applications for emergency relief funding were submitted to and approved by Federal Lands Highway. The OSTDOT construction crew has completed most repairs to these roads and culverts due to the storm and should be completed in 2018.

- **BIA Route 2, Cuny Table Road – 17.6 miles** – The OSTDOT applied for and received USDOT TIGER V Grant funding for $8,777,960. This national transportation grant is highly competitive and only 3-5% of the funding applied for by States, MPO's, Counties, and Tribes was awarded. The project reconstructed and paved 17.6 miles between previously paved road sections near BIA 27 and BIA 41. OSTDOT's engineering firm, KLJ, assisted in preparing the grant application, providing supplemental surveying (survey was obtained from the BIA), performed the design engineering, environmental investigations and clearance applications, temporary construction easement acquisition assistance, and construction staking. Construction observation and quality assurance testing of materials was performed by KLJ with oversight by OSTDOT. The project was completed in 2016.
- **BIA 25 – Kyle North –** Reconstruction of 6.7 miles of BIA 25 to widen, realign, replace culverts, and install gravel surfacing. Construction observation and quality assurance testing of materials was performed by KLJ with oversight by OSTDOT. The project was completed in 2015.
- **BIA 46 – Kyle Post Office Street** – Minor reconstruction of the BIA 2 and post office street intersection to improve drainage was completed along with the BIA 25 project. The project was completed in 2015.
- **OSTDOT Office Building** – Design, bidding administration and construction observation of a new office building. Design also included environmental clearances. The project was completed in 2014.
- **BIA Route 27 Safety Upgrades at Wounded Knee** – OSTDOT applied for and received $109,500 in Tribal Transportation Safety funds for installation of pedestrian crossings with warning beacons, additional striping and signage, and rumble strips to calm traffic and warn of pedestrian crossings. The project was completed in 2014.
- **Cheyenne River Bridge** – The OSTDOT applied for and received "Bridge Funds" from the Federal Highway Administration for this County owned bridge. Even though it is a County owned bridge, it is used by many Tribal Members and is considered an access road.
- **Wakpamni Housing Chip Seal** – The project was designed and let for bidding in 2013. The roadway surface prepared, asphalt concrete surfacing installed along with a storm sewer inlet in the housing area and striping for the whole project. The project was completed in 2014.

- **Allen Road – US Hwy 18 to 6 miles north –** Bennett County reconstructed the 6-mile roadway in 2010 to a wider gravel surfaced roadway. The OSTDOT, through funding from the Tribe, coordinated the engineering design and construction to install asphalt concrete paving, rumble strips and striping from BIA Route 22 to US Hwy 18. Construction observation and quality assurance testing of materials was performed by KLJ with oversight by OSTDOT. The project was completed in 2013.
- **SuAnne Big Crow Trail and Lighting** – 1.5 miles of 10'-wide pedestrian trail from Pine Ridge to SuAnne Big Crow Boys and Girls Youth Complex. The pathway was design by KLJ and constructed by the OSTDOT construction crew and completed in 2012. In 2013 a pathway lighting project was completed in conjunction with SuAnne Big Crow Trail.
- **Oglala-Loneman Trail and Lighting** – A 10'-wide pedestrian trail from Oglala to Loneman School was constructed through a contract with the SDDOT. In 2013 a pathway lighting project was completed in conjunction with Oglala-Loneman Trail.
- **BIA 32 Slim Buttes – Culvert replacement on the White River** –Due to excessive rainfall and high water in the White River, the metal culvert failed causing the road to cave in. OSTDOT applied for and received high priority emergency funds to replace the culvert. Funding was supplemented with Tribal Transportation Program funds to engineer design a new larger reinforced concrete box culvert and road repair. The OSTDOT construction crew performed the construction work to replace the box culvert and repair the road with the assistance of their engineering firm for construction staking. The project was completed in 2013.
- **BIA 2, Cuny Table Road** – OSTDOT applied for and received $1,900,000 in Public Lands Highway Discretionary (PLHD) grant funds to reconstruct 2 miles of BIA Route 2 from BIA Route 27 to the west. The project provides paved access to the Badlands National Park's White River Visitor Center. The OSTDOT coordinated the engineering design through construction of the project that provided 2 miles of asphalt paved highway with striping, rumble strips, and signage. The project also included replacement of deteriorated metal culverts with reinforced concrete culverts and upgrades to the White River bridge railing and guardrail. The project was completed in 2013.
- **BIA Routes 115 and 41** – Road surface preparation, double chip seal, striping and signage for 7.5 miles. The project was completed in 2012.

- **BIA 36 Tribal Office Street** – The Tribal Office Street from US Hwy 18 to BIA 32 in front of the Tribal Office Building was reconstructed to provide curb and gutter, asphalt concrete paving, additional parking, ADA accessible ramps and parking spaces, a pedestrian crossing, landscaping, improved street lighting, and storm sewer. Engineering design, construction observation and quality assurance testing of materials was performed by KLJ with oversight by OSTDOT. The project was completed in 2012.
- **BIA 27 - Wounded Knee to Porcupine Butte** – OSTDOT worked with the BIA to acquire engineering design plans and funding to realign and reconstruct 7.3 miles of BIA Route 27. The project included removing sharp curves, widening the roadway surface, adding shoulders, asphalt concrete paving, culvert replacement, striping and signage. The project also included improvements to the visitor parking area at Wounded Knee Massacre and Cemetery Site. BIA design review, right-of-way acquisition assistance, construction observation, and quality assurance testing of materials was performed by KLJ with oversight by OSTDOT. The project was completed in 2011.
- **BIA 41, Leveling Patches - US Hwy 18 to 10 miles north** – OSTDOT coordinated the engineering design, bidding, and construction observation for asphalt leveling patches. The project was completed in 2011.
- **BIA 33, Asphalt Patching – BIA 27 to BIA 14** – OSTDOT coordinated the engineering design, bidding, and construction observation for asphalt leveling patches. The project was completed in 2011.
- **BIA 41 White River North –** OSTDOT successfully applied for American Recovery and Reinvestment Act of 2009 (ARRA) grant funding. Funds were used to resurface 10.6 miles of BIA Route 41 from 0.6 mile south of the White River bridge to 10 miles north of the bridge. The project milled existing asphalt and installed an asphalt concrete overlay, fixed areas with bad subgrade, installed concrete pavement adjacent to the White River bridge, striping and rumble strips. Engineering design, construction observation, and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2011.
- **Reservation-wide Sign Replacement Project** – OSTDOT successfully applied for American Recovery and Reinvestment Act of 2010 (ARRA) grant funding to replace existing roadway signs throughout the Reservation. The OSTDOT construction crew performed the replacement project. The project was completed in 2011.

- **Bridge Maintenance Project** – OSTDOT successfully applied for American Recovery and Reinvestment Act of 2010 (ARRA) grant funding to rehabilitate and maintain BIA bridges throughout the Reservation. The OSTDOT construction crew performed a portion of the work. The project was completed in 2010.
- **BIA 27 White River Visitor Center to Reservation Line** – OSTDOT successfully applied for American Recovery and Reinvestment Act of 2009 (ARRA) grant funding. Funds were used to resurface 13 miles of BIA Route 27. The project milled existing asphalt and placed on the shoulders, installed a 4-inch asphalt concrete overlay, fixed areas with bad subgrade, repaired culvert, striping and rumble strips. Engineering design, construction observation, and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2010.
- **BIA Route 33 - Manderson to Gooseneck** – OSTDOT coordinated the design through construction to resurface 6.5 miles of BIA Route 33. The existing roadway top was leveled with asphalt where needed and topped with 1.5" of asphalt concrete pavement. Striping, rumble strips, and no passing reference posts were installed. Engineering design, construction observation, and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2010.
- **BIA 27 US Hwy 18 to the North** – OSTDOT coordinated the design through construction to resurface 4.7 miles of BIA Route 27. The project milled existing asphalt and placed on the shoulders, spot repaired some areas, installed a 2-inch asphalt concrete overlay, paved around historic marker, striping, rumble strips, and no passing reference posts. Engineering design, construction observation, and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2010.
- **BIA Route 14 Gooseneck Road** – OSTDOT coordinated the 4.9-mile project from engineering design through construction. The engineering design was completed by KLJ/Dakota Engineering for two phases of construction. The first phase of construction which included grading, drainage, base course, and signage was completed by the OSTDOT construction crew. The second phase of construction was advertised for bids to install asphalt concrete paving, striping and rumble strips. OSTDOT successfully applied for and received PLHD Funds for the asphalt paving portion of the project. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2009.

- **BIA Route 2 - Five Mile Corner** – OSTDOT coordinated the 0.5-mile realignment and reconstruction project from engineering design through construction to change a dangerous T-junction into a curve. The engineering design was completed by KLJ/Dakota Engineering for two phases of construction. The first phase of construction which included grading, drainage, base course, and signage was completed by the OSTDOT construction crew. The second phase of construction was advertised for bids to install asphalt concrete paving, striping and rumble strips. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2009.
- **Kyle Street Reconstruction -** OSTDOT coordinated the 0.7-mile reconstruction project from engineering design through construction to improve White Owl Street. The engineering design was completed by KLJ/Dakota Engineering for two phases of construction. The first phase of construction which included grading, drainage, base course, and signage was completed by the OSTDOT construction crew. The second phase of construction was advertised for bids to install asphalt concrete paving and striping. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2008.
- **Sunrise Housing** – OSTDOT administered the construction of 1.26 miles of street reconstruction for Sunrise Housing. The project was engineer designed by the BIA for street reconstruction, partial curb and gutter and asphalt paving. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2008.
- **Golf Course Housing and Hospital Housing Streets** – OSTDOT administered the construction of 0.9 mile of street reconstruction for the Golf Course Street and entrance, Golf Course access road, and new Hospital Housing streets. The project was engineer designed by the BIA for street reconstruction, curb and gutter and asphalt paving. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2009.
- **Box Culverts on BIA Routes 8, 21 and 33 –** The OSTDOT construction crew installed 3 reinforced box culverts on various BIA routes. Asphalt Concrete was installed on BIA 33. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2007.

- **BIA 41 and 16 –** OSTDOT administered the construction of 10.6 miles of road widening, culvert replacement, and chip seal from BIA 16 to 10 miles north of the White River. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2006.
- **Governor Housing** – OSTDOT administered the construction of Governor Housing street reconstruction, curb and gutter and asphalt paving. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2005.
- **Casino Access Road** – OSTDOT administered the Casino's access road and parking lot reconstruction and asphalt paving. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT. The project was completed in 2005.
- **BIA Route 2 and 41** – OSTDOT administered the 7.1 miles of reconstruction, widening and asphalt paving to realign the intersection of BIA Route 2 and BIA Route 41. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT.
- **BIA Route 28 Manderson to Wounded Knee** – OSTDOT administered the 8.8 miles of widening and asphalt overlay of BIA Route 28. Construction observation and quality assurance testing of materials was performed by KLJ/Dakota Engineering with oversight by OSTDOT.

SUMMARY OF TRANSIT PROJECT ACHIEVEMENTS

- **Oglala Sioux Transit Shelters** – The Oglala Sioux Transit received funding from the Federal Transit Administration to purchase and install transit shelters throughout the Pine Ridge Indian Reservation. OSTDOT's engineering firm, KLJ, provided construction plan drawings and construction staking support for the OSTDOT construction crew to install 6 shelters in the communities of Evergreen, Kyle, Manderson, Martin, Oglala, and Wounded Knee. The project was completed in 2013.
- **Oglala Sioux Transit Building** – OSTDOT and Oglala Sioux Transit administered the design and construction of a transit building and parking lot to house offices, rider waiting area, bus garage and wash, and conference room. The building and site construction was completed in 2009.

SUMMARY OF AIRPORT PROJECT ACHIEVEMENTS

- **Pine Ridge Airport – General Aviation Apron Reconstruction and Expansion –** OSTDOT administered the design, bidding administration and construction observation for the reconstruction and expansion of the General Aviation Apron. The project included placement of a new bituminous section connecting the apron to the existing taxiway and adjusted the lighting system.
- **Pine Ridge Airport – Reconstruct Runway 12-30 –** OSTDOT administered the design, bidding administration and construction observation for the reconstruction and widening of Runway 12-30 to 75 feet, placed a bituminous overlay on the remainder of the pavements to include the connecting taxiway and apron; adjusted the lighting system, relocated the Precision Approach Path Indicators on Runway 30 End and Install Non-Lighted Signs.
- **Pine Ridge Airport – Airport Layout Plan –** OSTDOT administered this project which provides for the updating of the Airport Layout Plan to meet the criteria of the Federal Aviation Administration.
- **Pine Ridge Airport – Runway 12-30 Updates –** OSTDOT administered the project design and construction to replace the Runway 12-30 lighting system, controls and replaced some navigational aids. Specifically, installation of medium intensity runway lighting system, runway 30 precision approach path indicators, rotating beacon, wind cone w/segmented circle & miscellaneous items.
- **Pine Ridge Airport – Snow removal equipment building –** OSTDOT administered the project design and construction of a building to house the snow removal equipment designated for the airport.
- **Pine Ridge Airport Pavement Repairs and Fencing –** OSTDOT administered the project design and construction to install a 10-foot high perimeter security fence around the airport as well as provided miscellaneous pavement repairs to the runway and apron.

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. An Executive Summary of this LRTP is provided in Appendix A. Much information within the LRTP is mapped. Larger scale versions of key maps are provided in Appendix B.

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 170, Tribal Transportation Program; Final Rule (See Excerpt of 25 CFR Part 170 in Appendix C). 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, Vetal, 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

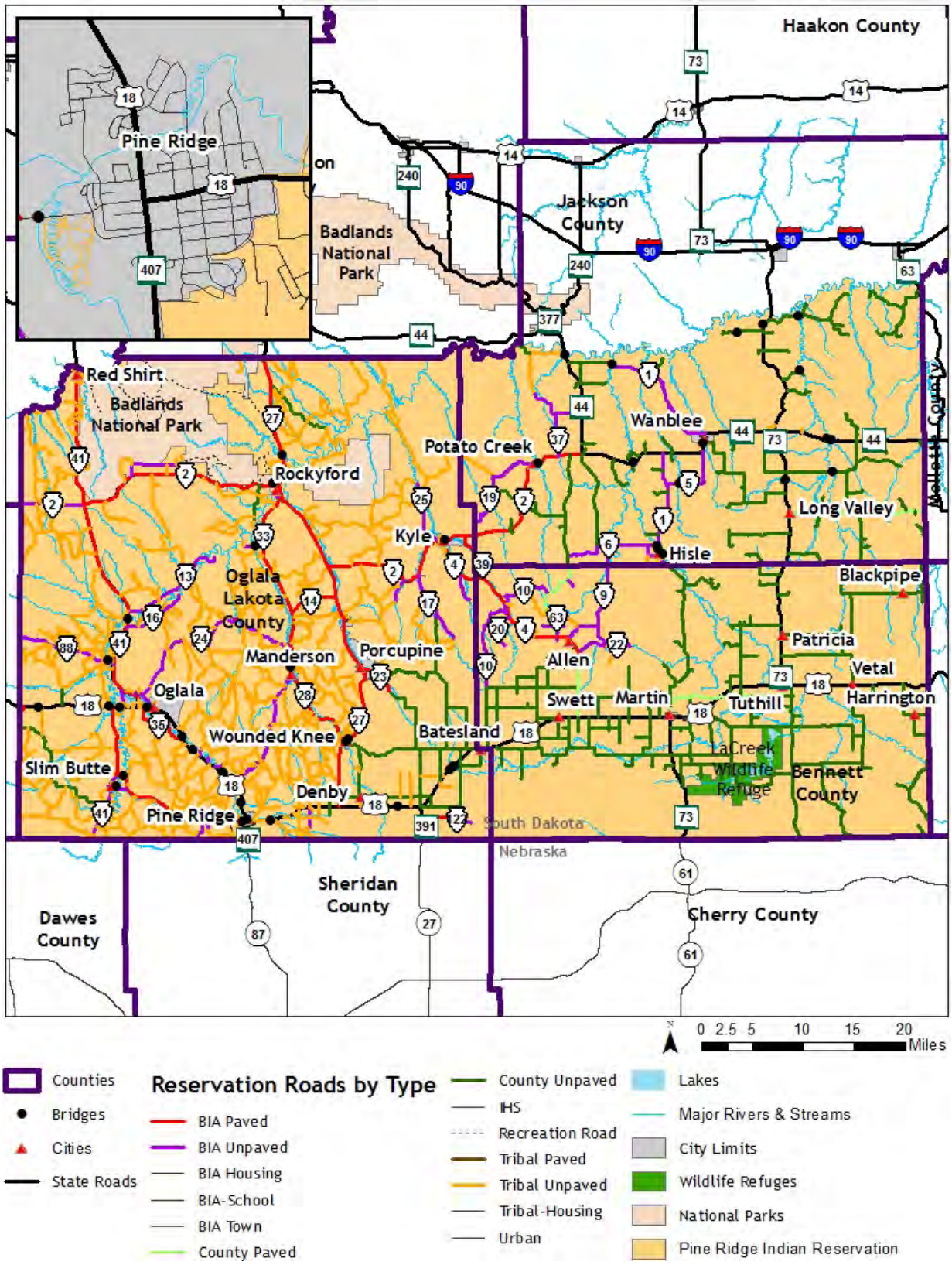


FIGURE 2-2 – Study Area – Allen



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 managed 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.

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 (NTTFI) found in the Road Inventory Field Data System (RIFDS) are shown in Figure 3-1. A summary of roads found in RIFDS, as well as a list of those needing to be updated within the inventory is provided in Appendix E.

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.

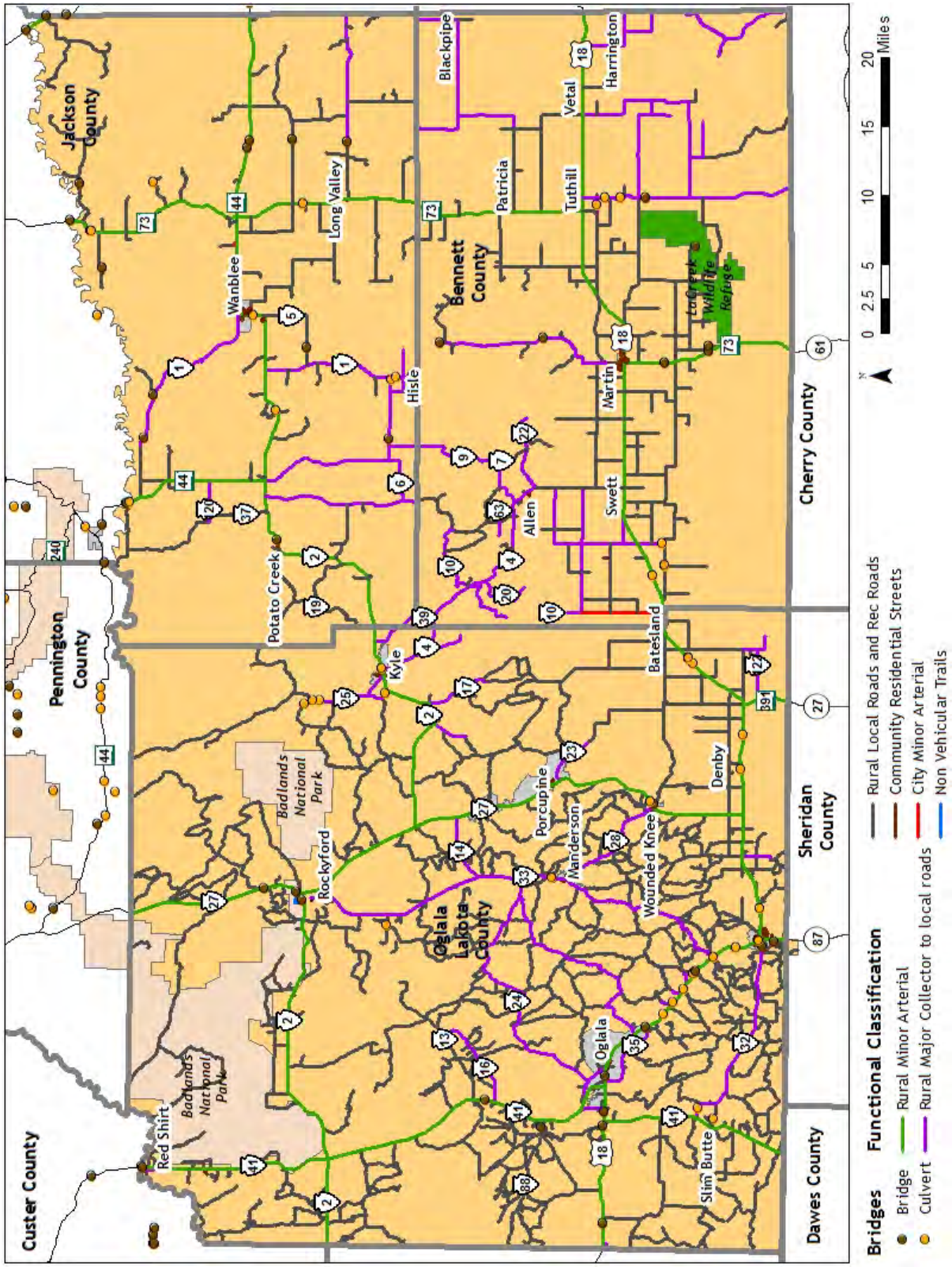
RIFDS INVENTORY ADDITIONS

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

Additional updates to RIFDS are needed. These are shown in Appendix J.

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

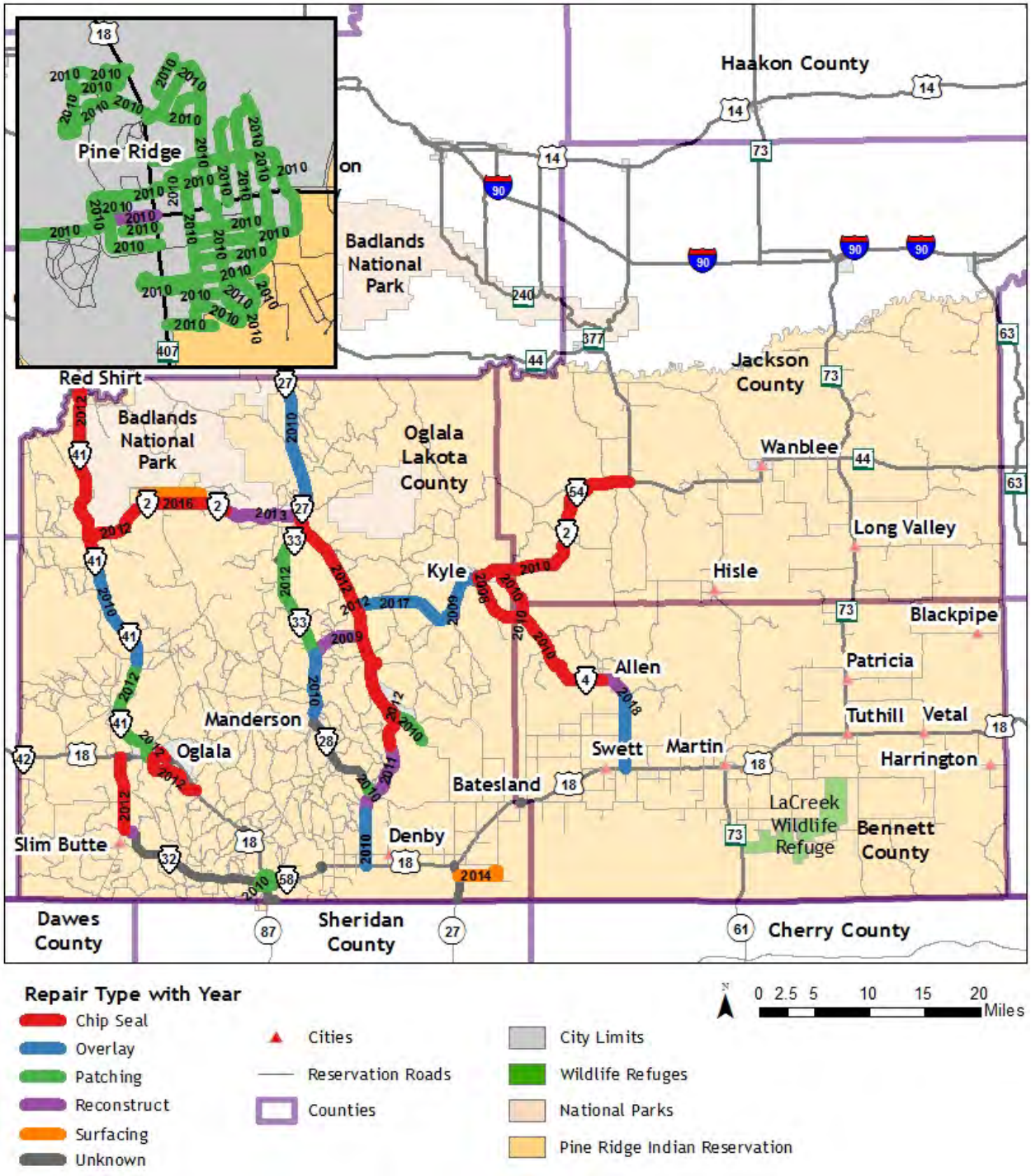
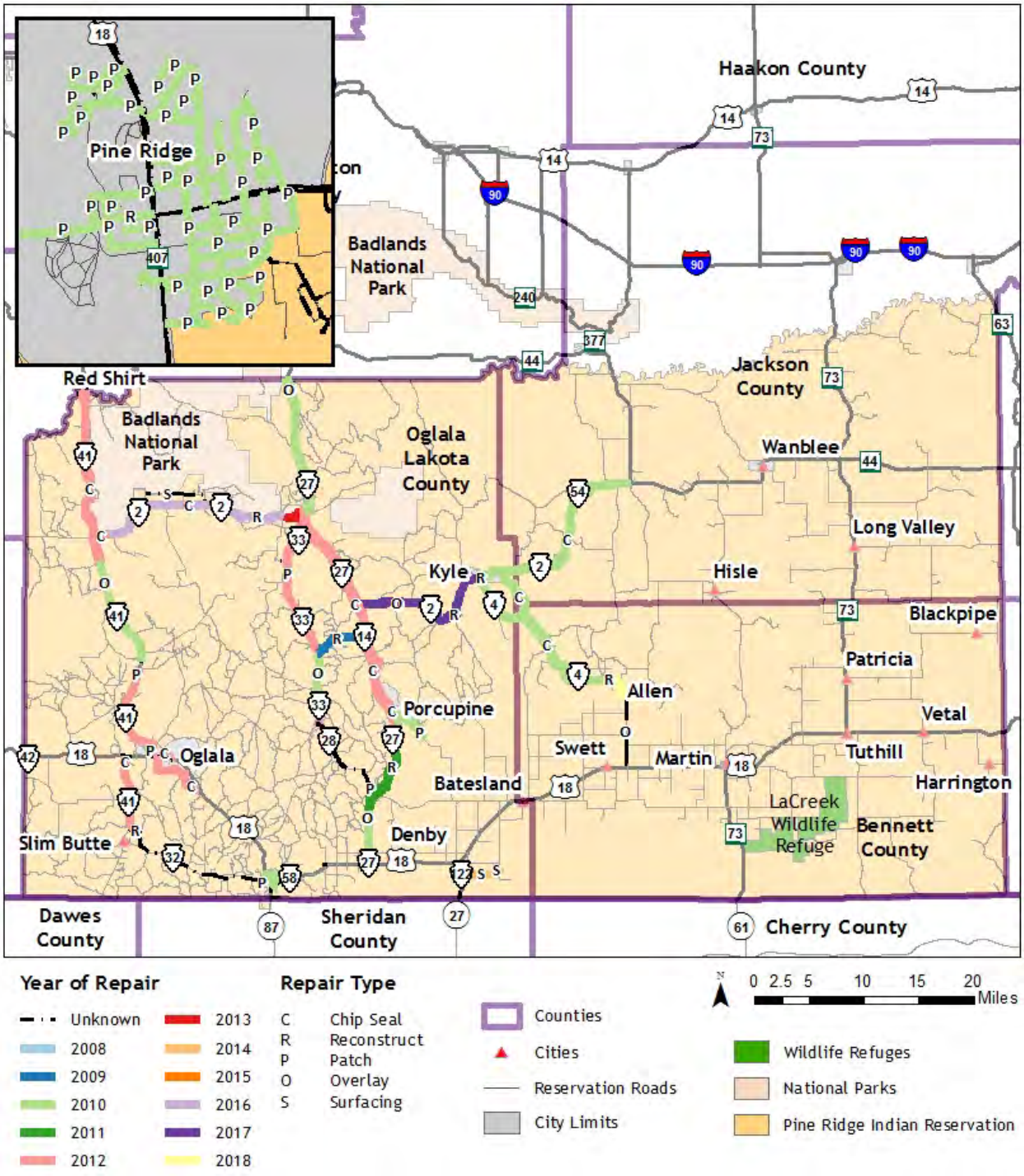


FIGURE 3-7 – Paved Roadway Repair Type by Year



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 no 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

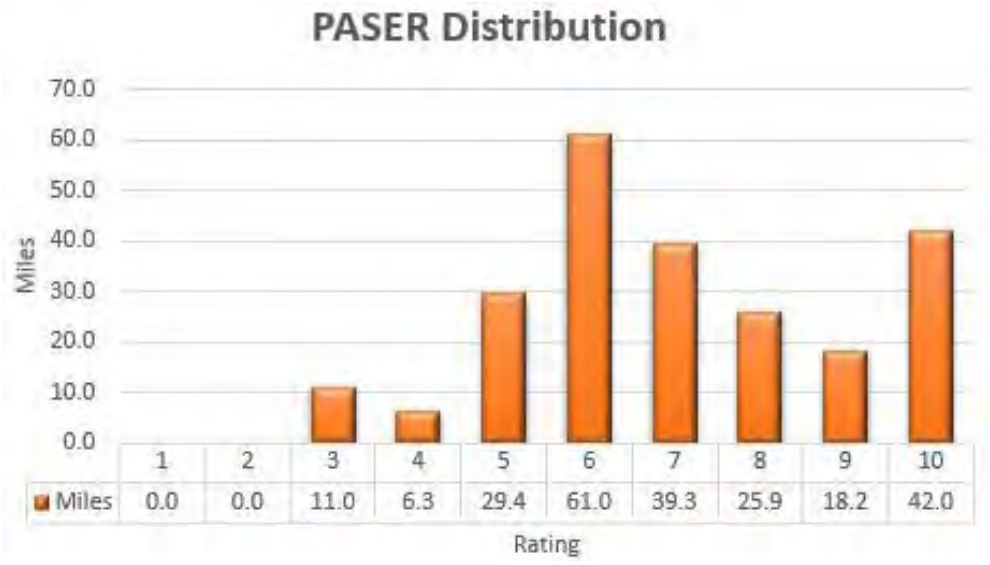
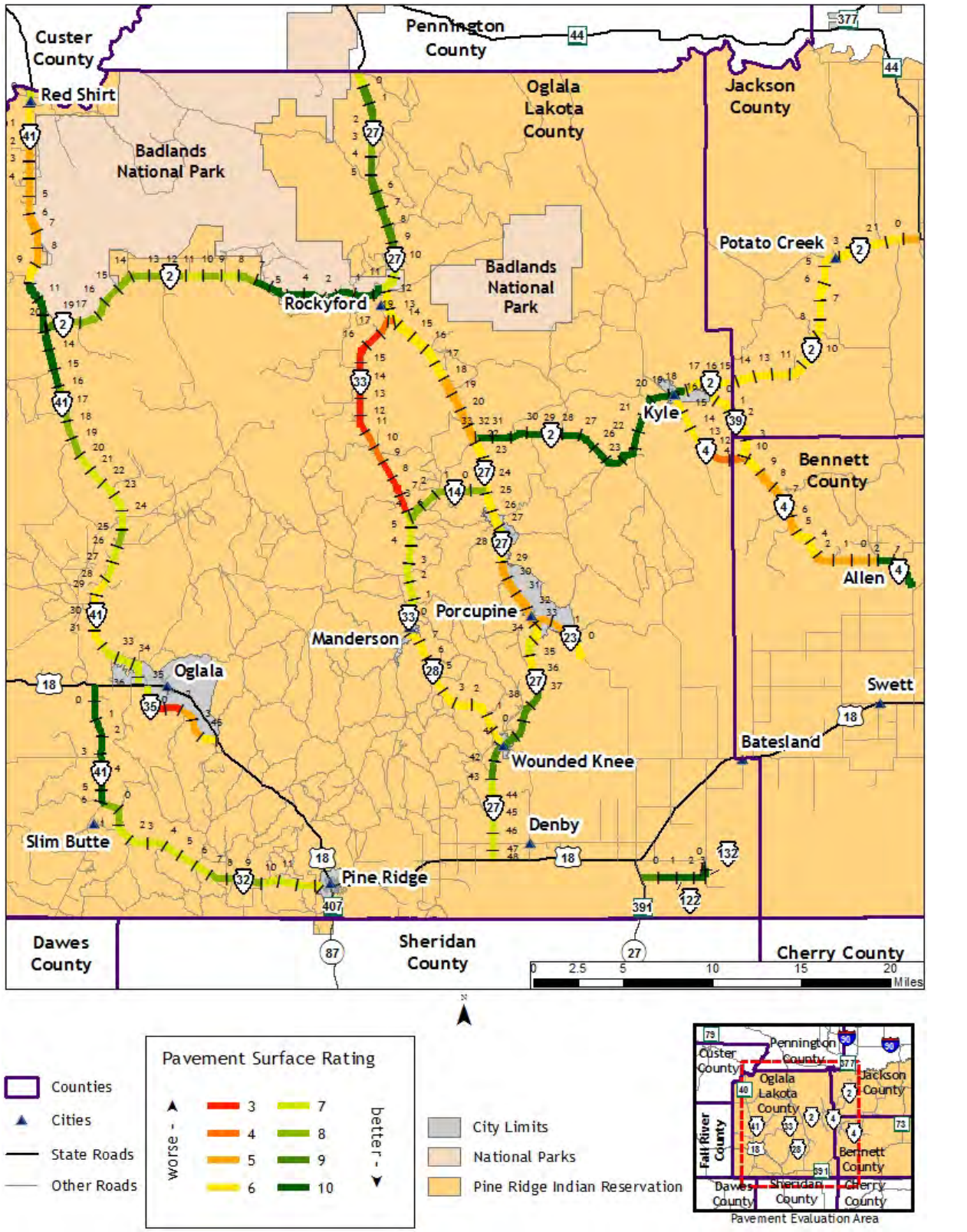


Figure 3-9 shows how each paved road included in the analysis were rated and accounts for improvements that were scheduled to be completed in 2018.

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

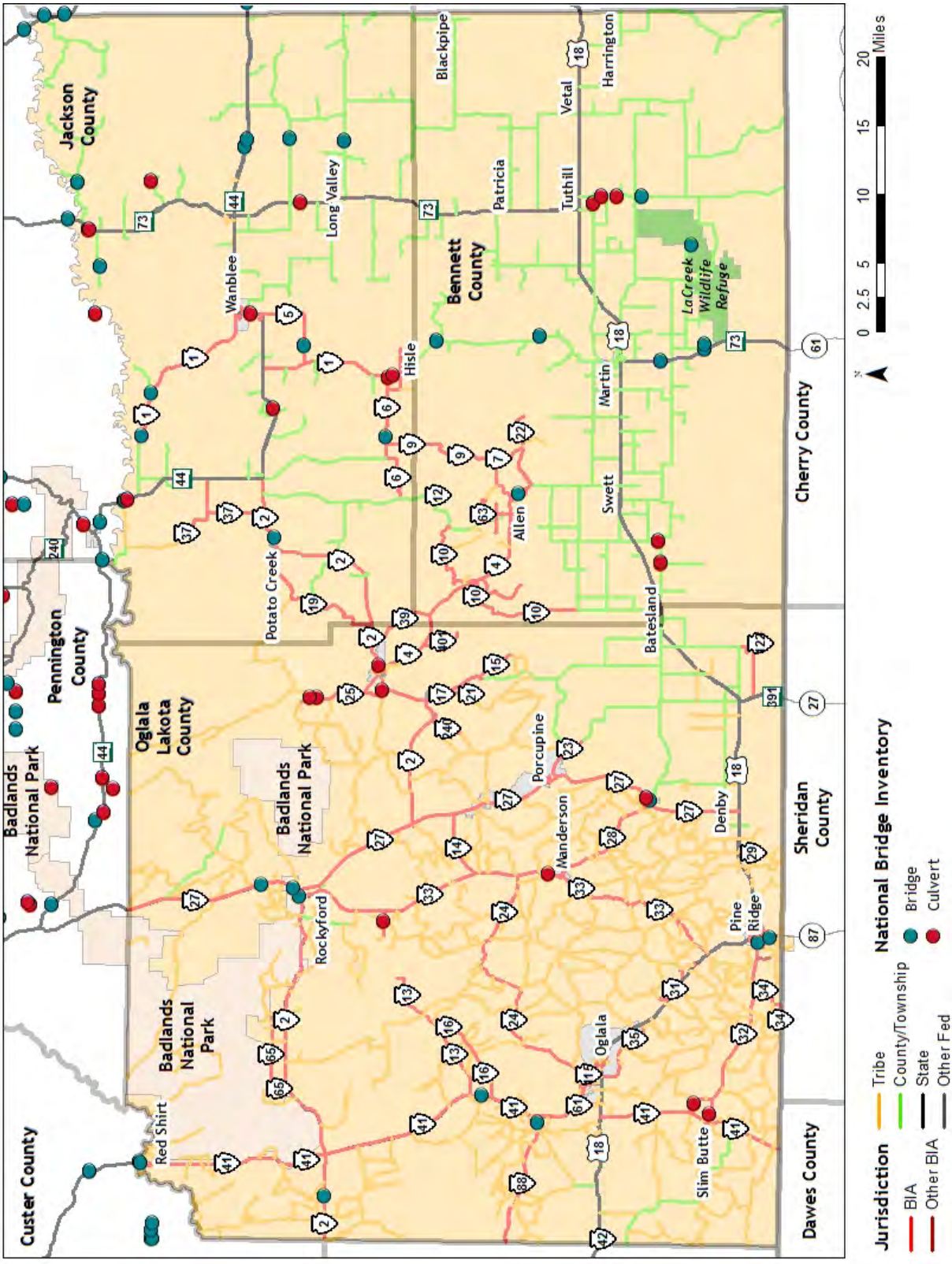


FIGURE 3-12 –2017 National Bridge Inventory - Bridge Conditions

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	3202	10 KM EAST OF SLIM BUTTE	Gravel	Minor	87	N	N	5	6	11/2/2017
A133	ROUTE 27 DRAIN CHANNEL	49	0.2 KM E OF RTE 27&28 JCT	AC Pavement	Pothole	62	6	6	7	N	11/3/2017
A136	WHITE CLAY 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.

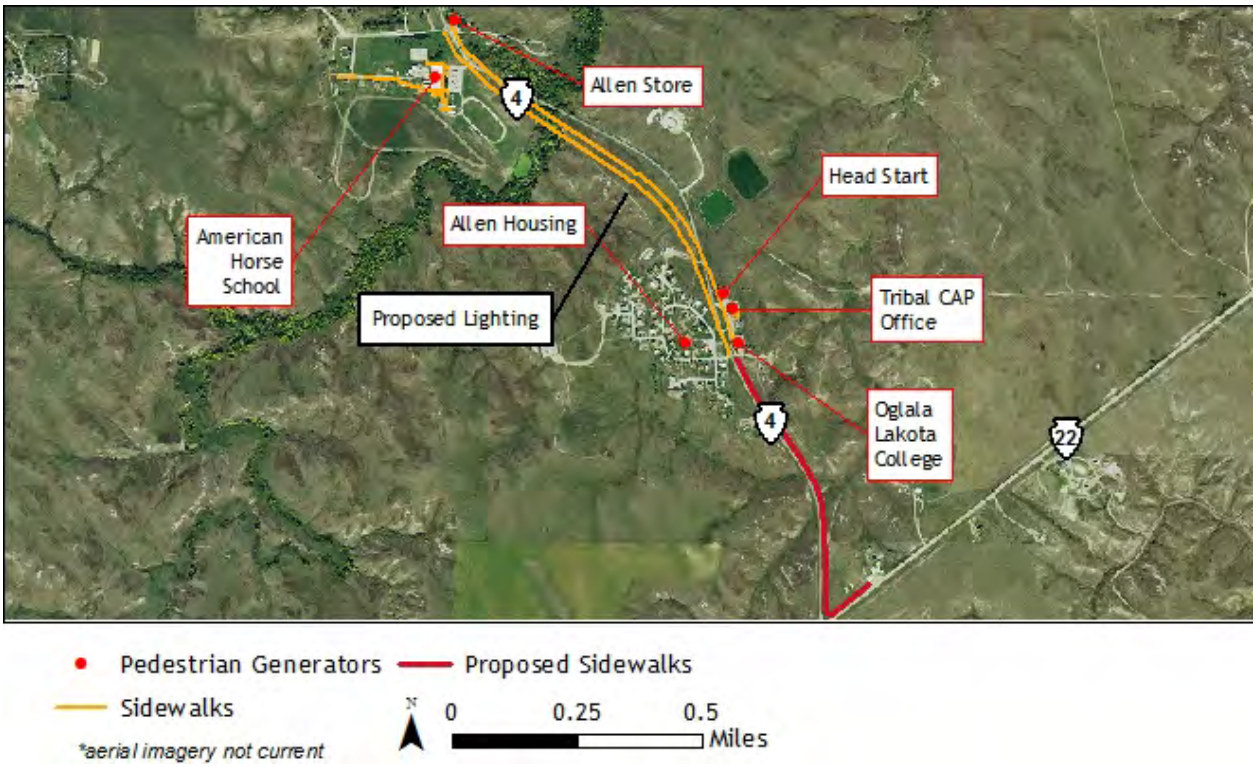
Each town across the Reservation would benefit from installation of sidewalks and/or shared use paths. To provide a list of top priority locations, the following nine towns were evaluated.

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

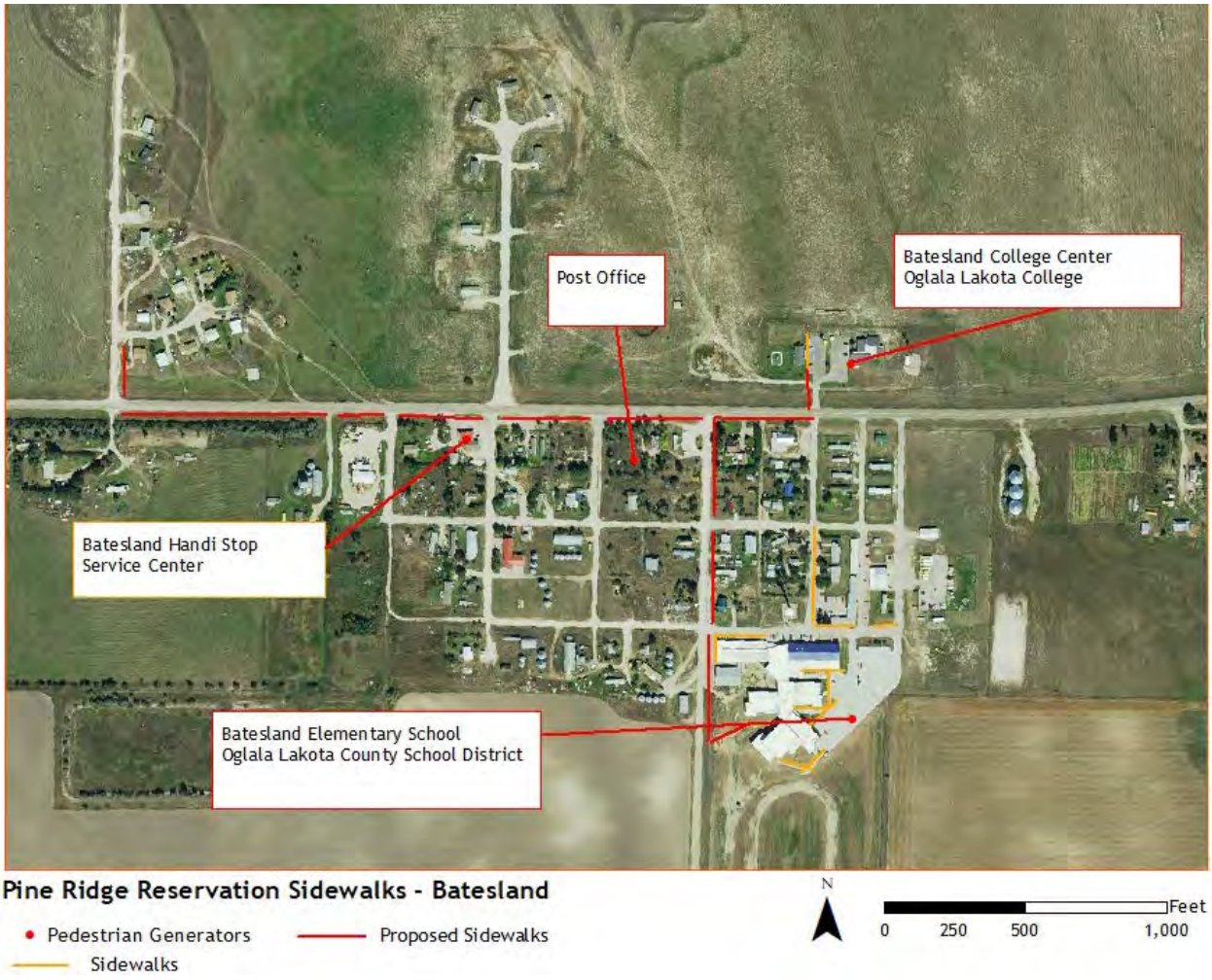


Batesland Sidewalks

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



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.

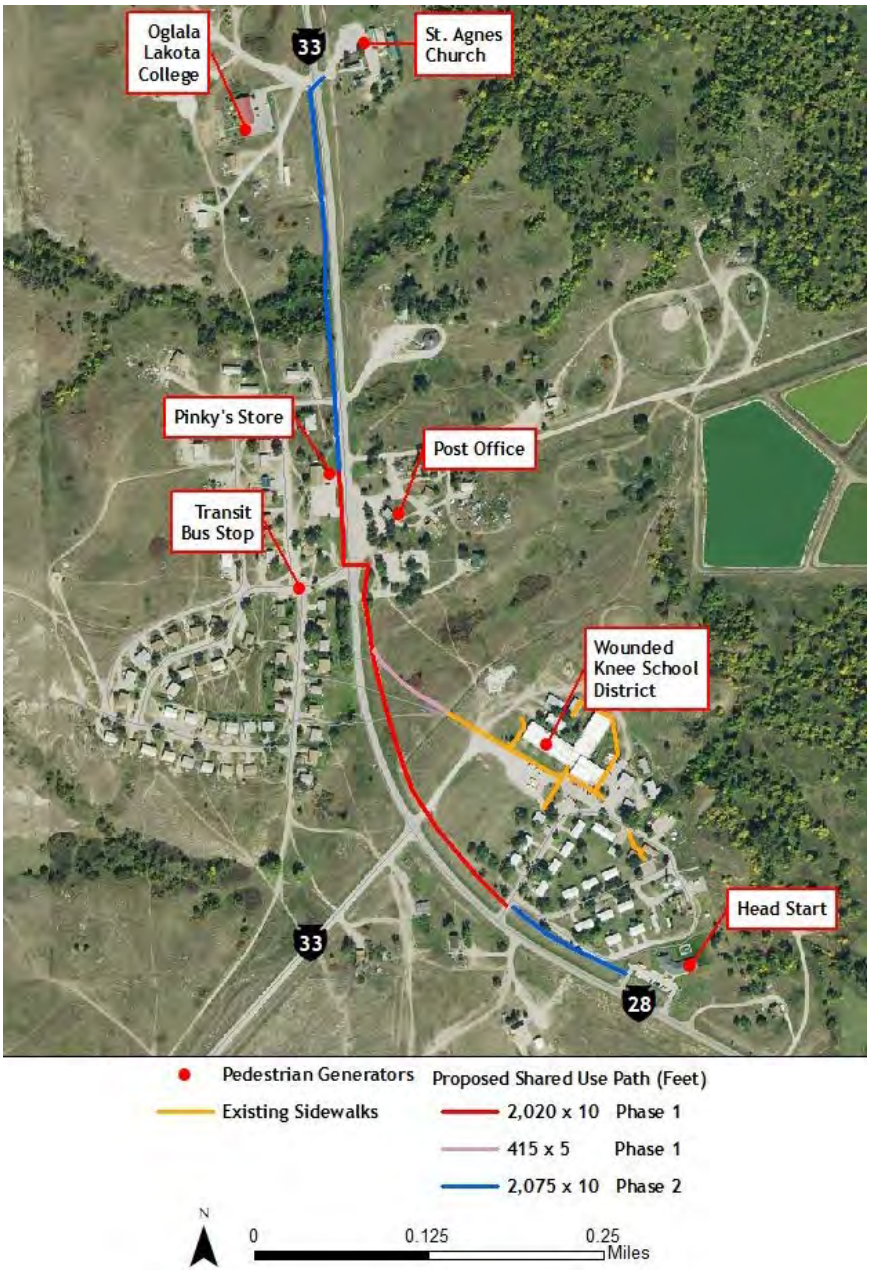
Further sidewalk extensions along BIA 2 and an improved crossing of BIA 2 in front of the Oglala Lakota College and improved intersection with crosswalks at BIA 4 and the Little Wound School were identified as needed improvements. Shared use path upgrades and expansion along the south side of BIA 2 from 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



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.

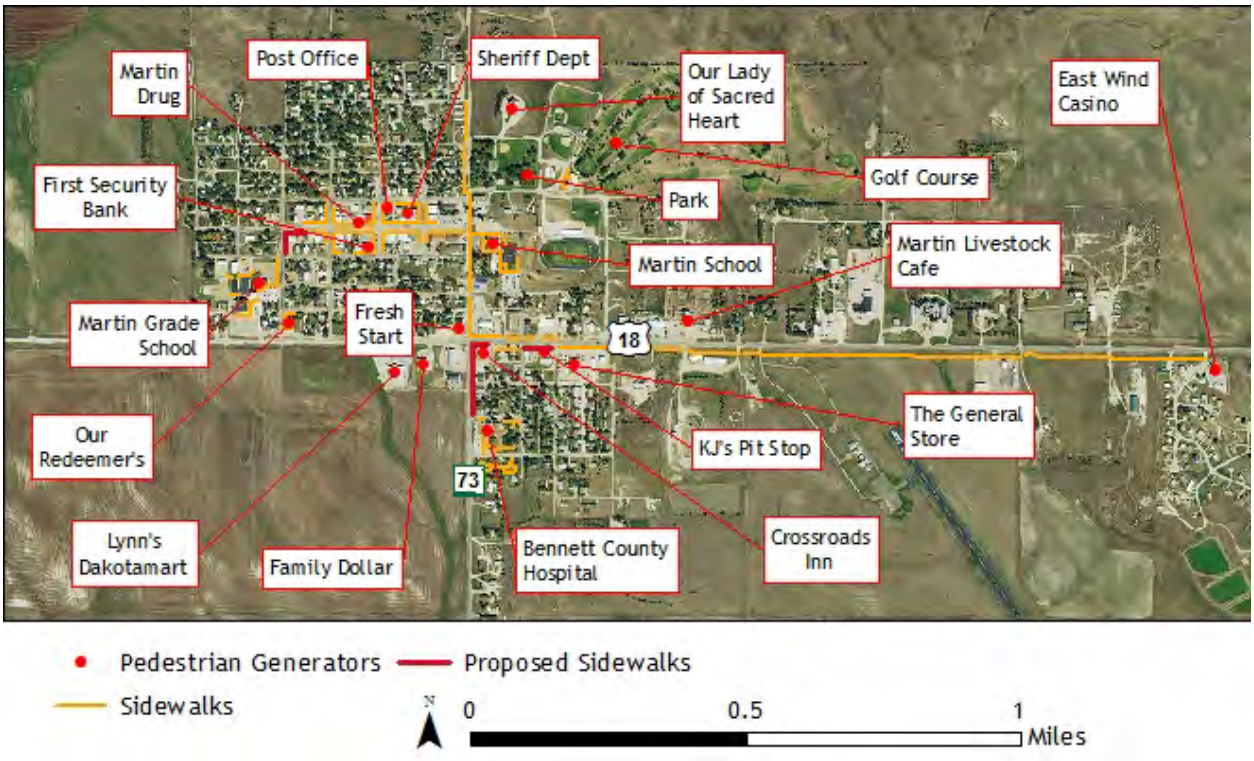
FIGURE 3-16 – Existing and Proposed Sidewalks – Manderson



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.

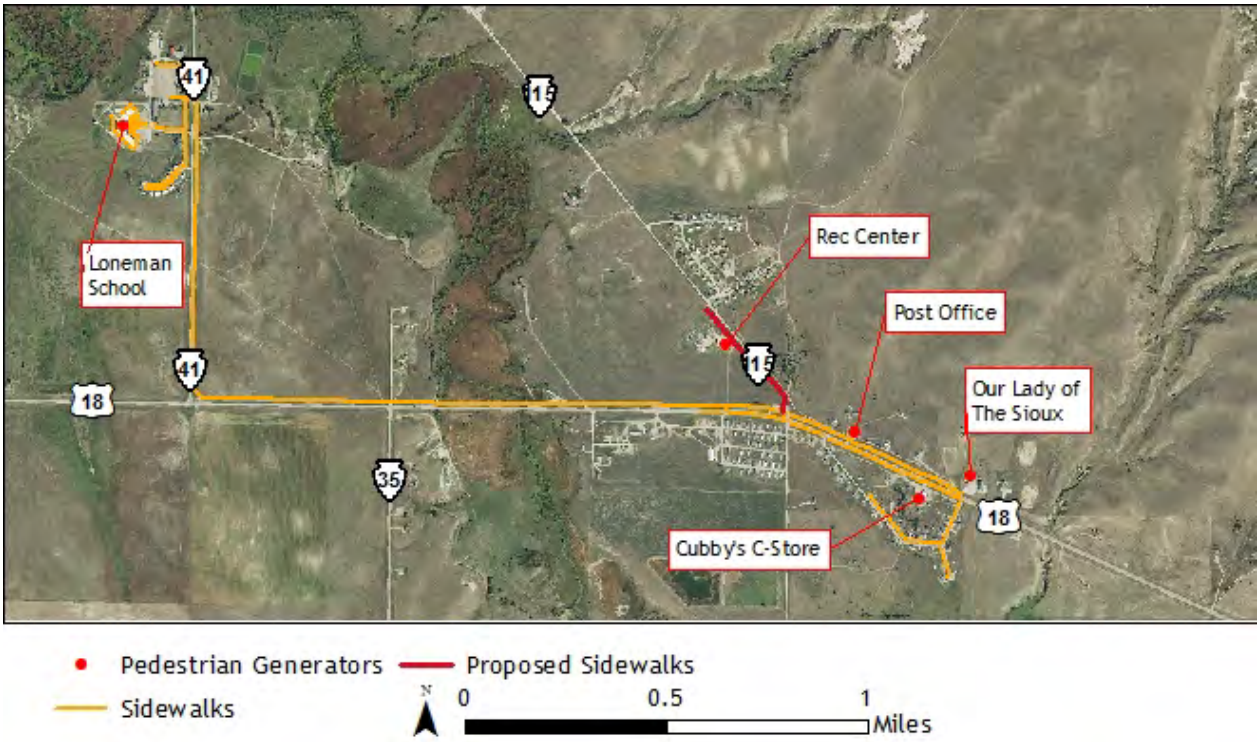
FIGURE 3-17 – Existing and Proposed Sidewalks – Martin



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 - Oglala

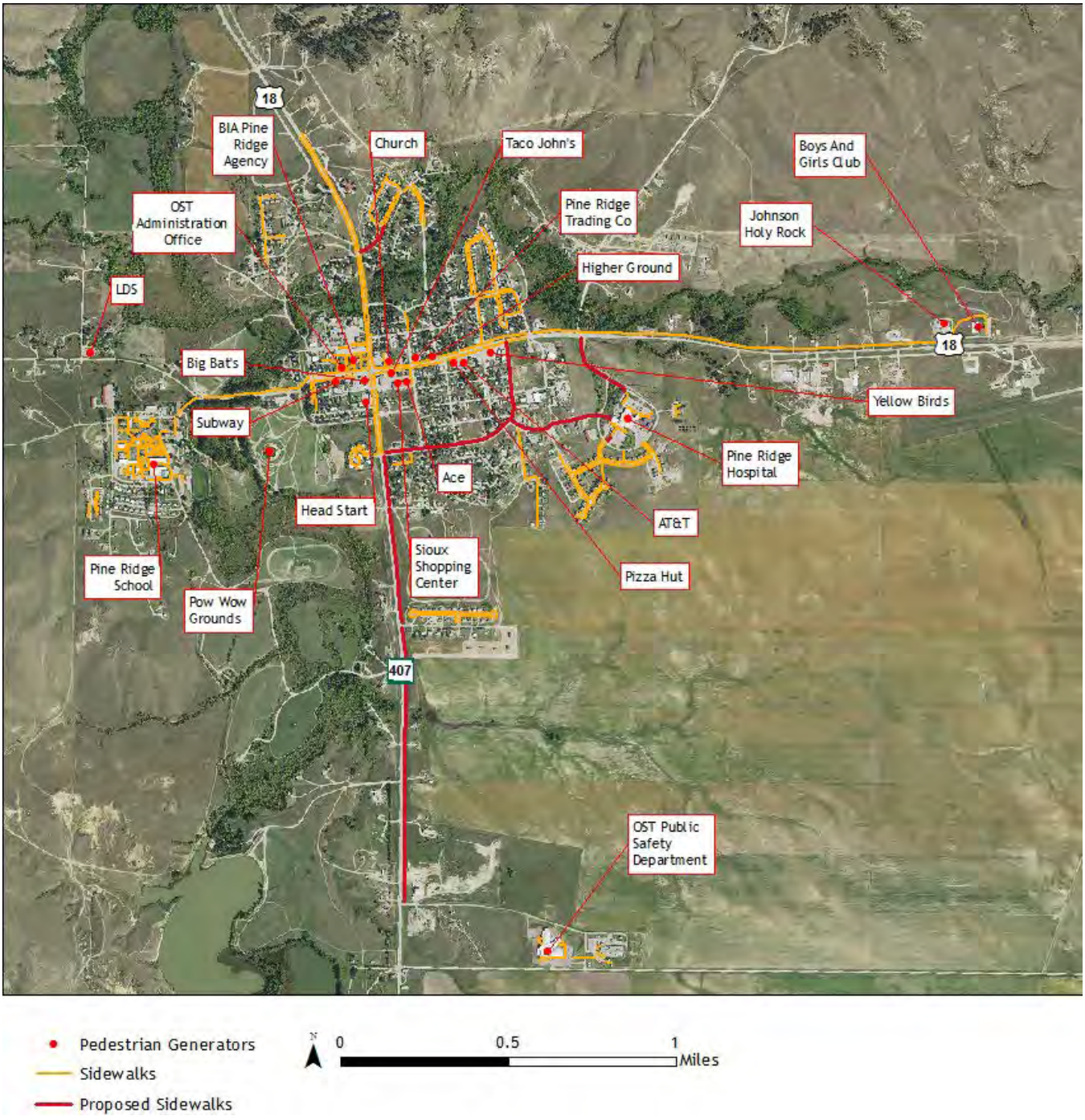


Pine Ridge Sidewalks

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. This will improve accessibility within Pine Ridge.

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.

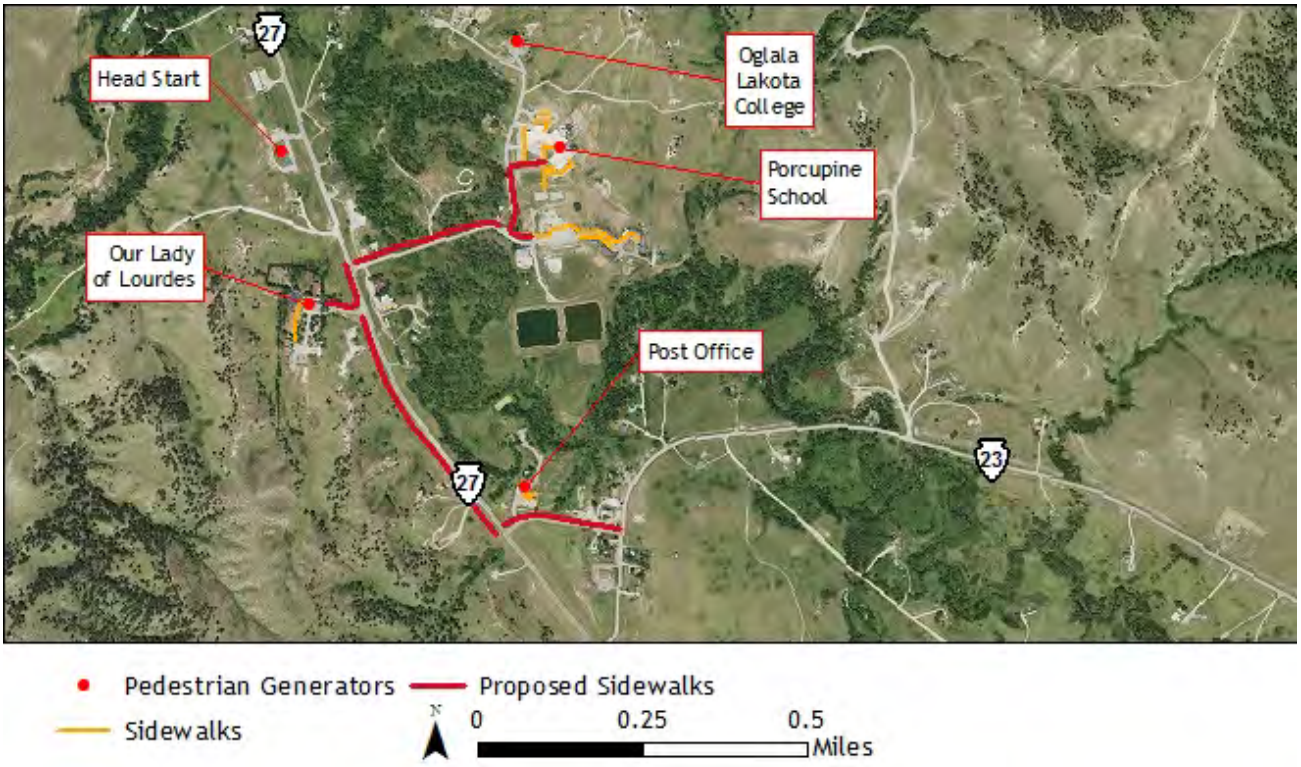
FIGURE 3-19 – Existing and Proposed Sidewalks – Pine Ridge



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.

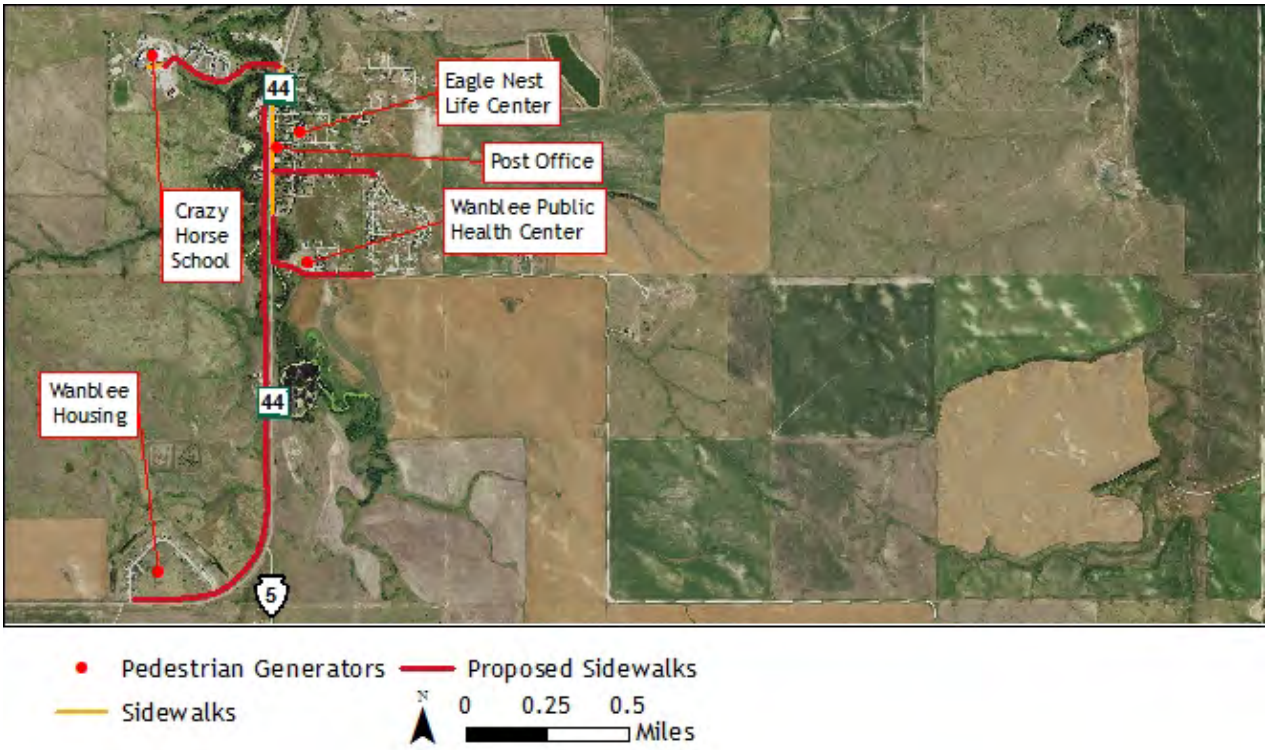
FIGURE 3-20 – Existing and Proposed Sidewalks – Porcupine



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 – 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 recommended short-term improvements include hangar building expansion, warehouses to serve potential retail and industrial customers, 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 Vetal 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. Many of the transit shelters are damaged or have graffiti that should be removed.

It is desirable 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	Time
Pine Ridge	5:15 AM	Oglala	5:35 AM
Oglala	5:40 AM	Prairie Wind	6:00 AM
Prairie Wind	6:50 AM	Oglala	7:10 AM
Oglala	7:15 AM	Pine Ridge	7:30 AM
Pine Ridge	8:00 AM	Oglala	8:20 AM
Oglala	8:25 AM	Prairie Wind	8:45 AM
Prairie Wind	9:00 AM	Oglala	9:20 AM
Oglala	9:25 AM	Pine Ridge	9:45 AM
Pine Ridge	10:30 AM	Oglala	10:45 AM
Oglala	10:50 AM	Prairie Wind	11:05 AM
Prairie Wind	11:15 AM	Oglala	11:35 AM
Oglala	11:40 AM	Pine Ridge	12:00 PM
Pine Ridge	12:30 PM	Oglala	12:50 PM
Oglala	12:55 PM	Prairie Wind	1:15 PM
Prairie Wind	1:30 PM	Oglala	1:45 PM
Oglala	1:50 PM	Pine Ridge	2:10 PM
Pine Ridge	2:30 PM	Oglala	2:50 PM
Oglala	2:55 PM	Prairie Wind	3:15 PM
Prairie Wind	3:35 PM	Oglala	3:50 PM
Oglala	3:55 PM	Pine Ridge	4:15 PM
Pine Ridge	5:00 PM	Oglala	5:20 PM
Oglala	5:25 PM	Prairie Wind	6:00 PM
Prairie Wind	6:55 PM	Oglala	7:20 PM
Oglala	7:25 PM	Pine Ridge	7:45 PM

Wednesday, Thursday and Friday's ONLY

Pine Ridge	9:10 PM		
Prairie Wind	10:15 PM		
Oglala	10:20 PM		
Pine Ridge	10:40 PM		
Wounded Knee	10:55 PM		
Porcupine	11:10 PM		
Sharp's	11:25 PM		
Kyle	11:45 AM		
Wanblee	12:45 AM	Pine Ridge	2:15 AM

Wanblee to Sharp's Relay

Departs	Time	Arrives	Time
Pine Ridge	5:00 AM	Kyle	6:05 AM
Kyle	6:20 AM	Sharp's	6:40 AM
Sharp's	6:50 AM	Kyle	7:05 AM
Kyle	7:10 AM	Potato Creek	7:30 AM
Potato Creek	7:35 AM	Wanblee	8:00 AM
Wanblee	8:05 AM	Potato Creek	8:35 AM
Potato Creek	8:35 AM	Kyle	8:50 AM
Kyle	8:55 AM	Sharp's	9:15 AM
Sharp's	9:30 AM	Evergreen	9:40 AM
Evergreen	9:45 AM	Porcupine	9:50 AM
Porcupine	9:50 AM	WK	10:00 AM
WK	10:05 AM	Pine Ridge	10:25 AM
Pine Ridge	11:30 AM	WK	11:45 AM
WK	11:45 AM	Porcupine	11:55 AM
Porcupine	11:55 AM	Sharp's	12:05 PM
Sharp's	12:10 AM	Kyle	12:35 PM
Kyle	12:40 PM	Potato Creek	1:00 PM
Potato Creek	1:00 PM	Wanblee	1:25 PM
Wanblee	1:30 PM	Potato Creek	1:55 PM
Potato Creek	1:55 PM	Kyle	2:15 PM
Kyle	2:30 PM	Sharp's	2:50 PM
Sharp's	2:55 PM	Evergreen	3:05 PM
Evergreen	3:10 PM	Porcupine	3:20 PM
Porcupine	3:25 PM	WK	3:35 PM
WK	3:40 PM	Pine Ridge	4:00 PM

Wednesday, Thursday and Friday ONLY

There will be a bus back to Wanblee

Red Shirt/Drywood to Pine Ridge

Leaves	Time	Arrives	Time
Transit Station	5:30 AM	Drywood	6:15 AM
Drywood	6:18 AM	Red Shirt	6:48 AM
Red Shirt	6:50 AM	Drywood	7:17 AM
Drywood	7:20 AM	Pine Ridge	7:45 AM
Transit	5:00 PM	Drywood	5:35 PM
Drywood	5:37 PM	Red Shirt	6:07 PM
Red Shirt	6:10 PM	Drywood	6:40 PM
Drywood	6:40 PM	Transit	7:25 PM

Pine Ridge to Sharp's

Departs	Time	Arrives	Time
Pine Ridge	5:45 AM	Wounded Knee	6:00 AM
Wounded Knee	6:05 AM	Porcupine	6:15 AM
Porcupine	6:20 AM	Evergreen	6:25 AM
Evergreen	6:27 AM	Sharp's	6:35 AM
Sharp's	6:40 AM	Evergreen	6:45 AM
Evergreen	6:47 AM	Porcupine	6:50 AM
Porcupine	6:55 AM	Wounded Knee	7:05 AM
Wounded Knee	7:10 AM	Pine Ridge	7:30 AM
Pine Ridge	5:00 PM	Wounded Knee	5:18 PM
Wounded Knee	5:18 PM	Porcupine	5:28 PM
Porcupine	5:30 PM	Evergreen	5:35 PM
Evergreen	5:40 PM	Sharp's	5:45 PM
Sharp's	5:55 PM	Kyle	6:15 PM
Kyle	6:20 PM	Potato Creek	6:40 PM
Potato Creek	6:45 PM	Wanblee	7:10 PM
Wanblee	7:15 PM	Wanblee	7:10 PM
Wanblee	7:15 PM	Pine Ridge	9:10 PM

Wednesday, Thursday and Friday ONLY

There will be a bus back to Wanblee

Pine Ridge to Martin

Departs	Time	AM	Arrives	Time
Pine Ridge	5:15	AM		
Batesland	5:45	AM	Martin	6:05 AM
Martin	6:15	AM	Allen	6:40 AM
Allen	6:45	AM		
Batesland	7:15	AM	Pine Ridge	7:50 AM
Pine Ridge	11:00	AM		
Batesland	11:30	AM	Allen	11:55 AM
Allen	12:00	AM	Martin	12:20 AM
Martin	12:30	PM		
Batesland	12:50	AM		
Pine Ridge	1:20	PM		
Pine Ridge	5:00	PM		
Batesland	5:35	PM	Martin	5:55 PM
Martin	6:05	PM	Allen	6:30 PM
Allen	6:35	PM		
Batesland	7:00	PM	Pine Ridge	7:30 PM

Wednesday, Thursday and Friday ONLY

Manderson to Pine Ridge

Departs	Time	Arrives	Time
Pine Ridge	5:45 AM	No. Manderson	6:15 AM
No. Manderson	6:35 AM	Manderson	6:50 AM
Manderson	6:55 AM	Wounded Knee	7:10 AM
Wounded Knee	7:15 AM	Manderson	7:30 AM
Manderson	7:45 AM	Wounded Knee	8:00 AM
Wounded Knee	8:05 AM	Manderson	8:20 AM
Manderson	8:35 AM	Wounded Knee	8:50 AM
Wounded Knee	8:55 AM	Manderson	9:10 AM
Manderson	9:20 AM	Wounded Knee	9:35 AM
Wounded Knee	9:40 AM	Pine Ridge	10:00 AM
Pine Ridge	11:15 AM	Manderson	11:45 AM
Manderson	11:50 AM	Wounded Knee	12:05 PM
Wounded Knee	12:10 PM	Pine Ridge	12:30 PM
Pine Ridge	4:00 PM	Manderson	4:30 PM
Manderson	4:40 PM	Wounded Knee	5:15 PM
Wounded Knee	5:20 PM	Manderson	5:35 PM
Manderson	5:40 PM	Wounded Knee	5:55 PM
Wounded Knee	6:00 PM	Pine Ridge	6:30 PM

Wednesday , Thurdsay and Friday ONLY

There will be a 10:30 bus back to Wk/Manderson

Slim Buttes to Pine Ridge

Leaves	Time	Arrives	Time
Runs only when Passenger calls in			
Transit Station	7:00 AM	Slim Buttes	7:30 AM
Slim Buttes	7:35 AM	Pine Ridge	8:00 AM
Available Bus Driver			
Transit Station	2:00 PM	Slim Buttes	2:25 PM
Slim Buttes	2:35 PM	Pine Ridge	3:00 PM
Available Bus Driver			
Transit Station	3:00 PM	Slim Buttes	3:25 PM
Slim Buttes	3:35 PM	Pine Ridge	4:00 PM
Availible Bus Driver			

FIGURE 3-23 –OST Transit Service Routes

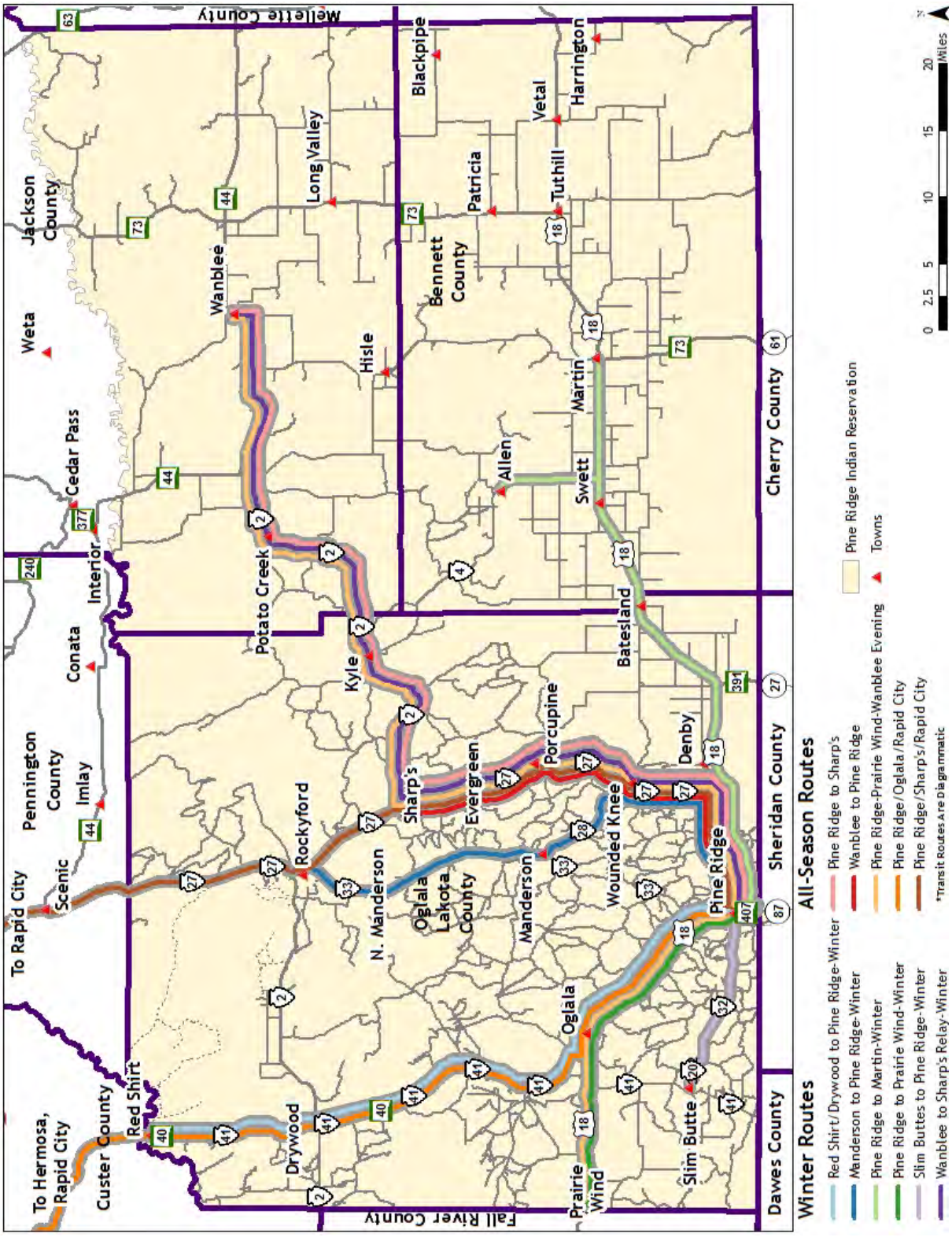


FIGURE 3-24 – Pine Ridge Transit Service Schedule

PINE RIDGE VILLAGE TOWN LOOP

1st RUN		
Transit Station	7:00 AM	East Ridge	7:04 AM
East Ridge	7:05 AM	North Ridge	7:08 AM
North Ridge	7:09 AM	Cohen Home	7:11 AM
Cohen Home	7:12 AM	Court Yards	7:15 AM
Court Yards	7:16 AM	PRHS/OLC	7:19 AM
PRHS/OLC	7:20 AM	Tribal Office	7:24 AM
Tribal Office	7:25 AM	Cherry Hill	7:28 AM
Cherry Hill	7:29 AM	Justice Center	7:33 AM
Justice Center	7:34 AM	Sioux Nation	7:37 AM
Sioux Nation	7:38 AM	Crazy Horse	7:41 AM
Crazy Horse	7:42 AM	Yellow Birds	7:45 AM
Yellow Birds	7:46 AM	Dialysis	7:49 AM
Elderly Complex	7:50AM	Hospital	7:52 AM
Hospital	7:53 AM	Dept. Soc. Serv	7:57 AM
Dept. Soc. Serv	7:58 AM	Transit	8:00 AM
2nd RUN			
Transit Station	8:00 AM	Hospital	8:03 AM
Hospital	8:04 AM	Elderly Complex	8:05 AM
Dialysis	8:06 AM	Commodities	8:09 AM
Commodities	8:10 AM	Yellow Birds	8:12 AM
Yellow Birds	8:13 AM	Crazy Horse	8:15 AM
Crazy Horse	8:16 AM	Justice Center	8:21 AM
Justice Center	8:22 AM	Cherry Hill	8:27 AM
Cherry Hill	8:28 AM	Sioux Nation	8:30 AM
Sioux Nation	8:31 AM	PR School/OLC	8:35 AM
PRHS/OLC	8:36 AM	Cohen Home	8:41 AM
Cohen Home	8:42 AM	North Ridge	8:44 AM
North Ridge	8:45 AM	East Ridge	8:47 AM
East Ridge	8:48 AM	Transit Station	8:51 AM
3rd RUN			
Transit Station	9:00 AM	East Ridge	9:04 AM
East Ridge	9:05 AM	North Ridge	9:08 AM
North Ridge	9:09 AM	Cohen Home	9:11 AM
Cohen Home	9:12 AM	Court Yards	9:15 AM
Court Yards	9:16 AM	PRHS/OLC	9:19 AM
PRHS/OLC	9:20 AM	Tribal Office	9:24 AM
Tribal Office	9:25 AM	Cherry Hill	9:28 AM
Cherry Hill	9:29 AM	Justice Center	9:33 AM
Justice Center	9:34 AM	Sioux Nation	9:37 AM
Sioux Nation	9:38 AM	Crazy Horse	9:41 AM
Crazy Horse	9:42 AM	Yellow Birds	9:45 AM
Yellow Birds	9:46 AM	Dialysis	9:49 AM
Elderly Complex	9:50AM	Hospital	9:52 AM
Hospital	9:53 AM	Dept. Soc. Serv	9:57 AM
Dept. Soc. Serv	9:58 AM	Transit	9:59 AM

4th RUN			
Transit Station	10:00 AM	Hospital	10:03 AM
Hospital	10:04 AM	Elderly Complex	10:05 AM
Dialysis	10:06 AM	Commodities	10:09 AM
Commodities	10:10 AM	Yellow Birds	10:12 AM
Yellow Birds	10:13 AM	Crazy Horse	10:15 AM
Crazy Horse	10:16 AM	Justice Center	10:21 AM
Justice Center	10:22 AM	Cherry Hill	10:27 AM
Cherry Hill	10:28 AM	Sioux Nation	10:30 AM
Sioux Nation	10:31 AM	PR School/OLC	10:35 AM
PR HS/OLC	10:36 AM	Cohen Home	10:41 AM
Cohen Home	10:42 AM	North Ridge	10:44 AM
North Ridge	10:45 AM	East Ridge	10:47 AM
East Ridge	10:48 AM	Transit Station	10:51 AM
5th RUN			
Transit Station	11:00 AM	East Ridge	11:04 AM
East Ridge	11:05 AM	North Ridge	11:08 AM
North Ridge	11:09 AM	Cohen Home	11:11 AM
Cohen Home	11:12 AM	Court Yards	11:15 AM
Court Yards	11:16 AM	PRHS/OLC	11:19 AM
PRHS/OLC	11:20 AM	Tribal Office	11:24 AM
Tribal Office	11:25 AM	Cherry Hill	11:28 AM
Cherry Hill	11:29 AM	Justice Center	11:33 AM
Justice Center	11:34 AM	Sioux Nation	11:37 AM
Sioux Nation	11:38 AM	Crazy Horse	11:41 AM
Crazy Horse	11:42 AM	Yellow Birds	11:45 AM
Yellow Birds	11:46 AM	Dialysis	11:49 AM
Elderly Complex	11:50AM	Hospital	11:52 AM
Hospital	11:53 AM	Dept. Soc. Serv	11:57 AM
Dept. Soc. Serv	11:58 AM	Transit	11:59 AM
6th RUN			
Transit Station	12:00 PM	Hospital	12:03 PM
Hospital	12:04 PM	Elderly Complex	12:05 PM
Dialysis	12:06 PM	Commodities	12:09 PM
Commodities	12:10 PM	Yellow Birds	12:12 PM
Yellow Birds	12:13 PM	Crazy Horse	12:15 PM
Crazy Horse	12:16 PM	Justice Center	12:21 PM
Justice Center	12:22 PM	Cherry Hill	12:27 PM
Cherry Hill	12:28 PM	Sioux Nation	12:30 PM
Sioux Nation	12:31 PM	PR School/OLC	12:35 PM
PR HS/OLC	12:36 PM	Cohen Home	12:41 PM
Cohen Home	12:42 PM	North Ridge	12:44 PM
North Ridge	12:45 PM	East Ridge	12:47 PM
East Ridge	12:48 PM	Transit Station	12:51 PM

7th RUN			
Transit Station	1:00 PM	East Ridge	1:04 PM
East Ridge	1:05 PM	North Ridge	1:08 PM
North Ridge	1:09 PM	Cohen Home	1:11 PM
Cohen Home	1:12 PM	Court Yards	1:15 PM
Court Yards	1:16 PM	PRHS/OLC	1:19 PM
PRHS/OLC	1:20 PM	Tribal Office	1:24 PM
Tribal Office	1:25 PM	Cherry Hill	1:28 PM
Cherry Hill	1:29 PM	Justice Center	1:33 PM
Justice Center	1:34 PM	Sioux Nation	1:37 PM
Sioux Nation	1:38 PM	Crazy Horse	1:41 PM
Crazy Horse	1:42 PM	Yellow Birds	1:45 PM
Yellow Birds	1:46 PM	Dialysis	1:49 PM
Elderly Complex	1:50 PM	Hospital	1:52 PM
Hospital	1:53 PM	Dept. Soc. Serv	1:57 PM
Dept. Soc. Serv	1:58 PM	Transit	1:59 PM
8th RUN			
Transit Station	2:00 PM	Hospital	2:03 PM
Hospital	2:04 PM	Elderly Complex	2:05 PM
Dialysis	2:06 PM	Commodities	2:09 PM
Commodities	2:10 PM	Yellow Birds	2:12 PM
Yellow Birds	2:13 PM	Crazy Horse	2:15 PM
Crazy Horse	2:16 PM	Justice Center	2:21 PM
Justice Center	2:22 PM	Cherry Hill	2:27 PM
Cherry Hill	2:28 PM	Sioux Nation	2:30 PM
Sioux Nation	2:31 PM	PR School/OLC	2:35 PM
PR HS/OLC	2:36 PM	Cohen Home	2:41 PM
Cohen Home	2:42 PM	North Ridge	2:44 PM
North Ridge	2:45 PM	East Ridge	2:47 PM
East Ridge	2:48 PM	Transit Station	2:51 PM
9th RUN			
Transit Station	3:00 PM	East Ridge	3:04 PM
East Ridge	3:05 PM	North Ridge	3:08 PM
North Ridge	3:09 PM	Cohen Home	3:11 PM
Cohen Home	3:12 PM	Court Yards	3:15 PM
Court Yards	3:16 PM	PRHS/OLC	3:19 PM
PRHS/OLC	3:20 PM	Tribal Office	3:24 PM
Tribal Office	3:25 PM	Cherry Hill	3:28 PM
Cherry Hill	3:29 PM	Justice Center	3:33 PM
Justice Center	3:34 PM	Sioux Nation	3:37 PM
Sioux Nation	3:38 PM	Crazy Horse	3:41 PM
Crazy Horse	3:42 PM	Yellow Birds	3:45 PM
Yellow Birds	3:46 PM	Dialysis	3:49 PM
Elderly Complex	3:50 PM	Hospital	3:52 PM
Hospital	3:53 PM	Dept. Soc. Serv	3:57 PM
Dept. Soc. Serv	3:58 PM	Transit Station	3:59 PM

10th RUN			
Transit Station	4:00 PM	East Ridge	4:04 PM
East Ridge	4:05 PM	North Ridge	4:08 PM
North Ridge	4:09 PM	Cohen Home	4:11 PM
Cohen Home	4:12 PM	Justice Center	4:22 PM
Justice Center	4:23 PM	PR School/ OLC	4:30 PM
PR HS/OLC	4:31 PM	Court Yards	4:38 PM
Court Yards	4:39 PM	Tribal Office	4:41 PM
Tribal Office	4:42 PM	Big Bats	4:43 PM
Big Bats	4:44 PM	Dialysis	4:46 PM
Elderly Complex	4:47 PM	Hospital	4:49 PM
Hospital	4:50 PM	Transit Station	4:55 PM

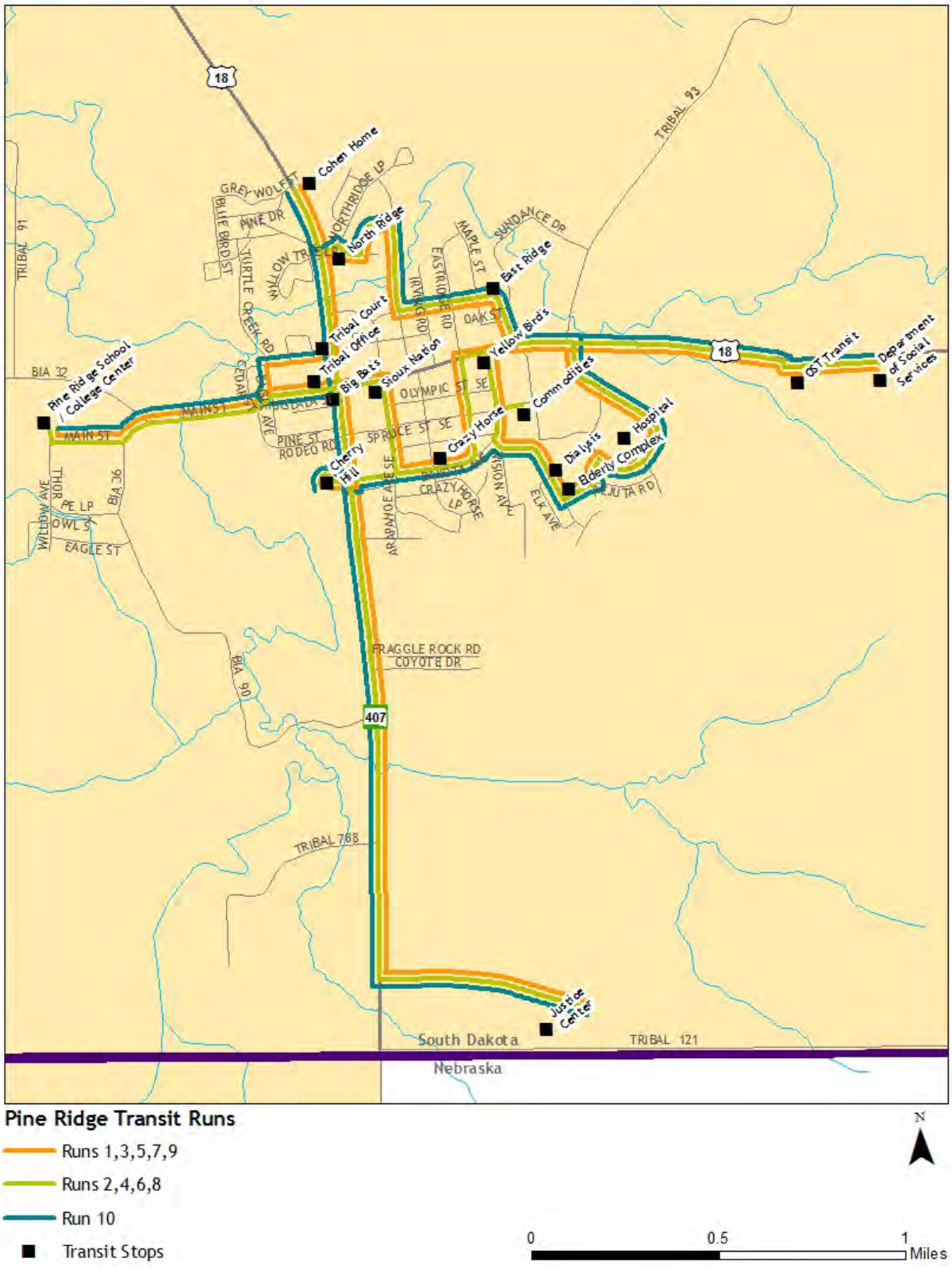
BUS FARES

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



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 or in close proximity to 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

Route	Location	Vehicles/Day
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

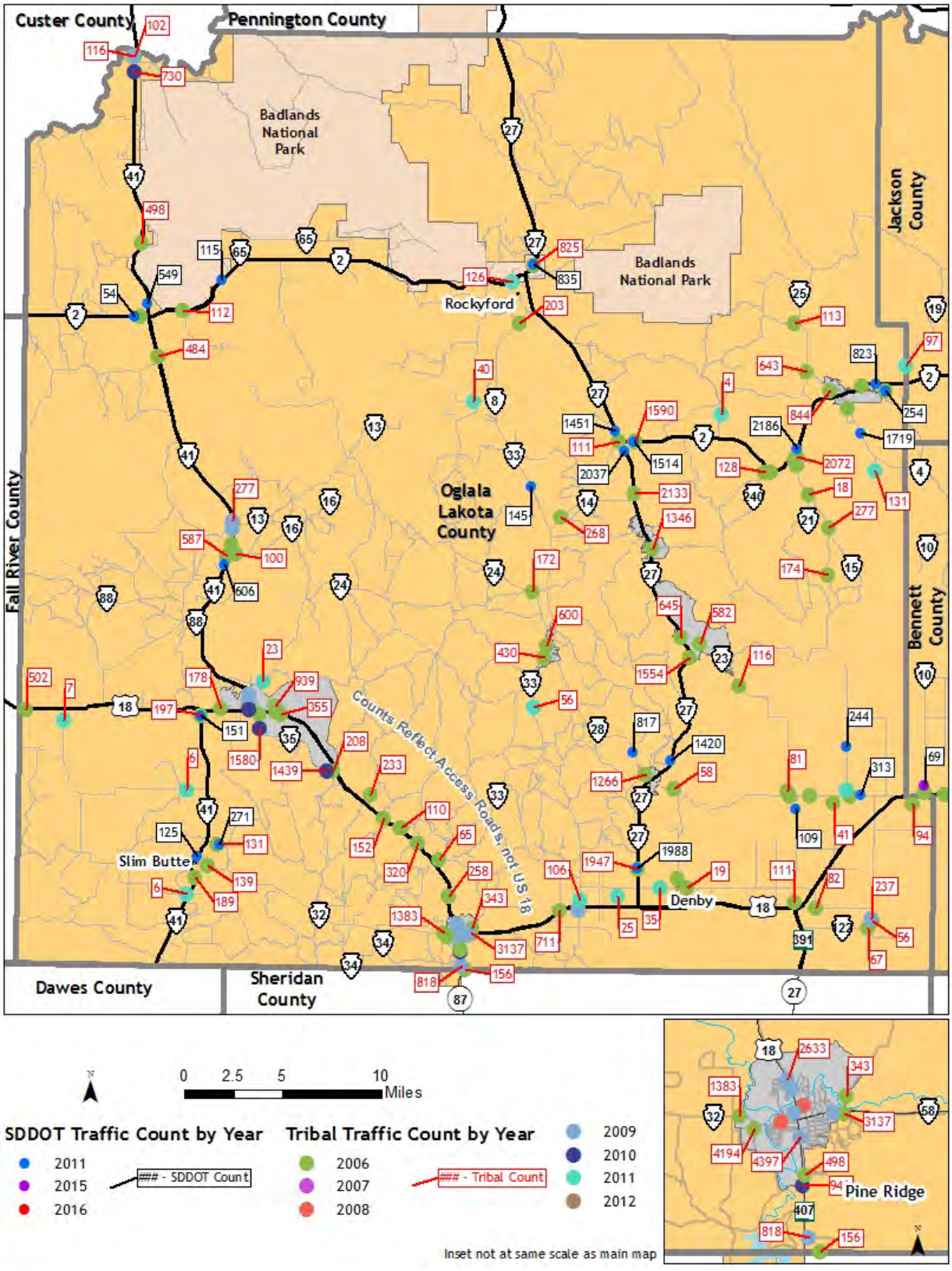


FIGURE 3-30 – Existing Average Daily Traffic

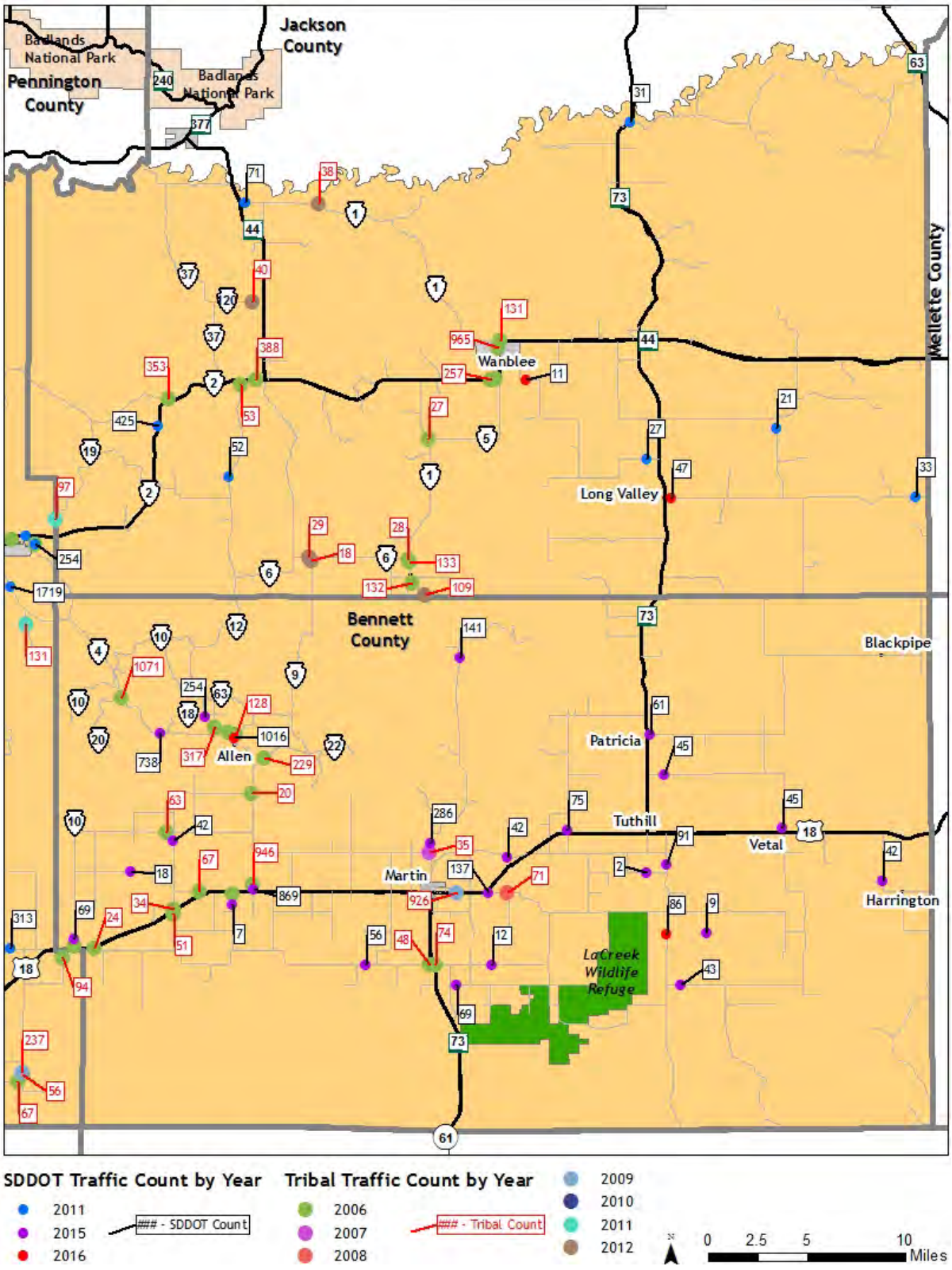


FIGURE 3-31 – Year 2043 Projected Average Daily Traffic

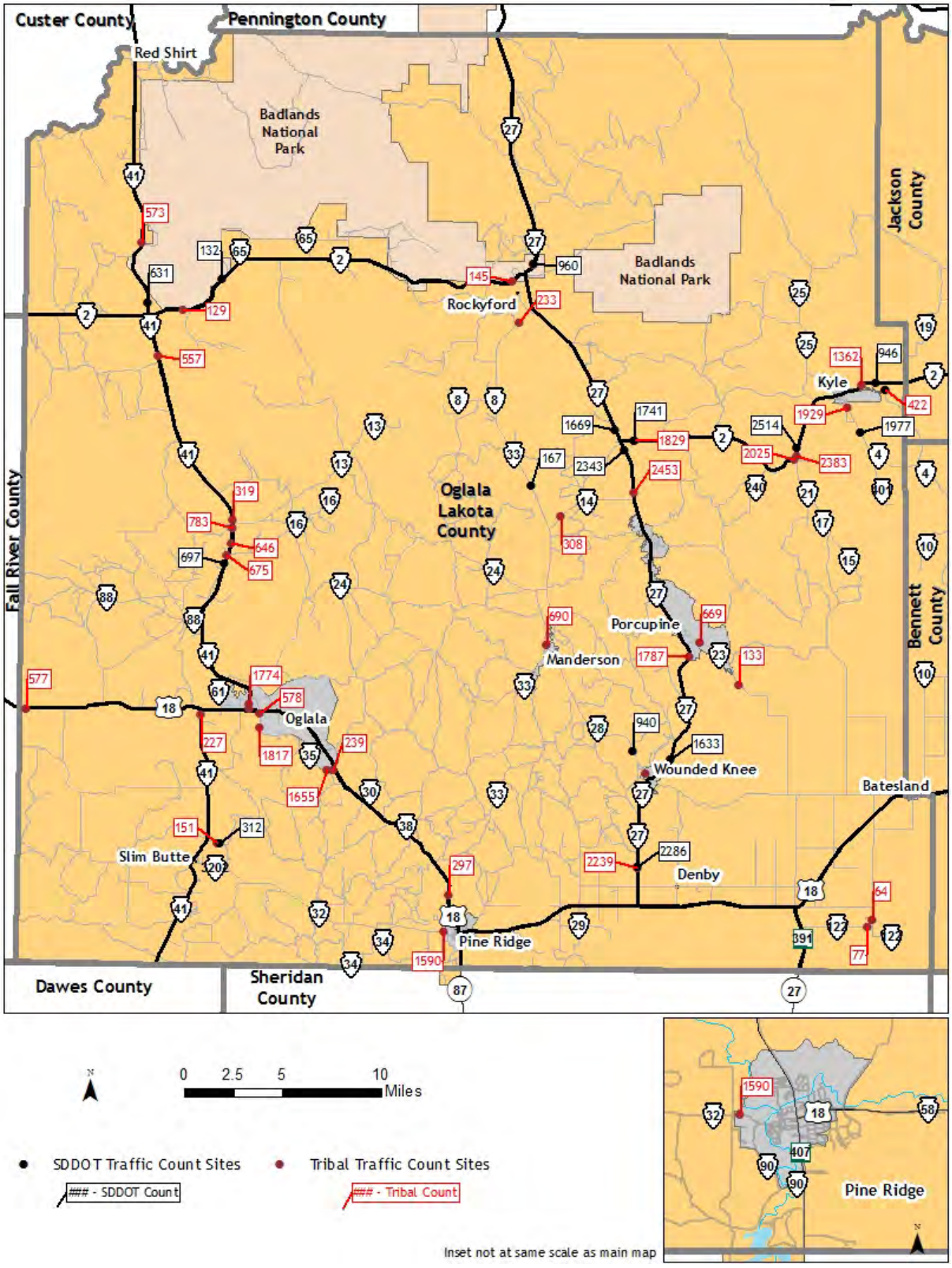
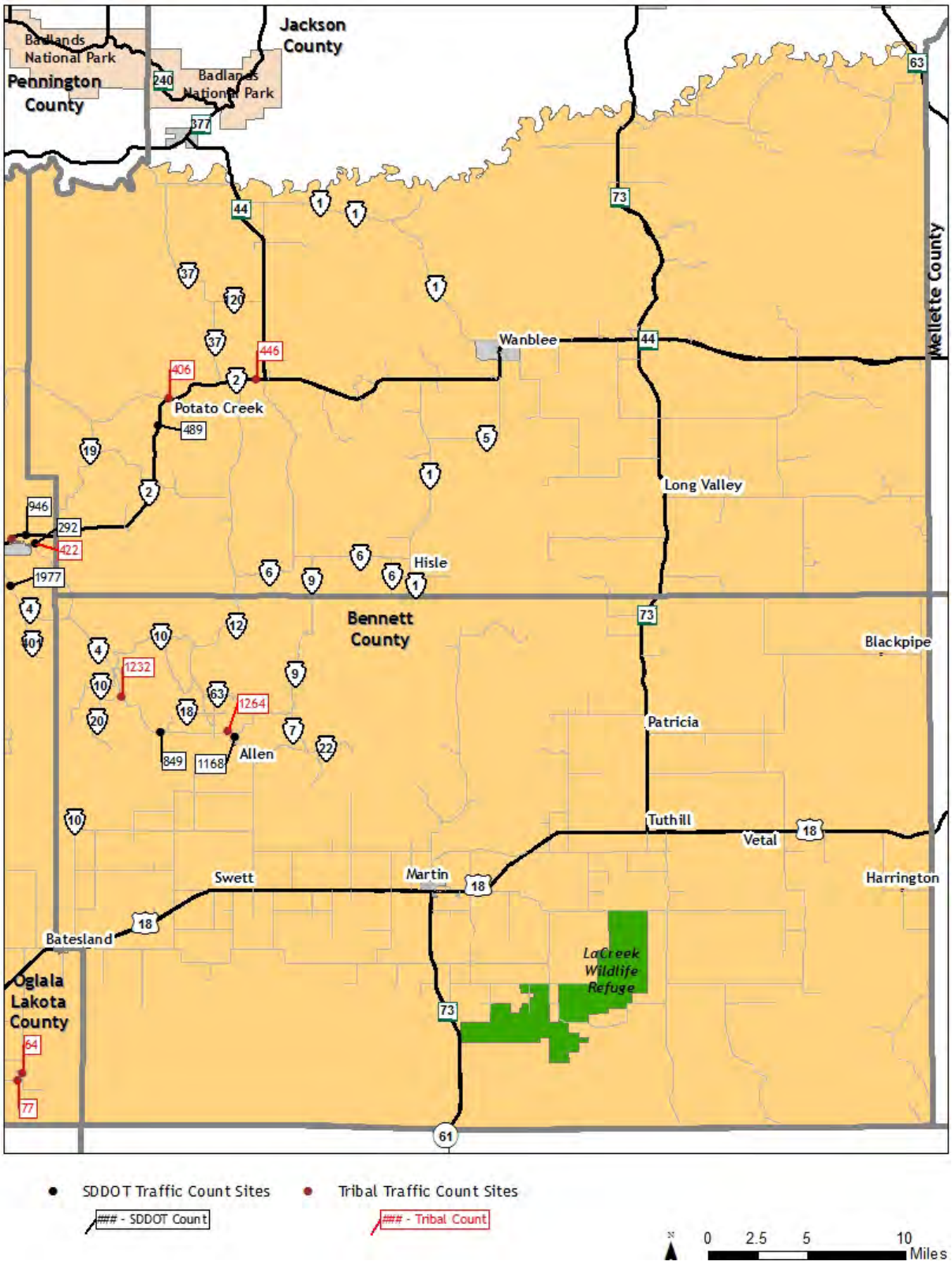


FIGURE 3-32 – Year 2043 Projected Average Daily Traffic



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

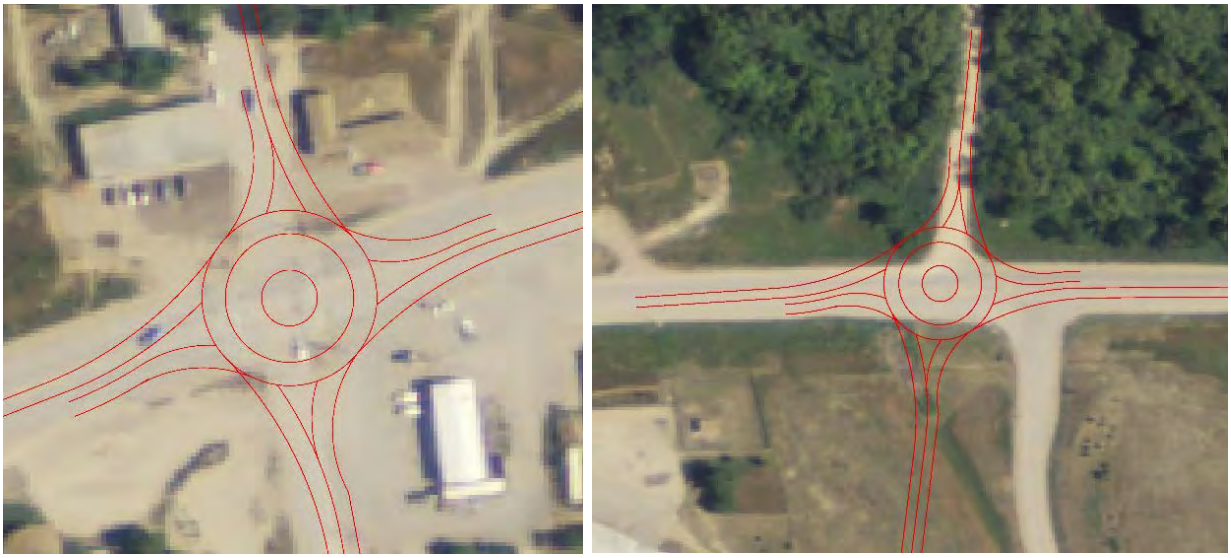


FIGURE 3-34 – Sharps Corner Store Conceptual Circulation Plan



Sharps Corner Grocery Store Parking Layout

N 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

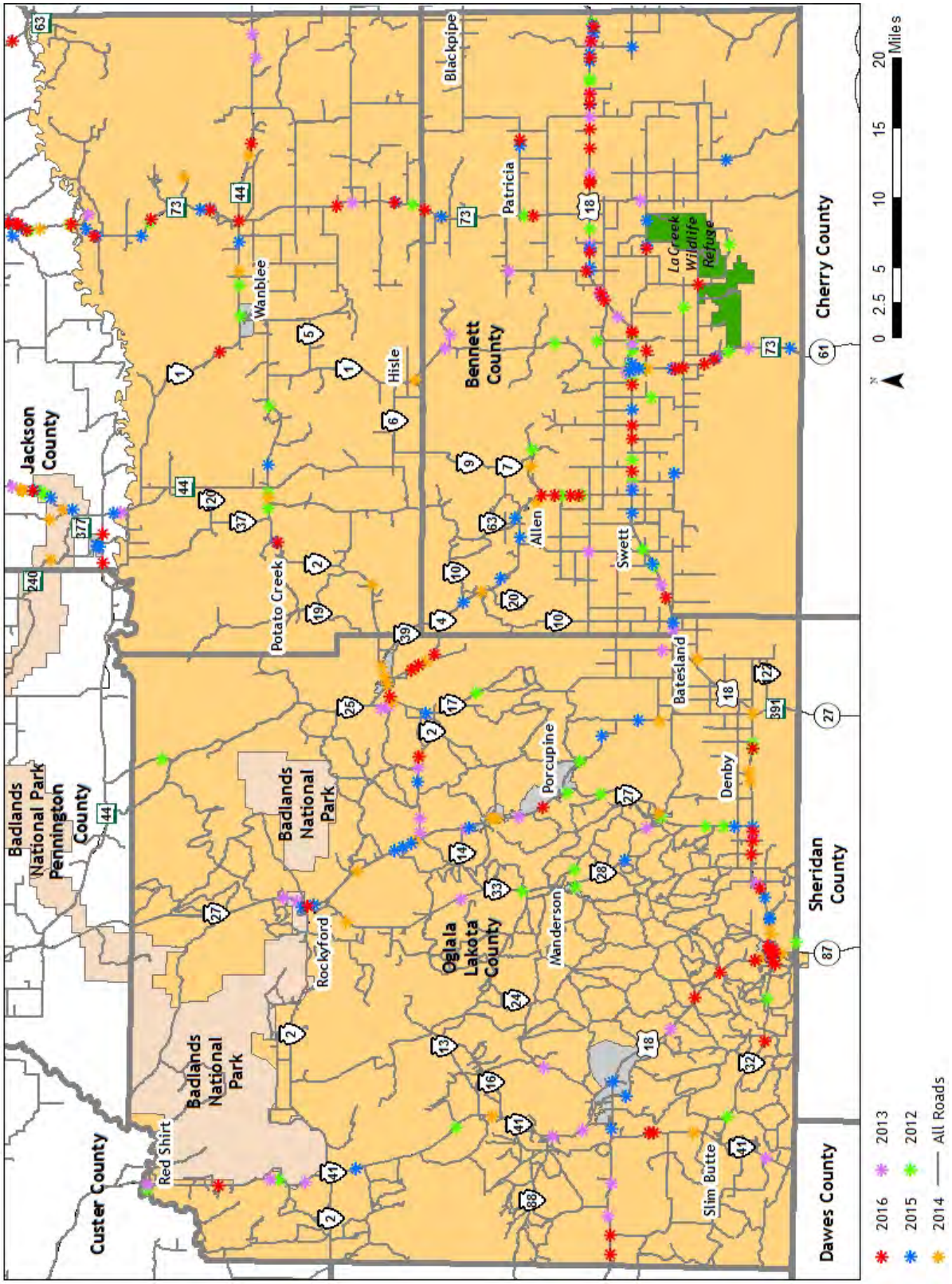
Crash locations that occurred from 2012 to 2016 on the OST Reservation were mapped by year in Figure 3-36. Most of the crashes occurred on the US and State Highway Systems. This is not unexpected, as traffic volumes are highest along those roadways. Off those systems, it is valuable to see locations on the BIA road system where crashes are most frequent. Example corridors include BIA 2, BIA 4, BIA 32, and BIA 33. 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.

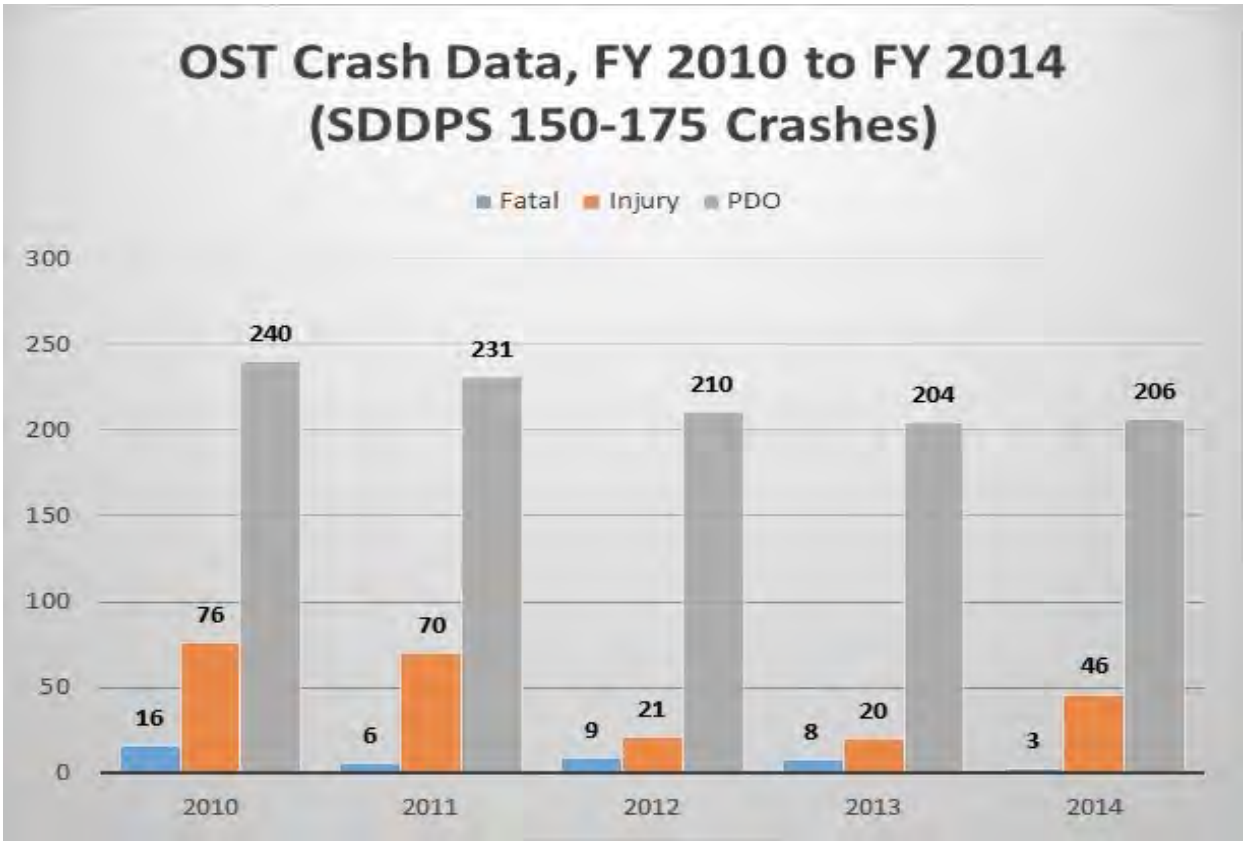
FIGURE 3-36 – Pine Ridge Indian Reservation Crashes



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.

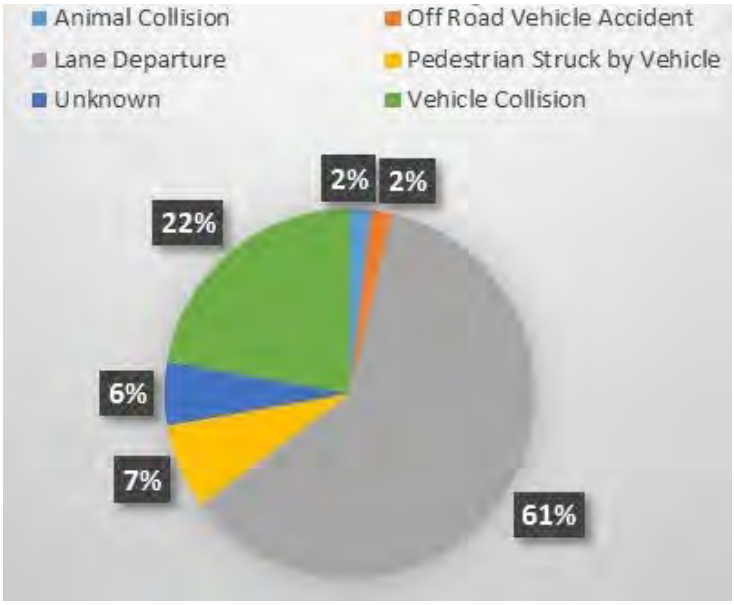
FIGURE 3-37 – Pine Ridge Indian Reservation Crashes



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.

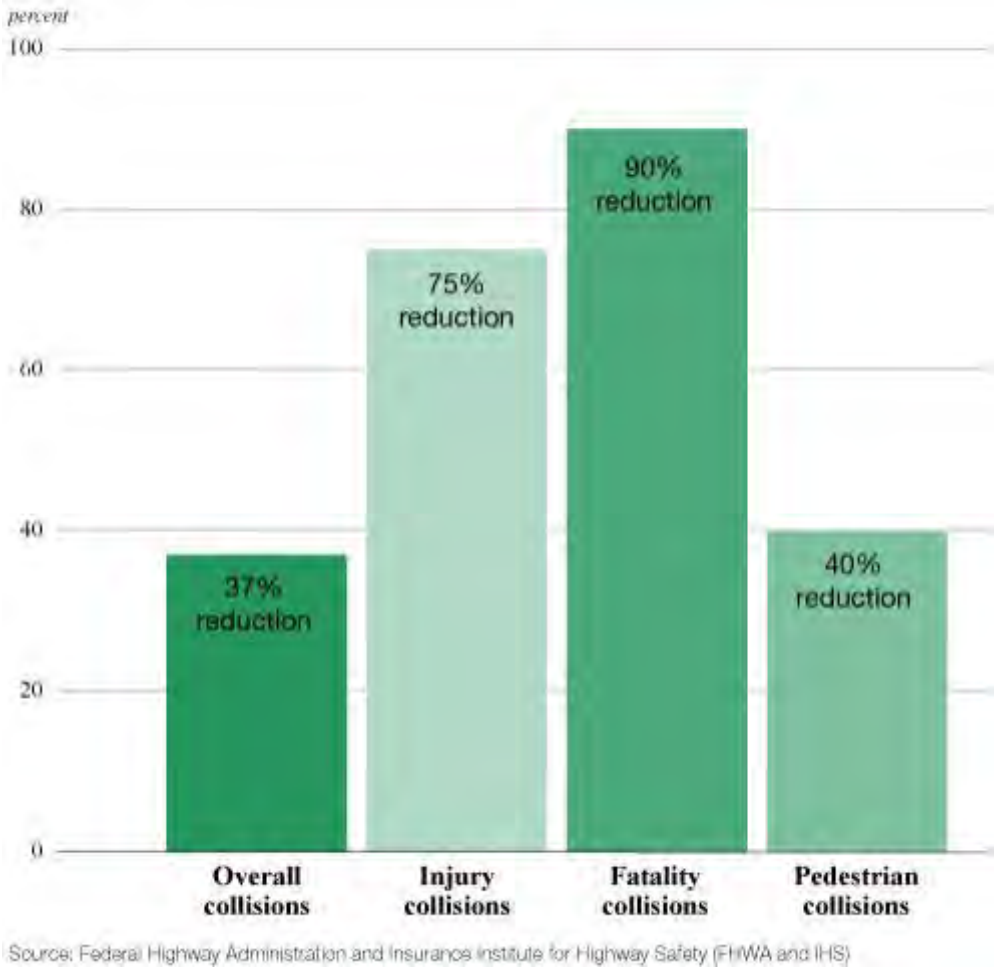
Roundabouts

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 IHS)

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.** Over time, the RMD has seen the cost of snow removal, hauling gravel, and other maintenance activities continue to escalate. 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 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 to perform a chip seal project on many of the OST's paved roads, including a number of subdivision 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 F.

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. The PowerPoint presentation, sign in sheet, and meeting summary from each meeting is included in Appendix F. 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. A public input meeting opportunity was advertised to receive feedback on the draft LRTP Report. The feedback that is received, if any, 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 F.

Information at the meetings included PowerPoint, visual displays, exhibits and illustrative drawings. Public meetings were announced in the Lakota Country Times and the Rapid City Journal to encourage attendance and notify interested parties of the

input opportunities. For the advertised public meeting opportunity, copies of the draft Report were made available for viewing at OST Transportation.

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. (Note – this is a county road)
    - 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 (Note – most of this is a county road)
    - 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.
  - 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. The wheel tax item was given to the attorneys for the OST for them to write the law and nothing has come of it. The OST also needs laws for overweight vehicles and haul road agreements. Future laws to obtain these additional funds, if exercised, would require staffing and resources to implement.
- Off 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 maintenance staff at the OSLH main office. 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.

Further, it is understood that there is a lot of frustration from the public that there are a lot of dirt and gravel roads that have not received adequate attention to address maintenance needs. This LRTP attempts to provide strategies for increased maintenance and continued success in seeking additional funding. It is hoped that this will lead to growing efforts to improve these roads over time.

CHAPTER 5 - PAVED ROAD & 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 (See PMP Excerpt found in Appendix G). 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, pothole patching, and pavement marking. 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 of new equipment.

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 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 and allow 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.

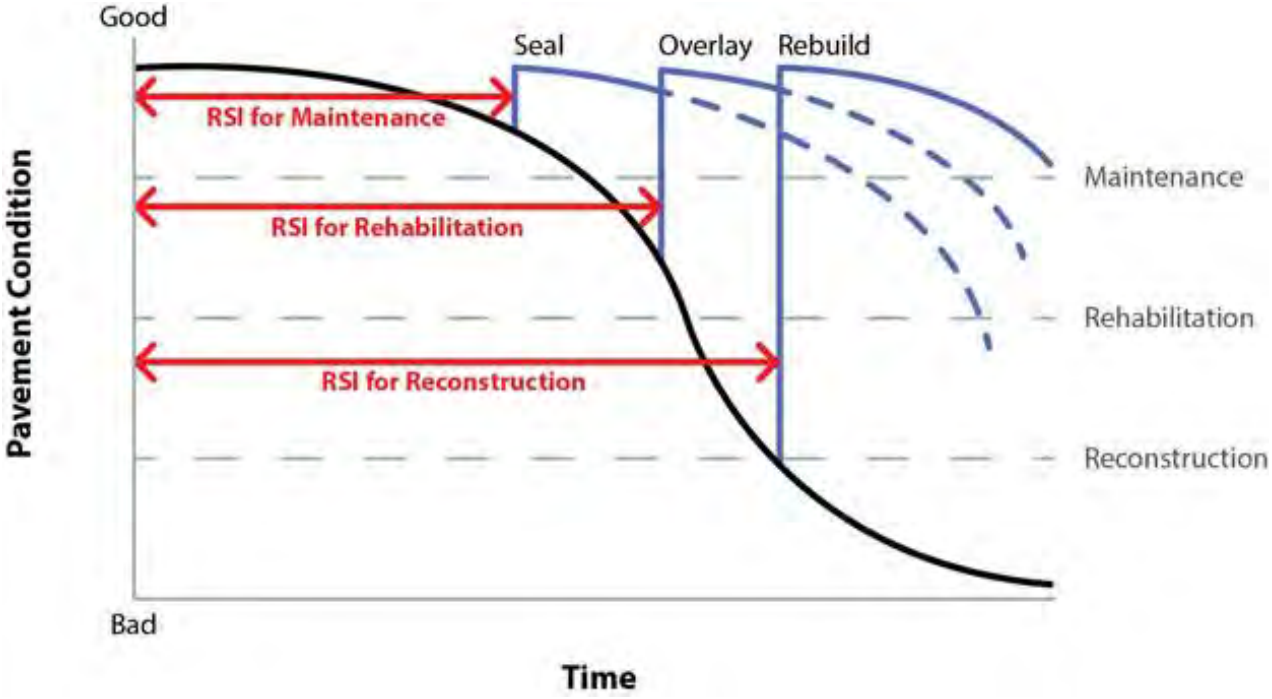
The pavement management system's measurements of pavement condition over a period of time before and after the application of preventive maintenance makes it possible to determine the extended service life of a treatment. This is reflected in Figure 5-2.

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



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 primitive and gravel road systems 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 range priority paving 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 - Cuny 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
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
	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.	Other Paved BIA and Tribal Roads*	271	-	-	Varied Paving	$ 219,624,179.00	Cross Section and Surfacing*
Misc.	Wind Farm Route Improvements	-	-	-	New Construction	$ 30,000,000.00	Road, structural and drainage
*See Appendix K					Total	$ 349,340,929.00	

It is hoped that some projects identified for completion during the long range element of the LRTP can be moved into the short range element of the LRTP. This can be done if additional funding sources are found, or if Tribal priorities change.

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. Improved lighting can not only enhance security for residents but can also reduce the occurrence of crashes after dark.

It is recommended that the OST conduct a future study to identify locations where existing lighting does not work, the types and locations for needed street lighting throughout the Reservation, and that lighting improvements be prioritized and completed as funding becomes available. Future Tribal Council resolutions to improve lighting should include statements of responsibility for lighting maintenance and electric bill payment.

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 provided to the OSTDOT.

A list of all bridges, their location and 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 $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.

Gravel road project priorities mentioned by the OST during the public meetings are shown in Figure 6-1. The full list of identified gravel road project needs is provided in Appendix J. These needs are extensive, estimated at a total of $815,133,200 needed to bring roads to current standards.

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
1	Craven Road Solid Waste Site	0.1	Site is muddy and needs gravel	$ 1,000
1	Craven Road	18	Gravel Rehabilitation	$ 2,700,000
	Garnier Lane	1.8	By Lone Man School	$ 10,000
	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
16	North of Oglala	3	Continued upgrades	$ 15,000
29	Wolf Creek Housing Road	2	Address wash boards	$ 10,000
24	Grass Creek Rd - Oglala to Manderson	21.4	Gravel and Route upgrades	$ 10,485,600

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, transit facilities and operations, and airport improvements 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-soot 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 –Sidewalk, Shared use Path, and Path Lighting Priorities

Priority	BIA Route	Location	Length	Cost	Description
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.

AIRPORT IMPROVEMENTS

Recommended short-term improvements include hangar building expansion, warehouses to serve potential retail and industrial customers, 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.

CHAPTER 8 - OTHER TECHNOLOGY RECOMMENDATIONS

There are many types of technology that the OST can pursue to benefit their transportation system. This LRTP supports expanded use of technology as priorities and funding allows.

POTENTIAL TECHNOLOGY APPLICATIONS

A list of potential future project applications is provided as follows:

- Road surface sensors – beneficial to remotely report road surface conditions
- Location observation cameras – useful for continuous observation of key locations around the Reservation
- Weather billboards – beneficial to provide weather and temperature information to the traveling public, two-way boards could be installed along key corridors within the Reservation. Placement along US Highway 18 north and east of Pine Ridge would be an example of highly traveled placement locations.
- Electrical car fueling stations – growing potential to provide needed service to electric car drivers
- Changeable message signs – useful for construction sites, crash sites, and other purposes
- Culvert rovers – useful to increase the safety and effectiveness of culvert inspections
- Drones – useful for remote construction observation and inspection for a variety of field conditions inspections (See Appendix H for more information on Drone applications)

The cost of these technology improvements is highly variable based on the types, numbers and design selected for a given application. It is recommended that the OST consider priorities for these applications and apply for available grants that may present these as eligible projects.

CHAPTER 9 - 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.

The Thunder Valley Development is an excellent example of current housing, retail, and office development underway that will benefit the OST for years to come. Continued Tribal efforts should support this and similar development proposals.

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 9-1 through 9-7.

FIGURE 9-1 –High-Speed Paved BIA Road Typical Section

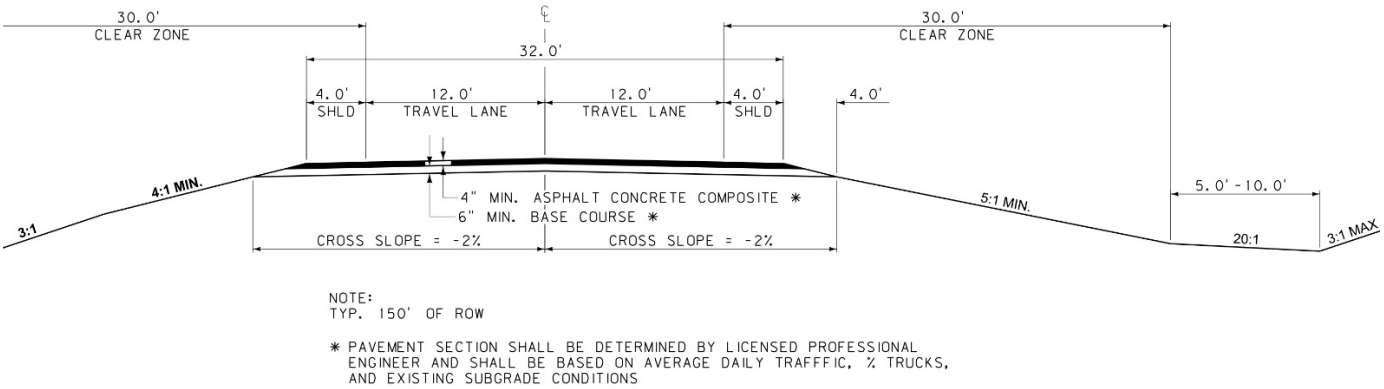


FIGURE 9-2 –High-Speed Gravel Road Typical Section

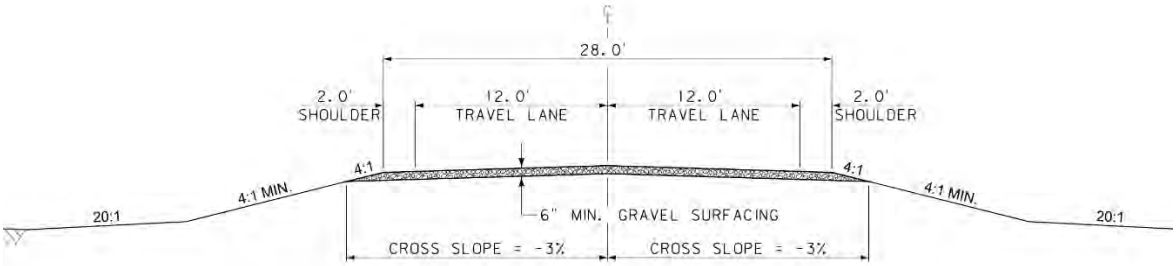


FIGURE 9-3 –Low Speed Gravel Road Typical Section

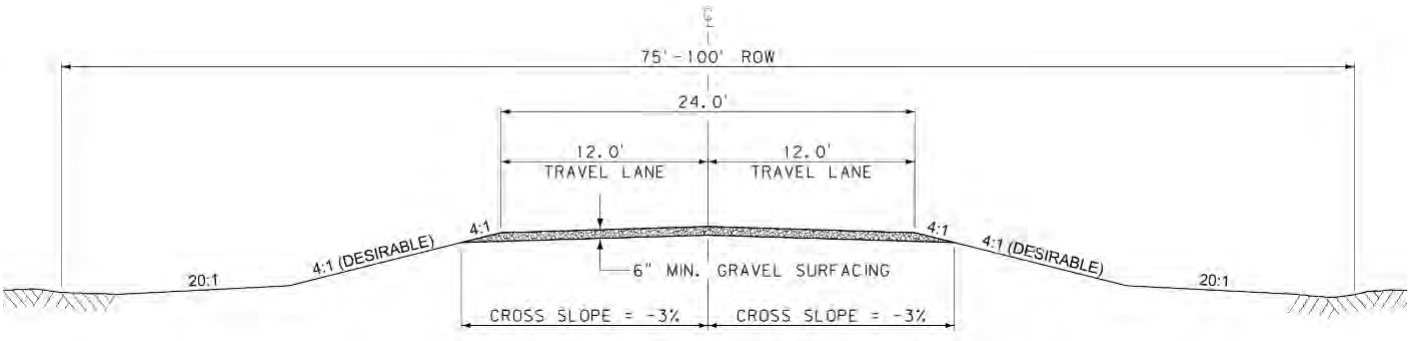
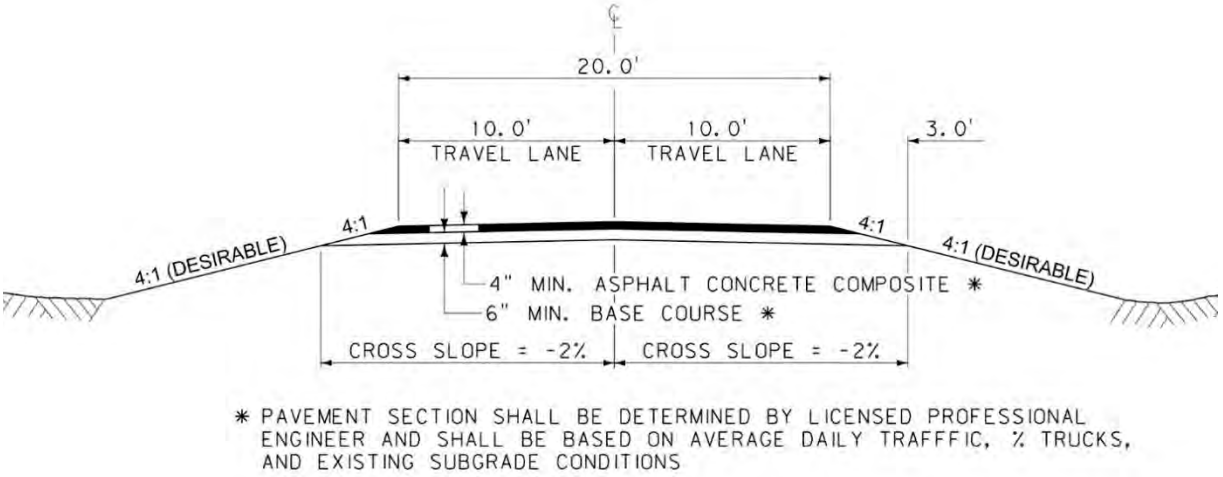
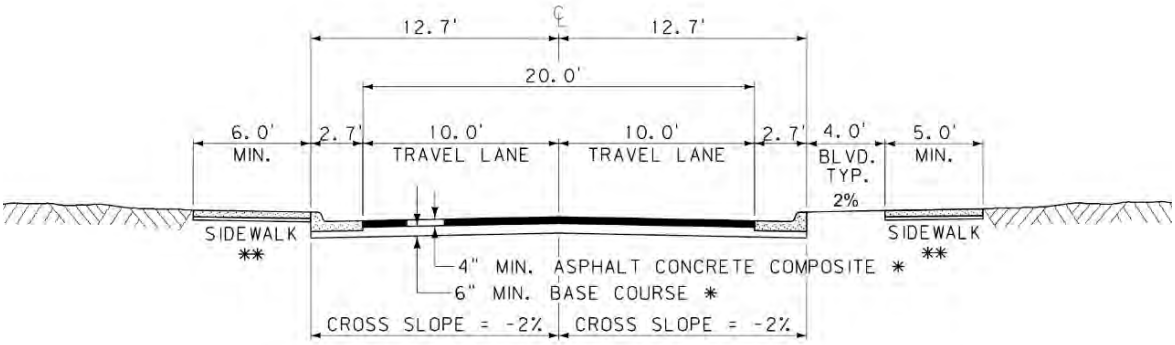


FIGURE 9-4 –Tribal Housing & Residential Street Typical Section - Rural



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

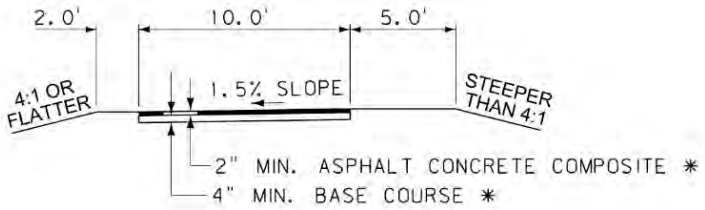
FIGURE 9-5 –Tribal Housing & Residential Street Typical Section - Urban



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

** PAVEMENT SECTION SHALL BE DETERMINED BY LICENSED PROFESSIONAL ENGINEER

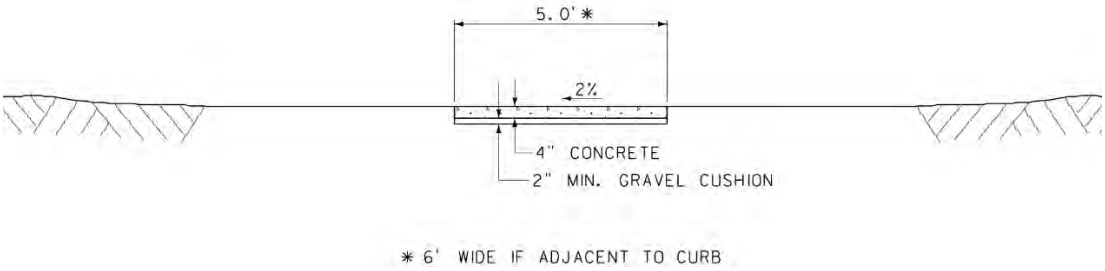
FIGURE 9-6 – Standard Separated Shared Use Path Typical Section



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

* PAVEMENT SECTION SHALL BE DETERMINED BY LICENSED PROFESSIONAL ENGINEER

FIGURE 9-7 – Standard Sidewalk Typical Section



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 AND PROJECTS

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.

The Wounded Knee Massacre Site is a cultural site that draws high tourism throughout the year. The Site is commonly occupied by vendors who sell goods to tourists. However, the vendor locations are poorly defined and separated from the parking lot by a drainage swale that impedes access to the vendors. It is recommended that this condition be improved by installing a boardwalk along the southeast side of the parking lot, and covered vendor pads on stilts to provide ease of access and protection from overland water flow and weather conditions. A planning level estimate for the project is $250,000.

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 LRTP 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.

A gradual change from fossil fuel cars to electric cars is expected to occur over time. It would be in OST's best interest to prepare for this change by installing electric fueling stations at strategic locations on the Reservation.

According to Home Advisor, the 2018 national average cost for installing a standard 240V electric vehicle charging station ranges between $410 and $944.

CHAPTER 10 - 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 FUNDING USE LIMITATIONS

Before providing a description of all the funding programs that are available, it is important to point out that there are requirements that apply to the use of those funds.

Perhaps the three most important requirements for use of transportation funding are:

1. No state or federal funding can be spent on roads or portions of roads, or private driveways that are not part of the RIFDS inventory. Only roads with at least 3 housing units are eligible to go into the NTTFI and RIFDS.
2. No state or federal funding can be spent on any project that is not programmed for funding in the TTIP. Before a project can be programmed in the TTIP, it must be listed in the NTTFI and the LRTP.
3. Maintenance funds used by the RMD are received from the BIA and can only be used on BIA roads. Tribal, County, and private drives are not eligible for use of these funds.

These requirements are outlined in 25 CFR Part 170, and USC Title 23 included in Appendices C and D of this LRTP. Eligible project activities and funding levels are summarized as follows:

ELIGIBLE TTP FUNDED PLANNING AND DESIGN ACTIVITIES

(1) Planning and design of Tribal Transportation Facilities.

(2) Transportation planning activities, including planning for tourism and recreational travel.

(3) Development, establishment, and implementation of Tribal transportation management systems such as safety, bridge, pavement, and congestion management.

(4) Tribal transportation plans and transportation improvement programs (TIPS).

(5) Coordinated technology implementation program (CTIP) projects.

(6) Traffic engineering and studies.

(7) Identification, implementation, and evaluation of data-driven safety needs.

(8) Tribal transportation standards.

(9) Preliminary engineering studies.

(10) Interagency program/project formulation, coordination and review.

(11) Environmental studies and archeological investigations directly related to transportation programs and projects.

(12) Costs associated with obtaining permits and/or complying with Tribal, Federal, State, and local environmental, archeological and natural resources regulations and standards.

(13) Development of natural habitat and wetland conservation and mitigation plans, including plans authorized under the Water Resources Development Act of 1990, 104 Stat. 4604 (Water Resources Development Act).

(14) Architectural and landscape engineering services related to transportation programs.

(15) Engineering design related to transportation programs, including permitting activities.

(16) Inspection of bridges and structures.

(17) Tribal Transportation Assistance Centers (TTACs).

(18) Safety planning, programming, studies and activities.

(19) Tribal employment rights ordinance (TERO) fees.

(20) Purchase or lease of advanced technological devices used for transportation planning and design activities such as global positioning units, portable weigh-in-motion systems, hand-held data collection units, related hardware and software, etc.

(21) Planning, design and coordination for Innovative Readiness Training projects.

(22) Transportation planning and project development activities associated with border crossings on or affecting Tribal lands.

(23) Public meetings and public involvement activities associated with transportation projects and planning.

(24) Leasing or rental of equipment used in transportation planning or design programs.

(25) Transportation-related technology transfer activities and programs.

(26) Educational activities related to bicycle safety.

(27) Planning and design of mitigation impacts to environmental resources caused by a transportation project, including, but not limited to, wildlife, habitat, ecosystems, historic properties, and wetlands.

(28) Evaluation of community impacts such as land use, mobility, access, social, safety, psychological, displacement, economic, and aesthetic impacts.

(29) Acquisition of land and interests in land required for right-of-way, including control of access thereto from adjoining lands, the cost of appraisals, cost of surveys, cost of examination and abstract of title, the cost of certificate of title, advertising costs, and any fees incidental to such acquisition.

(30) Cost associated with relocation activities including financial assistance for displaced businesses or persons and other activities as authorized by law.

(31) On-the-job education including classroom instruction and pre-apprentice training activities related to transportation planning and design.

(32) Other eligible activities as approved by FHWA.

(33) Any additional activities identified by TTP Coordinating Committee guidance and approved by the appropriate Secretaries (see § 170.137).

(34) Indirect general and administrative costs; and

(35) Other eligible activities described in this part.

ELIGIBLE TTP FUNDED CONSTRUCTION & IMPROVEMENT ACTIVITIES

(1) Construction, reconstruction, rehabilitation, resurfacing, restoration, and operational improvements for Tribal transportation facilities.

(2) Construction or improvement of Tribal transportation facilities necessary to accommodate other transportation modes.

(3) Construction of toll roads, highway bridges and tunnels, and toll and non-toll ferry boats and terminal facilities and approaches thereto (except when on the Interstate System) to the extent permitted under 23 U.S.C. 129.

(4) Construction of projects for the elimination of hazards at railway-highway crossings, including the separation or protection of grades at crossings, the reconstruction of existing railroad grade crossing structures, and the relocation of highways to eliminate grade crossings.

(5) Installation of protective devices at railway-highway crossings.

(6) Transit facilities, whether publicly or privately owned, that serve Indian reservations and other communities or that provide access to or are located within an Indian reservation or community (see §§ 170.131 through 170.134 for additional information).

(7) Engineered pavement overlays that add to the structural value and design life or increase the skid resistance of the pavement.

(8) Tribally-owned, post-secondary vocational school transportation facilities.

(9) Road sealing.

(10) The placement of a double bituminous surface and chip seals during the construction of an approved project (as the non-final course) or that form the final surface of low volume roads.

(11) Seismic retrofit, replacement, rehabilitation, and painting of road bridges.

(12) Application of calcium magnesium acetate, sodium acetate/formate, or other environmentally acceptable, minimally corrosive anti-icing and de-icing compositions on road bridges, and approaches thereto and other elevated structures.

(13) Installation of scour countermeasures for road bridges and other elevated structures.

(14) Special pedestrian facilities built in lieu of streets or roads, where standard street or road construction is not feasible.

(15) Standard regulatory, warning, guide, and other official traffic signs, including dual language signs, which comply with the MUTCD that are part of transportation projects. TTP funds may also be used on interpretive signs (signs intended for viewing only by pedestrians, bicyclists, and occupants of vehicles parked out of the flow of traffic) that

are culturally relevant (native language, symbols, etc.) that are a part of transportation projects.

(16) Traffic barriers and bridge rails.

(17) Engineered spot safety improvements.

(18) Planning and development of rest areas, recreational trails, parking areas, sanitary facilities, water facilities, and other facilities that accommodate the traveling public.

(19) Public approach roads and interchange ramps that meet the definition of a Tribal Transportation Facility.

(20) Construction of roadway lighting and traffic signals.

(21) Adjustment or relocation of utilities directly related to roadway work, not required to be paid for by local utility companies.

(22) Conduits crossing under the roadway to accommodate utilities that are part of future development plans.

(23) Restoration of borrow and gravel pits created by projects funded from the TTP.

(24) Force account and day labor work, including materials and equipment rental, being performed in accordance with approved plans and specifications.

(25) Experimental features where there is a planned monitoring and evaluation schedule.

(26) Capital and operating costs for traffic monitoring, management, and control facilities and programs.

(27) Safely accommodating the passage of vehicular and pedestrian traffic through construction zones.

(28) Construction engineering including contract/project administration, inspection, and testing.

(29) Construction of temporary and permanent erosion control, including landscaping and seeding of cuts and embankments.

(30) Landscape and roadside development features.

(31) Marine facilities and terminals as intermodal linkages.

(32) Construction of visitor information centers, kiosks, and related items.

(33) Other appropriate public road facilities such as visitor centers as determined by the Secretary of Transportation.

(34) Facilities adjacent to roadways to separate pedestrians and bicyclists from vehicular traffic for operational safety purposes, or special trails on separate rights-of-way.

(35) Construction of pedestrian walkways and bicycle transportation facilities, such as a new or improved lane, path, or shoulder for use by bicyclists and a traffic control device, shelter, or parking facility for bicycles.

(36) Facilities adjacent to roadways to separate modes of traffic for safety purposes.

(37) Acquisition of scenic easements and scenic or historic sites provided they are part of an approved project or projects.

(38) Debt service on bonds or other debt financing instruments issued to finance TTP construction and project support activities.

(39) Any project to encourage the use of carpools and vanpools, including provision of carpooling opportunities to the elderly and individuals with disabilities, systems for locating potential riders and informing them of carpool opportunities, acquiring vehicles for carpool use, designating existing highway lanes as preferential carpool highway lanes, providing related traffic control devices, and designating existing facilities for use for preferential parking for carpools.

(40) Fringe and corridor parking facilities including access roads, buildings, structures, equipment improvements, and interests in land.

(41) Adjacent public parking areas.

(42) Costs associated with obtaining permits and/or complying with Tribal, Federal, State, and local environmental, archeological, and natural resources regulations and standards on TTP projects.

(43) Seasonal transportation routes, including snowmobile trails, ice roads, overland winter roads, and trail markings. (See § 170.117.)

(44) Tribal fees such as employment taxes (TERO), assessments, licensing fees, permits, and other regulatory fees.

(45) On-the-job education including classroom instruction and pre-apprentice training activities related to TTP construction projects such as equipment operations, surveying, construction monitoring, testing, inspection and project management.

(46) Installation of advance technological devices on TTP transportation facilities such as permanent weigh-in-motion systems, informational signs, intelligent transportation system hardware, etc.

(47) Cultural and environmental resource monitoring, management, and mitigation for transportation related activities

(48) Mitigation activities required by Tribal, State, or Federal regulatory agencies and 42 U.S.C. 4321, et seq., the National Environmental Policy Act (NEPA).

(49) Purchasing, leasing or renting of construction or maintenance equipment. All equipment purchase request submittals must be accompanied by written cost analysis and approved by FHWA or BIA. When purchasing construction or maintenance equipment, a Tribe must:

(i) Construction - Develop a lease/purchase cost analysis that identifies the overall benefit of purchasing the piece of equipment versus leasing. This analysis must be submitted to BIA or FHWA for approval per § 170.113. If approved, the funding must be identified on a FHWA-approved TTIP in order to be expended in accordance with 23 U.S.C. 202(b)(4)(B).

(ii) Maintenance - The equipment costs are considered part of the funding identified in 23 U.S.C. 202(a)(8) and must be identified on a FHWA-approved TTIP in accordance with 23 U.S.C. 202(b)(4)(B) in order to be expended.

(50) Coordination and construction materials for innovative readiness training projects operated by entities such as the Department of Defense (DOD), the American Red Cross, the Federal Emergency Management Agency (FEMA), other cooperating Federal agencies, States and their political subdivisions, Tribal governments, or other appropriate non-governmental organizations.

(51) Emergency repairs on Tribal Transportation Facilities.

(52) Public meetings and public involvement activities.

(53) Construction of roads on dams and levees.

(54) Transportation alternative activities as defined in 23 U.S.C. 101(a).

(55) Modification of public sidewalks adjacent to or within Tribal transportation facilities.

(56) Highway and transit safety infrastructure improvements and hazard eliminations.

(57) Transportation control measures such as employer-based transportation management plans, including incentives, shared-ride services, employer sponsored programs to permit flexible work schedules and other activities, other than clause (xvi) listed in section 108(f)(1)(A) of the Clean Air Act, (42 U.S.C. 7408(f)(1)(A)).

(58) Environmental restoration and pollution abatement activities in order to construct a transportation project or to mitigate impacts caused by a transportation project.

(59) Trail development and related activities as identified in §§ 170.123 through 170.126.

(60) Development of scenic overlooks and information centers.

(61) Natural habitat and wetlands mitigation efforts related to TTP projects, including:

(i) Participation in natural habitat and wetland mitigation banks, including banks authorized under the Water Resources Development Act, and

(ii) Contributions to Tribal, statewide and regional efforts to conserve, restore, enhance, and create natural habitats and wetland, including efforts authorized under the Water Resources Development Act.

(62) Mitigation of damage to wildlife, habitat and ecosystems caused as a result of a transportation project.

(63) Construction of permanent fixed or moveable structures for snow or sand control.

(64) Cultural access roads (see § 170.115).

(65) Other eligible items as approved by the Federal Highway Administration (FHWA).

(66) Any additional activities proposed by a Tribe or the TTP Coordinating Committee and approved by the appropriate Secretaries (see §§ 170.113 and 170.136).

(67) Other eligible activities identified in this part (c) TTP funds can be used for maintenance activities as defined in subpart G of this regulation.

Each of the identified items must be interpreted in a manner that permits, rather than prohibits, a proposed use of funds.

ACTIVITIES NOT ELIGIBLE FOR TTP FUNDING

(1) Structures and erosion protection unrelated to transportation and roadways;

(2) General or Tribal planning not involving transportation;

(3) Landscaping and irrigation systems not involving transportation programs and projects;

(4) Work or activities that are not listed on an FHWA-approved TTPTIP;

(5) Condemnation of land for recreational trails;

(6) Salaries and/or other incidental costs of any Federal employee or contractor not performing Federal TTP stewardship and oversight, work identified in the appendix to subpart E, or project-related activities identified on an approved TTIP; or

(7) Direct and/or incidental costs associated with the Federal Government's acquisition of goods, services, or construction unrelated to the program.

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

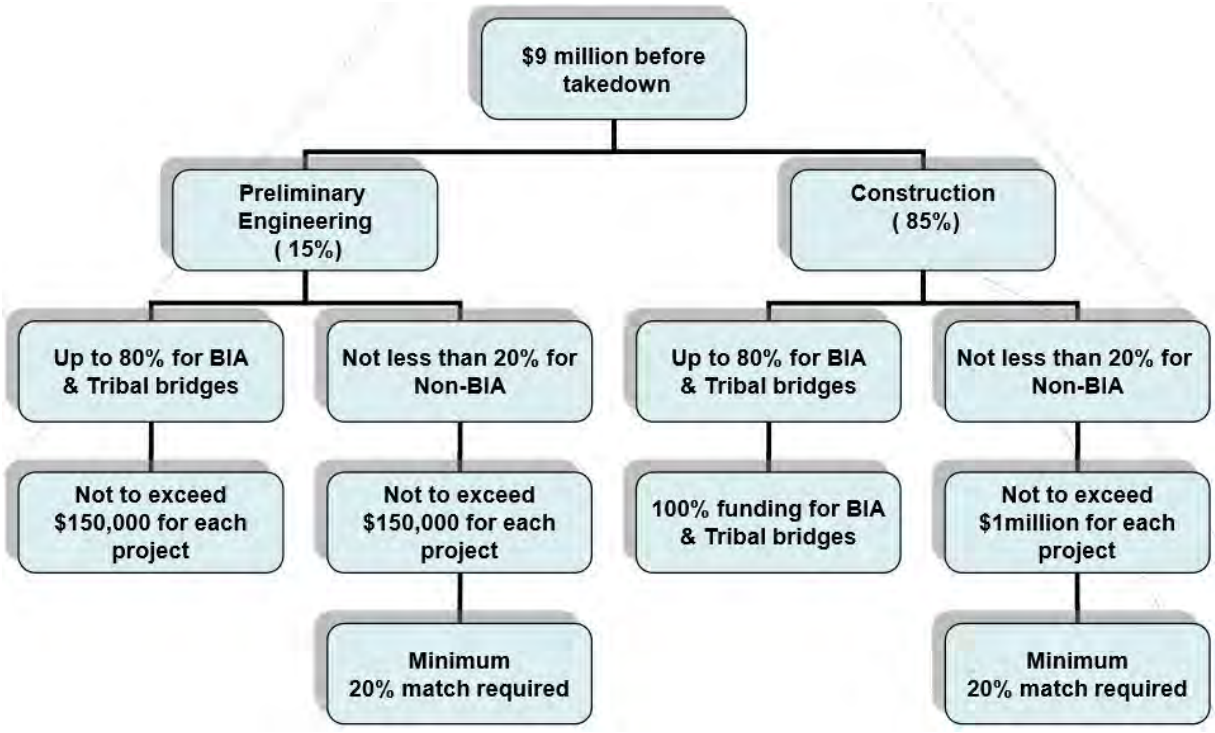
Applications for bridge project funding can be submitted under the Tribal Transportation Bridge Program (TTBP). All projects are ranked and prioritized based on the following criteria:

- 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 10-1 shows the annual Tribal bridge program funding that the OST can compete for on a national level.

FIGURE 10-1 – Annual Tribal Bridge Program Funding



TRANSPORTATION ALTERNATIVE/RECREATION 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 in 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.

SD 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 10-2 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 10-2 – 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 10-3 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 10-4 provides a guide for recommended average costs for possible project improvement strategies. Figure 10-4 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 10-3 – 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 10-4 – 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 Primative 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 11 - 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 11-1. 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 $6.5 million dollars to preserve roads that haven't received a seal coat since 2010-2012. These recommended seal coat projects are shown in Figure 11-2. 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 11-3.

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 11-4. 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 11-1 – Current Short Range Projects

OGLALA 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
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
OST 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 (ERFO)	$ 5,000				
BIA 27 - MP 44.5 - Emergency Pipe Culvert Repair (ERFO)	$ 90,000				
BIA 27 - MP 47.7 - Emergency Pipe Culvert Repair (ERFO)	$ 45,000				
BIA 2 - MP 3.2 Emergency Pipe Culvert Repair (ERFO)	$ 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 - Cuny Table Overlay			$ 5,000,000	$ 2,000,000	$ 2,000,000
BIA 90 - Moccasin Park Bridge A155	$ 60,000		$ 800,000		
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**

FIGURE 11-2 – Recommended Short Range Seal Coat Projects – Tonya is updating

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 11-3 – Recommended Short Projects (2018-2023)

OGLALA SIOUX TRIBE
SUMMARY OF PROJECTS ON TTIP - FY 2018-2023

Project Name	FY 2018	FY 2019	FY 2020	FY 2021	FY2022	FY 2023
Transportation Planning	$ 268,000	$ 225,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000
TTP Program Management and Oversight	$ 314,500	$ 285,000	$ 285,000	$ 285,000	$ 285,000	$ 285,000
Road Maintenance	$ 150,000	$ 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	$ 150,000
Bus Transit Services	$ 100,000	$ 100,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000
OST Bridge Inspections	$ 55,000		$ 60,000		$ 60,000	
Multi-Route Pavement Striping	$ 20,000	$ 330,000	$ 400,000	$ 575,000	$ 400,000	$ 575,000
~~Allen Road - BIA 4 Extension~~	~~$ 4,100,000~~					
BIA 27 - MP 43.8 - Emergency Pipe Culvert Repair (ERFO)	$ 80,000					
~~BIA 27 - MP 44.5 - Emergency Pipe Culvert Repair (ERFO)~~	~~$ 115,800~~					
~~BIA 27 - MP 47.7 - Emergency Pipe Culvert Repair (ERFO)~~	~~$ 27,000~~					
~~BIA 2 - MP 3.2 Emergency Pipe Culvert Repair (ERFO)~~	~~$ 13,000~~					
BIA 41 - N. Reservation Line to 2.4 Miles S. of BIA 2 - Reconstruction	$ 80,000	$ 5,200,000				
~~BIA 2 - Sharps Corner to Kyle - Overlay~~	~~$ 2,720,000~~					
BIA 41 - BIA 32 North to US 18 - Overlay	$ 2,100,000	$ 130,000				
BIA 49 - Wounded Knee Bridge A133	$ 11,000		$ 245,000			
Multi-Route Chip Seal	$ 5,000	$ 3,500,000			$ 3,000,000	
BIA 50 - Oglala Housing Streets		$ 1,700,000				
Various Routes - Culvert Inventory, Inspections, & Rehabilitation		$ 100,000				
BIA 6 - Wooden Bridge A122	$ 3,000	$ 42,000	$ 800,000			
BIA 2 - Cuny Table Overlay				$ 7,000,000		
BIA 30 - Moccasin Park Bridge A155	$ 5,000	$ 55,000	$ 800,000			
BIA 88 - White River Bridge A154	$ 3,000	$ 132,000		$ 1,200,000		$ 542,660
BIA 32 - Pipe Repairs	$ 100,000					
BIA 41 - US 18 to White River - Overlay						$ 1,000,000
BIA 26 - Kyle Cut-Across		$ 65,000				
Kyle Pathway (Partial TA Funding)		$ 535,000				
Kyle Pathway Lighting		$ 28,000	$ 387,000			
Allen Pathway Lighting		$ 23,000	$ 212,000			
Manderson Pathway		$ 500,000	$ 500,000			
SD407 Pathway		$ 80,000			$ 1,000,000	
School Zone Assessment and Implementation (Various Routes)		$ 281,000				
Gravel Pit Exploration	$ 17,000	$ 155,000				
Gravel Pit Development		$ 50,000	$ 50,000	$ 50,000		
Bridge Maintenance		$ 50,000		$ 50,000		
BIA 2 Kyle to SD44	$ 50,000	$ 30,000	$ 100,000	$ 200,000	$ 200,000	
BIA 32 - Pine Ridge to BIA 41 - Spot Reconstruction+ Gravel Shoulders			$ 100,000	$ 1,000,000		
BIA 33 - MP5.5 Culvert Replacement				$ 270,000		
BIA 33/28 - Overlay BIA 14 to North				$ 1,000,000	$ 2,500,000	$ 3,162,536
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
TOTAL PROPOSED EXPENDITURES	**$10,837,300**	**$14,486,000**	**$ 4,614,000**	**$12,285,000**	**$8,100,000**	**$ 6,220,196**
FUNDING						
FUNDS CARRIED OVER FROM PREVIOUS YEAR	$ 10,053,752	$ 7,409,136	$ 1,614,136	$ 6,345,136	$ 2,320,136	$ 220,136
ESTIMATED TTP FUNDS (BASED ON PREVIOUS 2018 FUNDING)	$ 6,894,088	$ 6,890,000	$ 7,100,000	$ 6,000,000	$ 6,000,000	$ 6,000,000
OGLALA HOUSING ?		$ 300,000				
TTP BRIDGE FUNDING - INSPECTIONS		$ 60,000		$ 60,000		
TTP BRIDGE FUNDING PROPOSALS			$ 1,845,000	$ 1,200,000		
BIA 638 CONTRACT GRANT FOR MINING AND MINERAL	$ 114,000					
ERFO FUND REIMBURSEMENT	$ 784,656					
SDDOT TA FUNDING GRANT	$ 400,000	$ 400,000	$ 400,000			
TTP SAFETY FUNDS PLANNED REQUEST		$ 1,041,000		$ 1,000,000		
TOTAL AVAILABLE FUNDS	**$18,246,496**	**$ 16,100,196**	**$10,359,196**	**$ 14,605,196**	**$8,320,196**	**$ 6,220,196**
FUNDS CARRIED FORWARD	$ 7,409,136	$ 1,614,196	$ 6,345,136	$ 2,320,196	$ 220,136	0
REV. 8/30/2018 - Amounts in red denote potential grant funding						

Crossed out projects represent those to be completed by the end of FY 2018.

FIGURE 11-4 – 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
	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
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
	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
Misc.	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
	Garnier Road	1.8	-	-	Blade and Gravel	$ 10,000.00	Gravel and Route upgrades
Misc.	Other Paved BIA and Tribal Roads*	271	-	-	Varied Paving	$ 219,624,179.00	Cross Section and Surfacing*
Misc.	Other BIA and Tribal Earth/Dirt Roads**	1179	-	-	Blade, Gravel, Drainage	$ 815,133,200.00	Cross Section and Surfacing**
Misc.	Wounded Knee Boardwalk	-	-	-	New Construction	$ 250,000.00	Boardwalk and Vendor Pads
Misc.	Wind Farm Route Improvements	-	-	-	New Construction	$ 30,000,000.00	Road, structural and drainage
*See Appendix K	**See Appendix J				Total	$ 1,165,191,129.00	

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.
- Update traffic count data throughout the Reservation.

FISCAL YEAR 2018 RIFDS INVENTORY

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

