Navajo Division of Transportation (NDOT)

Pavement Management System Plan (PMSP)

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PREPARED FOR

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Executive Summary

This document consists of a proposed Pavement Management System Plan (PMSP) for the Navajo Division of Transportation (NDOT). Wilson & Company and Woodson Engineering have prepared this document through an on-call contract task order per the NDOT's request. The PMSP will focus on recommendations and processes for NDOT to assess, manage and maintain the paved (asphalt or chip seal) roads within their system. The PMSP is intended to provide NDOT Executive Staff with a systematic process for evaluating and providing data driven maintenance projects that can be considered for future fiscal year TTP funding.

In 2016, the Navajo DOT and Wilson & Company completed an update to the Navajo Nation Long Range Transportation Plan (LRTP) where one of the top goals was to "Take Care of the System". In order to meet this LRTP goal, NDOT TTP funding cannot be solely dedicated to building new roadways or upgrading dirt roads to paved roadways. The Navajo DOT needs to dedicate TTP funding for pavement maintenance projects as well.

Based on the 2015 RIFDs data, the current roadway system network contains approximately 1612 miles of paved roadway. The BIA has historically completed all maintenance on the paved Navajo Nation roads. They receive an annual budget of approximately $6.1M of Department of the Interior-Tribal Priority Allocations (DOI-TPA) funding to perform maintenance on their 6,000 miles of roadway. The BIA indicated that a large portion of this funding is used for Navajo Nation requests to blade/grade dirt roads with a small amount related to addressing emergency weather conditions. The unpaved roadway maintenance portion does not leave a lot of funding leftover for paved roadway maintenance. According to the BIA's FY 2017/FY 2018 Deferred Maintenance Assessment for Roads (DMR), they have approximately $14 to $16 million in overall roadway maintenance needs and spent approximately $1.7 million (FY 2017) and $1.0 million (FY 2018) on the paved roads during these years.

According to the CFR and the Navajo Nation/FHWA Funding agreement, NDOT can spend up to 25% of their TTP funds on maintenance activities. Using this limitation and the current funding amount, NDOT can spend approximately $8.25 million per year of their TTP funding on paved roadway maintenance activities and still operate their Roads Department, dirt roadway maintenance programs as it is currently funded. This federal funding limitation indicates that NDOT will need to supplement some of these projects with FET or PTF funding as approved by the RDC.

The data available for this PMSP Report was taken from two main sources, the NDOT Planning Department's 2015 RIFDs database and the BIA's Quarterly DMR Reports for FY 2017 (Quarter 1-4). The BIA FY 2018 reports were not available at the time of completing this work. The results of the process as described in Chapter 3 are only as good as the data. The field reviews noted that several of the PCI values in the database were not correct which would indicate that the steps to refine/reduce the project list are most likely not 100% accurate. The acronym PCI stands for Pavement Condition Index and is rated on a number system from 0-100. There are most likely several other roadways within the Navajo Nation that are paved and meet the selection criteria for preventative maintenance.

The types of pavement maintenance treatments can be categorized into **Routine Maintenance (PCI 80-100)** and **Preventive Maintenance (PCI 30-79)**. For the purposes of this PMSP, the selection of projects

fell within the preventative maintenance category. This was done based on the extremely large number of miles in this category and the limitation of funding as previously described. Preventive maintenance is a strategy of extending the service life by applying cost-effective treatments to the surface or near surface of structurally sound pavements. Examples of preventive treatments include asphalt crack sealing, chip sealing, slurry or micro-surfacing, thin and ultra-thin hot-mix asphalt overlay, and isolated, partial and/or full-depth repairs. On the Navajo Nation system, preventive maintenance normally consists of crack sealing, pothole repair, patching, chip seals, flush coats, and in some cases 2" overlays or 2" mill and fill type projects.

Extensive research of developing a PMSP was conducted as part of the report. Interviews with the City of Rio Rancho (NM), the BIA and the New Mexico Division of Transportation (NMDOT) were conducted to understand their processes and get their input on what would work best for NDOT. The steps in developing a PMSP can be summarized in seven steps as shown below.

- Step 1: Defining the network & collect data
- Step 2: Collection of condition data (current and future)
- Step 3: Predicting pavement condition
- Step 4: Selecting treatments
- Step 5: Reporting results
- Step 6: Select a pavement management tool
- Step 7: Keep the process current

The PMSP herein can be considered as a section or portion of NDOT's overall asset management plan for the transportation infrastructure that NDOT is responsible for.

Knowing that the current pavement data and roadway information is limited and possibly inaccurately coded in some of the RIFDs rows, the pavement maintenance priority process had to be simplified for this FY report's recommendations. Below is a simple step-by-step process in which the existing RIFDs data was prioritized to determine the NDOT roadway system potential maintenance projects.

- Step 1: Reduce Data Set
- Step 2: Sort Existing Data Set
- Step 3: Eliminate Roads that fall beyond Maintenance or require NO Maintenance at this time
- Step 4: Resort the Data using Road Name/ADT Counts. Select preferred Routes using the BIA DMR data.
- Step 5: Apply the Proposed Mitigation Treatments and Costs to the Preferred Road Segments
- Step 6: Review of Proposed Roadway projects with NDOT and BIA Staff to determine final list for FY 2019 and FY 2020

Step 4 was completed in an effort to support the BIA's pavement maintenance needs, the goal of the NDOT maintenance program would be to support the BIA's Deferred Maintenance needs. Implementing projects on the BIA roadway system at this time helps them improve their Level of Service evaluation criteria and reduces the DMR funding needed.

Step 5 entailed determining and applying appropriate mitigation treatments and costs. In order to effectively understand the pavement conditions and determine the appropriate mitigation, a field review of each project corridor was conducted. The field review consisted of driving the project length,

taking photos and documenting the current condition of the pavement. The results of these field reviews are contained in Appendix A of the report.

Tables 5 & 6 and Figure 11 at the end of the report represents the results of Steps 1 to 6 and the proposed pavement maintenance projects that NDOT should consider for FY 2019/FY 2020 and beyond. The projects were given a priority ranking based on the following guidelines:

- Bus routes – projects that were bus routes had higher priority.
- BIA Level of Service Code – projects having a Level of Service code of *5-Failing* had higher priority than the ones with *4-Poor* and *3-Fair* ratings.
- ADT count – the higher ADT counts had higher priority.

Recommendations: Based on the information provided, the interviews conducted and the field reviews completed, Wilson & Company recommends that the following items be reviewed and considered by NDOT for implementation.

- Dedicate approximately $8.25 - $9.0 million of TTP funding per fiscal year to the preservation and maintenance of existing paved roadways within the NDOT and BIA system.
    - The dedication of this funding also meets the #1 Navajo Nation LRTP goal of *Take Care of the System*.
    - Based on the length of the roads and the current state of disrepair they are in, several of the proposed pavement maintenance projects will require more funding than what is available in a fiscal year. This will require NDOT to dedicate additional funding from other sources to complete them.
- Implement the proposed mitigation/maintenance activities as described in Tables 5 & 6. The tables provide a priority ranking and potential fiscal year for implementation based on the funding amounts available. The projects will essentially utilize the TTP maintenance funding for FY 2019-2025.
    - It should be noted that the existing pavement conditions and priorities of these projects may change over the years as each roadway may deteriorate differently based on location, weather and traffic use.
    - Several additional project corridors were identified by BIA and NDOT staff while this report was being prepared. Two additional corridors (N15 and N474) were field reviewed and included in the ranking.
- NDOT should consider implementing a full PMSP based on the Steps in Chapter 2. The steps completed as part of this report are described in Chapter 3 and can be considered an extremely simplified version of a fully developed PMSP.
- Develop and maintain a process of collecting paved roadway existing conditions data that becomes the basis of the future pavement maintenance selection process.
- NDOT should consider purchasing equipment and training individuals in the Roads Department on how to perform some of the pavement mitigation activities (specifically crack sealing, patching and applying seal coats) along with a pavement marking/striping machine. These activities are crucial in extending the pavement lifespan and preventing further water infiltration and subgrade damage/failures.

Chapter 1 - Introduction and Program

1.1. Background

This document consists of a proposed Pavement Management System Plan (PMSP) for the Navajo Division of Transportation (NDOT). Wilson & Company and Woodson Engineering have prepared this document through an on-call contract task order per the NDOT's request. We would like to thank the following agencies for their input and cooperation: Bureau of Indian Affairs (BIA), City of Rio Rancho (CORR) and the New Mexico Department of Transportation (NMDOT). The PMSP will focus on recommendations and processes for NDOT to assess, manage and maintain the paved (asphalt or chip seal) roads within their system. The PMSP is intended to provide NDOT Executive Staff with a systematic process for evaluating and providing data driven maintenance projects that can be considered for future fiscal year TTP funding. The evaluation methods and recommendations contained within this PMSP are based on the current RIFDs data provided by the NDOT Planning Department. This data was found to be incorrect at many locations which can potentially skew the results of the selected projects. Recommendations are also provided as to future actions that NDOT should consider to improve their data collection and the overall PMSP effectiveness.

In 2016, the Navajo DOT and Wilson & Company completed an update to the Navajo Nation Long Range Transportation Plan (LRTP). This LRTP was reviewed and approved by FHWA and the Navajo Nation Resource Development Committee (RDC). One of the top goals identified in the LRTP was to "Take Care of the System". In order to monitor progress in doing this, the LRTP has identified specific measures that will be updated on an annual basis. In the Paved Roads category, the monitoring will entail reporting on the PCI values and the number of miles of road for the following values. PCI stands for Pavement Condition Index and is rated on a number system from 0-100.

- Paved Roads:
    - Miles of paved roads with a PCI greater than 85;
    - Miles of paved roads with a PCI greater than 85 that were surface treated/preserved in the prior year;
    - Miles of paved roads with a PCI between 70 and 84;
    - Miles of paved roads with a PCI between 70 and 84 that were surface treated/preserved in the prior year;
    - Miles of paved roads with a PCI between 55 and 69;
    - Miles of paved roads with a PCI between 55 and 69 that were surface treated/preserved/rehabilitated in the prior year;
    - Miles of paved road with a PCI of less than 55; and
    - Miles of paved roads with a PCI of less than 55 and rehabilitated in the previous year.

In order to meet this LRTP goal, NDOT TTP funding cannot be solely dedicated to building new roadways or upgrading dirt roads to paved roadways. The Navajo DOT needs to dedicate TTP funding for pavement maintenance projects as well. This PMSP is being developed to assist NDOT Executive staff in making decisions on what type of maintenance projects are needed and what years it will be the most cost-effective to implement them in.

Based on the 2015 RIFDs data, below is a summary of the current roadway system network. These numbers do not include state or county roadways (approximately 3400 miles) within the Navajo Nation.

	TOTAL MILES	PAVED	DIRT
BIA	6,000	1,500	4,500
NDOT	5,000	112	4,888

The PMSP will focus on the 1,612 miles of paved roadway in the Navajo Nation that are the responsibility of the BIA and NDOT.

1.2. Program Requirements

The Navajo DOT utilizes Federal TTP funding to run their current maintenance program. Based on this type of funding, the following program requirements must be followed. Sections of the following CFR requirements that specifically pertain to the PMSP have been highlighted.

Title 23: Highways
PART 973—MANAGEMENT SYSTEMS PERTAINING TO THE BUREAU OF INDIAN AFFAIRS AND THE INDIAN RESERVATION ROADS PROGRAM
Subpart B—Bureau of Indian Affairs Management Systems

§973.204 Management systems requirements.

(a) The BIA, in consultation with the tribes, shall develop, establish and implement nationwide pavement, bridge, and safety management systems for federally and tribally owned IRRs. The BIA may tailor the nationwide management systems to meet the agency's goals, policies, and needs, after considering the input from the tribes, and using professional engineering and planning judgment to determine the required nature and extent of systems coverage consistent with the intent and requirements of this rule.

(b) The BIA and the FHWA, in consultation with the tribes, shall develop an implementation plan for each of the nationwide management systems. These plans will include, but are not limited to, the following: Overall goals and policies concerning the nationwide management systems, each agency's responsibilities for developing and implementing the nationwide management systems, implementation schedule, data sources, including the need to accommodate State and local data, and cost estimate.

(c) Indian tribes may develop, establish, and implement tribal management systems under a self-determination contract or self-governance annual funding agreement. The tribe may tailor the management systems to meet its goals, policies, and needs, using professional engineering and planning judgment to determine the required nature and extent of systems coverage consistent with the intent and requirements of this rule.

(d) The BIA, in consultation with the tribes, shall develop criteria for cases in which tribal management systems are not appropriate.

(e) The BIA, in consultation with the tribes, or the tribes under a self-determination contract or self-governance annual funding agreement, may incorporate data provided by States and local governments into the nationwide or tribal management systems, as appropriate, for State and locally owned IRRs.

(f) The BIA, in consultation with the tribes, shall develop and implement procedures for the development, establishment, implementation and operation of nationwide management systems. If a tribe develops tribal management systems, the tribe shall

develop and implement procedures for the development, establishment, implementation and operation of tribal management systems. The procedures shall include:

(1) A description of each management system;

(2) A process to operate and maintain the management systems and their associated databases;

(3) A process for data collection, processing, analysis and updating for each management system;

(4) A process for ensuring the results of the management systems are considered in the development of IRR transportation plans and transportation improvement programs and in making project selection decisions under 23 U.S.C. 204; and

(5) A process for the analysis and coordination of all management systems outputs to systematically operate, maintain, and upgrade existing transportation assets cost-effectively;

(g) All management systems shall use databases with a common or coordinated reference system that can be used to geolocate all database information.

(h) Existing data sources may be used by the BIA and the tribes to the maximum extent possible to meet the management system requirements.

(i) A nationwide congestion management system is not required. The BIA and the FHWA, in consultation with the tribes, shall develop criteria for determining when congestion management systems are required for BIA or tribal transportation facilities providing access to and within the Indian reservations. Either the tribes or the BIA, in consultation with the tribes, shall develop, establish and implement congestion management systems for the transportation facilities that meet the criteria.

(j) The BIA shall develop an appropriate means to evaluate the effectiveness of the nationwide management systems in enhancing transportation investment decisions and improving the overall efficiency of the affected transportation systems and facilities. This evaluation is to be conducted periodically, preferably as part of the BIA planning process to assist the FHWA in evaluating the efficiency and effectiveness of the management systems as a component of the IRR program, and may include consultation with the tribes, as appropriate.

(k) The management systems shall be operated so investment decisions based on management system outputs can be accomplished at the BIA region and tribal level and can be utilized throughout the transportation planning process.

§973.206 Funds for establishment, development, and implementation of the systems.

The IRR program management funds may be used to accomplish nationwide management system activities. For tribal management system activities, the IRR two percent tribal transportation planning or construction funds may be used. (Refer to 23 U.S.C. 204(b) and 204(j)). These funds are to be administered in accordance with the procedures and requirements applicable to the funds.

§973.208 Indian lands pavement management system (PMS).

In addition to the requirements provided in §973.204, the PMS must meet the following requirements:

(a) The BIA shall have PMS coverage for all federally and tribally owned, paved IRRs included in the IRR inventory.

(b) Where a tribe collects data for the tribe's PMS, the tribe shall provide the data to the BIA to be used in the nationwide PMS.

(c) The nationwide and tribal PMSs may be based on the concepts described in the AASHTO's "Pavement Management Guide."[1]

[1]"Pavement Management Guide," AASHTO, 2001, is available for inspection as prescribed at 49 CFR part 7. It is also available from the American Association of State Highway and Transportation Officials (AASHTO), Publication Order Dept., P.O. Box 96716, Washington, DC 20090-6716 or online at http://www.transportation.org/publications/bookstore.nsf.

(d) The nationwide and tribal PMSs may be utilized at various levels of technical complexity depending on the nature of the pavement network. These different levels may depend on mileage, functional classes, volumes, loading, usage, surface type, or other criteria the BIA and ITGs deem appropriate.

(e) A PMS shall be designed to fit the BIA's or tribes' goals, policies, criteria, and needs using the following components, at a minimum, as a basic framework for a PMS:

(1) A database and an ongoing program for the collection and maintenance of the inventory, inspection, cost, and supplemental data needed to support the PMS. The minimum PMS database shall include:

(i) An inventory of the physical pavement features including the number of lanes, length, width, surface type, functional classification, and shoulder information;

(ii) A history of project dates and types of construction, reconstruction, rehabilitation, and preventive maintenance. If some of the inventory or historic data is difficult to establish, it may be collected when preservation or reconstruction work is performed;

(iii) A condition survey that includes ride, distress, rutting, and surface friction (as appropriate);

(iv) Traffic information including volumes and vehicle classification (as appropriate); and

(v) Data for estimating the costs of actions.

(2) A system for applying network level analytical procedures that are capable of analyzing data for all federally and tribally owned IRR in the inventory or any subset. The minimum analyses shall include:

(i) A pavement condition analysis that includes ride, distress, rutting, and surface friction (as appropriate);

(ii) A pavement performance analysis that includes present and predicted performance and an estimate of the remaining service life (performance and remaining service life to be developed with time); and

(iii) An investment analysis that:

(A) Identifies alternative strategies to improve pavement conditions;

(B) Estimates costs of any pavement improvement strategy;

(C) Determines maintenance, repair, and rehabilitation strategies for pavements using life cycle cost analysis or a comparable procedure;

(D) Performs short and long term budget forecasting; and

(E) Recommends optimal allocation of limited funds by developing a prioritized list of candidate projects over a predefined planning horizon (both short and long term).

(f) For any roads in the inventory or subset thereof, PMS reporting requirements shall include, but are not limited to, percentage of roads in good, fair, and poor condition.

Title 25: Indians
PART 170—TRIBAL TRANSPORTATION PROGRAM

Subpart G—Maintenance

§170.800 What funds are available for maintenance activities?

(a) Under 23 U.S.C. 202(a)(8), a Tribe can use TTP funding for maintenance, within the following limits, whichever is greater:

(1) 25 percent of its TTP funds; or

(2) $500,000.

(b) These funds can only be used to maintain the public facilities included in the NTTFI.

(c) Road sealing activities are not subject to this limitation.

(d) BIA retains primary responsibility, including annual funding request responsibility, for BIA road maintenance programs on Indian reservations.

(e) The Secretary shall ensure that funding made available under the TTP for maintenance of Tribal transportation facilities for each fiscal year is supplementary to, and not in lieu of, any obligation of funds by the BIA for road maintenance programs on Indian reservations.

§170.801 Can TTP funds designated on an FHWA-approved TTIP for maintenance be used to improve TTP transportation facilities?

No. The funds identified for maintenance on a FHWA-approved TTIP cannot be used to improve roads or other TTP transportation facilities to a higher road classification, standard or capacity.

§170.802 Can a Tribe perform road maintenance?

Yes. A Tribe may enter into self-determination contracts, self-governance agreements, program agreements, and other appropriate agreements to perform Tribal transportation facility maintenance.

§170.803 To what standards must a Tribal transportation facility be maintained?

Subject to availability of funding, Tribal transportation facilities must be maintained under either:

(a) A standard accepted by BIA or FHWA (as identified in the official Tribal Transportation Program guide on either the BIA transportation Web site at http://www.bia.gov/WhoWeAre/BIA/OIS/Transportation/index.htm or the Federal Lands Highway—Tribal Transportation Program Web site at http://flh.fhwa.dot.gov/programs/ttp/guide/), or

(b) Another Tribal, Federal, State, or local government maintenance standard negotiated in an ISDEAA road maintenance self-determination contract or self-governance agreement.

§170.804 Who should be contacted if a Tribal transportation facility is not being maintained to TTP standards due to insufficient funding?

The Tribe may notify BIA or FHWA if the Tribe believes that a facility on the NTTFI is not being adequately maintained to the standards identified in §170.803. If BIA or FHWA determines that a Tribal transportation facility is not being maintained, it will:

(a) Notify the facility owner;

(b) Provide a draft copy of the report to the affected Tribe for comment before forwarding it to Secretary of Transportation; and

(c) Report these findings to the appropriate office within FHWA.

§170.805 What maintenance activities are eligible for TTP funding?

TTP maintenance funding support a wide variety of activities necessary to maintain facilities identified in the NTTFI. A list of eligible activities is shown in the appendix to this part.

Appendix to Subpart G—List of Eligible Maintenance Activities Under the Tribal Transportation Program

The following maintenance activities are eligible for funding under the TTP. The list is not all-inclusive.

1. Cleaning and repairing ditches and culverts.

2. Stabilizing, removing, and controlling slides, drift sand, mud, ice, snow, and other impediments.

3. Adding additional culverts to prevent roadway and adjoining property damage.

4. Repairing, replacing or installing traffic control devices, guardrails and other features necessary to control traffic and protect the road and the traveling public.

5. Removing roadway hazards.

6. Repairing or developing stable road embankments.

7. Repairing parking facilities and appurtenances such as striping, lights, curbs, etc.

8. Repairing transit facilities and appurtenances such as bus shelters, striping, sidewalks, etc.

9. Training maintenance personnel.

10. Administering the BIA transportation facility maintenance program.

11. Performing environmental/archeological mitigation associated with transportation facility maintenance.

12. Leasing, renting, or purchasing of maintenance equipment.

13. Paying utilities cost for roadway lighting and traffic signals.

14. Purchasing maintenance materials.

15. Developing, implementing, and maintaining a BIA Transportation Facility Maintenance Management System (TFMMS).

16. Performing pavement maintenance such as pot hole patching, crack sealing, chip sealing, surface rejuvenation, and thin overlays (less than 1 inch).

17. Performing erosion control.

18. Controlling roadway dust.

19. Re-graveling roads.

20. Controlling vegetation through mowing, noxious weed control, trimming, etc.

21. Making bridge repairs.

22. Paying the cost of closing transportation facilities due to safety or other concerns.

23. Maintaining airport runways, heliport pads, and their public access roads.

24. Maintaining and operating BIA public ferry boats.

25. Making highway alignment changes for safety reasons. These changes require prior notice to the Secretary.

26. Making temporary highway alignment or relocation changes for emergency reasons.

27. Maintaining other TTP intermodal transportation facilities provided that there is a properly executed agreement with the owning public authority within available funding.

1.3. BIA Maintenance

The BIA has historically completed all maintenance on the paved Navajo Nation roads. They receive an annual budget of approximately $6.1M of Department of the Interior-Tribal Priority Allocations (DOI-TPA) funding to perform maintenance on their 6,000 miles of roadway. This funding is based on federal funding formulas and remains fairly consistent. The BIA indicated that a large portion of this funding is used for Navajo Nation requests to blade/grade dirt roads with a small amount related to addressing emergency weather conditions. The unpaved roadway maintenance portion does not leave a lot of funding leftover for paved roadway maintenance.

In discussing the source of the BIA maintenance funding (DOI-TPA) and whether or not it will change, BIA and NDOT both indicated that the new FHWA/NDOT direct funding agreement does not affect the DOI-TPA funding and there is no way of diverting this funding over to NDOT for them to manage. The BIA maintenance program will continue to function as it does today. For the purposes of this PMSP, we are simply trying to get an understanding of the current BIA paved maintenance system and the amount of funding they use for it.

In an effort to try and understand how much BIA funding is being spent on maintaining paved roadways, Wilson & Company utilized the FY 2017/FY2018 Deferred Maintenance Assessment for Roads reports (DMR) and added up the Maintenance Performed $$ amounts for Quarters 1-4. The roadway segments listed as *5-Bitumenous > 2"* and *4 - Bitumenous < 2"* for the Surface Type Code were isolated and the maintenance amounts totaled up to get the FY 2017/2018 amounts. Per the DMR, the BIA spent approximately $1.7 million (FY 2017) and $1.0 million (FY 2018) on the Type 4 & 5 roadways.

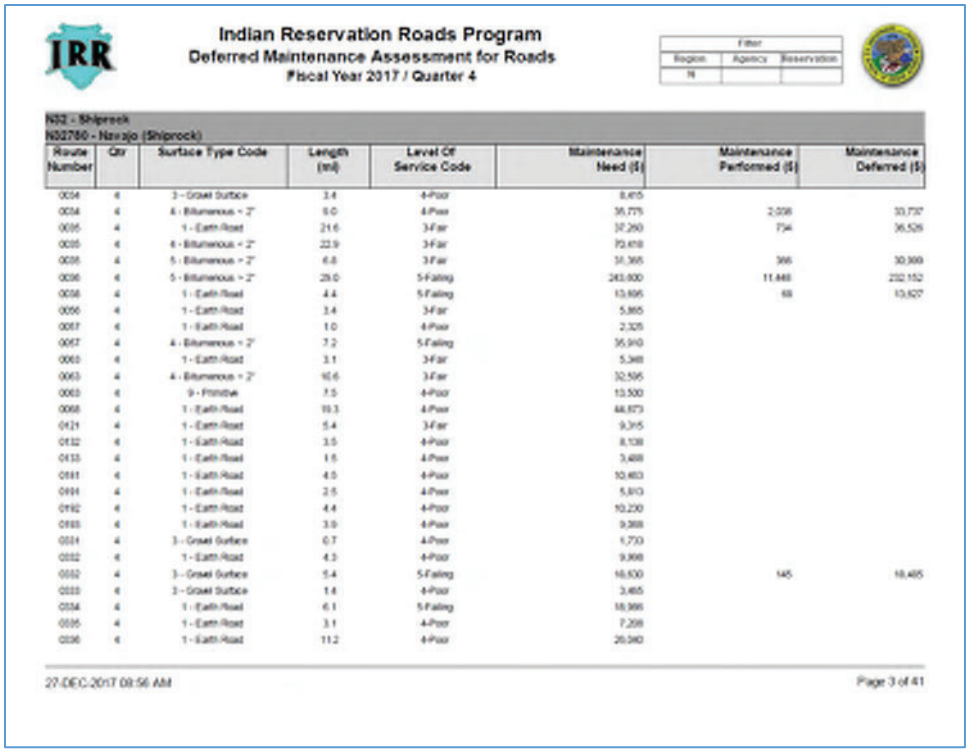
Surface Type Code 4 was noted to include any roadways that have been chip-sealed. The DMR $$ amounts include all costs required to bring a road up to a *level of service 2 - good*. The BIA developed a Surface Condition Rating Guide for field staff to evaluate road conditions. The level of service code varies from (1-5) with “1” being excellent and “5” indicating a failing roadway.

BIA Deferred Maintenance Assessment for Road Maintenance Need ($) Amounts		
	FY 2017	FY 2018
BIA DMR Quarter 1	$14,823,741	$15,133,257
BIA DMR Quarter 2	$14,823,403	$15,345,741
BIA DMR Quarter 3	$14,820,568	$15,345,741
BIA DMR Quarter 4	$15,243,834	$15,923,999

It should be noted that the $$ amounts in the DMR above are not just pavement, but are the total project (labor and materials) costs to complete field reviews or complete any type of maintenance on the roadway features (i.e. fence mending, bridge repairs, shoulder grading, guardrail/sign replacement or drainage structure cleaning).

As part of the research for the PMSP, Wilson & Company interviewed several BIA staff to help understand the current process for managing and completing their pavement maintenance. The following are the basic steps to this process:

1. On an annual basis, the BIA Regional Engineer/Maintenance staff reviews each of the roadways in their region to determine what is necessary to complete so far as maintenance. As noted above, this maintenance need amount is based on improving the entire roadway up to a *level of service 2 – good* based on their rating system.
    a. An example spreadsheet to determine these costs was provided and is included in Appendix B.
2. When maintenance is completed by the BIA, the staff doing the work will complete worksheets documenting their time and materials expended on a particular corridor for that day. These worksheets get processed by the administrative staff and the cost to complete gets added into the Maintenance Performed section of the DMR for the appropriate quarter.
3. At the end of each fiscal quarter, the BIA provides a DMR summary report (See Figure 1 for an example DMR page and Appendix B for the entire 4th Quarter FY 2017 DMR). The DMR summarizes all the costs completed during that quarter and the remaining amount of funds required (called Maintenance Deferred) to finish the effort.
4. When major maintenance projects are completed on a particular roadway section, the BIA Regional Engineer will update the level of service code and revise the Maintenance Need column in the DMR. The smaller maintenance tasks may or may not actually improve the roadways overall level of service code when completed or reduce the Maintenance Need amount shown on the DMR.
5. During interviews, the BIA did not indicate there was a prescribed rating system to determine which maintenance projects got completed first or if the overall roadway system/budget was being evaluated to determine the most cost effective projects.



Indian Reservation Roads Program
Deferred Maintenance Assessment for Roads
Fiscal Year 2017 / Quarter 4

N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0034	4	3 - Gravel Surface	3.4	4-Poor	8,415		
0034	4	4 - Bituminous < 2"	9.0	4-Poor	35,775	2,038	33,737
0035	4	1 - Earth Road	21.6	3-Fair	37,260	734	36,526
0035	4	4 - Bituminous < 2"	22.9	3-Fair	72,418		
0035	4	5 - Bituminous < 2"	6.8	3-Fair	31,365	366	30,999
0036	4	5 - Bituminous < 2"	29.0	5-Failing	243,600	11,448	232,152
0038	4	1 - Earth Road	4.4	5-Failing	13,695	68	13,627
0056	4	1 - Earth Road	3.4	3-Fair	5,865		
0057	4	1 - Earth Road	1.0	4-Poor	2,325		
0057	4	4 - Bituminous < 2"	7.2	5-Failing	35,910		
0060	4	1 - Earth Road	3.1	3-Fair	5,348		
0063	4	4 - Bituminous < 2"	10.6	3-Fair	32,595		
0063	4	9 - Primitive	7.5	4-Poor	13,500		
0068	4	1 - Earth Road	19.3	4-Poor	44,873		
0121	4	1 - Earth Road	5.4	3-Fair	9,315		
0132	4	1 - Earth Road	3.5	4-Poor	8,138		
0133	4	1 - Earth Road	1.5	4-Poor	3,488		
0161	4	1 - Earth Road	4.5	4-Poor	10,463		
0161	4	1 - Earth Road	2.5	4-Poor	5,813		
0162	4	1 - Earth Road	4.4	4-Poor	10,230		
0163	4	1 - Earth Road	3.9	4-Poor	9,068		
0331	4	3 - Gravel Surface	0.7	4-Poor	1,733		
0332	4	1 - Earth Road	4.3	4-Poor	9,998		
0332	4	3 - Gravel Surface	5.4	5-Failing	18,630	145	18,485
0333	4	3 - Gravel Surface	1.4	4-Poor	3,465		
0334	4	1 - Earth Road	6.1	5-Failing	16,366		
0335	4	1 - Earth Road	3.1	4-Poor	7,208		
0336	4	1 - Earth Road	11.2	4-Poor	26,040		

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Figure 1 – Sample DMR page from 4th Quarter of FY 2017

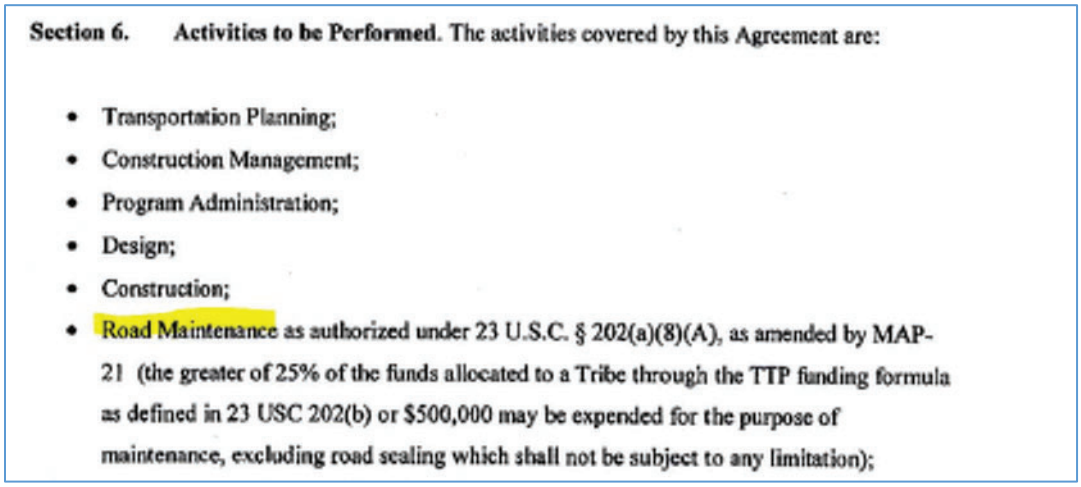
Recommendation: Since the overall BIA maintenance program will remain the same and the DOI-TPA funding will remain in their control, the NDOT PMSP maintenance project recommendations will need to be coordinated with the BIA on a quarterly basis. In an effort to utilize funding to its highest potential, the NDOT PMSP will assign pavement maintenance activities to the BIA in which they already have existing equipment and labor skill sets to complete. NDOT and BIA will have to coordinate the completion of maintenance activities with each other so the independent management systems can be updated appropriately.

1.4. Funding

As discussed in the previous section, the BIA has historically completed all maintenance on the paved Navajo Nation roads. They receive an annual budget of approximately $6.1M of DOI-TPA funding to perform maintenance on the Navajo Nation's 6,000 miles of roadway. This funding is based on federal funding formulas and remains fairly consistent.

NDOT has a direct funding agreement with FHWA and receives approximately $55M annually. According to CFR 25, Subpart G, Section 170.800(a), a Tribe can use 25% of its TTP funds for maintenance. This percentage is confirmed in the Navajo Nation/FHWA Funding Agreement as shown in Figure 2 below. It should be noted that the CFR does not include road sealing activities in this limitation.

- NDOT's TTP funding = $55M
- 25% of $55M = $13.75M = maintenance limit for TTP funding



Section 6. Activities to be Performed. The activities covered by this Agreement are:

- Transportation Planning;
- Construction Management;
- Program Administration;
- Design;
- Construction;
- Road Maintenance as authorized under 23 U.S.C. § 202(a)(8)(A), as amended by MAP-21 (the greater of 25% of the funds allocated to a Tribe through the TTP funding formula as defined in 23 USC 202(b) or $500,000 may be expended for the purpose of maintenance, excluding road sealing which shall not be subject to any limitation);

Figure 2 – Navajo Nation/FHWA Funding Agreement excerpt

The NDOT Roads Department current annual funding is at approximately $5.5M. The remainder of funding available for paved road maintenance activities would then be $8.25M ($13.75M - $5.5M = $8.25M). This budget amount allows NDOT to maintain their current maintenance activities and still dedicate TTP funding to new paved road maintenance projects. During this project's kickoff meeting, the potential use of Navajo Nation FET funding was discussed. It was decided that the FET funding would not be utilized for paved roadway maintenance as it was better utilized in completing dirt roadway improvements.

Annual budget $$$s for NDOT PMSP projects

- NDOT TTP funding = $8.25M available
- BIA DOI-TPA funding = $1.7M (total of the FY2017 DMR reports, quarters 1-4)
  - Surface Type Code 5 = $583,053
  - Surface Type Code 4 = $1,133,378
- Total annual funding budget to work with = $9.95M

Knowing that the BIA funding may or may not be fully available for assignment, we will utilize a conservative total budget amount of $9M to start with for this year. This budget amount and the projects associated with the recommendations of this report are subject to the approval of NDOT Executive Staff, FHWA and the Navajo Nation RDC as part of their normal TTIP process.

1.5. Data Available

The data available for this PMSP Report was taken from two main sources, the NDOT Planning Department's 2015 RIFDs database and the BIA's Quarterly DMR Reports for FY 2017 (Quarter 1-4). The BIA FY 2018 reports were not available at the time of completing this work. The results of the Steps for development of the current FY PMSP as described in Chapter 3 are only as good as the data. The field reviews noted that several of the PCI values in the database were not correct which would indicate that the steps to refine/reduce the project list are most likely not 100% accurate. There are most likely (as was determined in our interviews) several other roadways within the Navajo Nation that are paved and meet the selection criteria for preventative maintenance.

Recommendation: With the understanding that the RIFDs database is an extremely large amount of information that requires constant updating, the NDOT Planning Department may not have sufficient staffing or time to properly update RIFDs in order to use it for future PMSP reports. NDOT may want to look into collecting the data independently on the paved roadways and importing it into the Paver Software to assist them in managing the pavement maintenance program. PAVER is further discussed in section 2.1.6. The data should be collected on a 5-year cycle or more frequently if staffing/funding permits.

NDOT could potentially utilize student interns in the summer or possibly maintenance personnel in the winter slow season to collect the PCI and other critical data. A secondary option for collecting data would be to hire a consultant and collect the data electronically (see section 2.1.2 for additional discussion of this option). The most crucial data that the PAVER Software requires includes; construction date, surface type, section rank, branch use, length and width of roadways and branch name/ID.

1.6. Types of Maintenance Treatments

Pavement Preservation

Routine Maintenance (PCI 80-100)

"consists of work that is planned and performed on a routine basis to maintain and preserve the condition of the highway system or to respond to specific conditions and events that restore the highway system to an adequate level of service." *Source: AASHTO Highway Subcommittee on Maintenance*

Routine maintenance consists of day-to-day activities that are scheduled by maintenance personnel to maintain and preserve the condition of the highway system at a satisfactory level of service.

Examples of pavement-related routine maintenance activities include cleaning of roadside ditches and structures, maintenance of pavement markings and crack filling, pothole patching and isolated overlays. Crack filling is another routine maintenance activity which consists of placing a generally, bituminous material into "non-working" cracks to substantially reduce water infiltration and reinforce adjacent top-down cracks. Depending on the timing of application, the nature of the distress, and the type of activity, certain routine maintenance activities may be classified as preservation. (Geiger, 2005)

Other actions can include flush, or fog, coats using emulsified asphalts or combinations of the emulsified rejuvenators and asphalts to renew the pavement surface in selected areas to complement crack sealing and patching. Additional actions may involve leveling treatment to rutted areas using cold bituminous mixture with a seal coat of some sort to seal the surface after the leveled area is allowed to cure.

These actions will generally maintain a PCI of 86 and greater for a period of 3 to 10 years depending on traffic and pavement structural section

Preventive Maintenance (PCI 30-79)
"a planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system (without significantly increasing the structural capacity)." *Source: AASHTO Standing Committee on Highways, 1997*

Preventive maintenance is typically applied to pavements in good condition having significant remaining service life. As a major component of pavement preservation, preventive maintenance is a strategy of extending the service life by applying cost-effective treatments to the surface or near surface of structurally sound pavements. Examples of preventive treatments include asphalt crack sealing, chip sealing, slurry or micro-surfacing, thin and ultra-thin hot-mix asphalt overlay, concrete joint sealing, diamond grinding, dowel-bar retrofit, and isolated, partial and/or full-depth concrete repairs to restore functionality of the slab; e.g., edge spalls, or corner breaks. (Geiger, 2005)

On the Navajo system, preventive maintenance should normally consist of chip seals, flush coats, and in some cases 2" overlays or 2" mill and fill type projects. Crack sealing can be an integral part of the process since it may be required prior to seal coats or overlays to ensure the preservation of the existing structural section.

Preventive maintenance programming starts when routine maintenance is unable to return the pavement section to the higher PCI level. Preventive maintenance activities, mainly the chip seal or flush coat, will begin at years 5 to 7 and may be required at years 8 to 10 as a second treatment prior to an overlay which normally is considered at years 10 to 15. Preventive maintenance actions can be followed for an additional two plus iterations, again depending on existing pavement section and surrounding conditions.

New Pavement Preventive Maintenance Cycle

As part of our NMDOT interview, Tom K. provided us with his recommended cycle of maintenance efforts based on a new pavement installation.

Pavement maintenance cycles are dependent on the road location (weather and traffic type/movements). There are areas of the state that have extreme weather cycle patterns that will increase the pavement deterioration rate.

- *3-5 years: Fog seal the pavement. This cycle can be repeated if no other issues present themselves.*
  - *The timeframe for the initial application depends on the original mix design (low <5% oil content = 2-3 years, higher oil content 6% = 3-5 years).*
  - *Fog seals don't work as well with OGFC as it slowly fills the voids and prevents the capability of OGFC to shed water.*
- *> 5 years: Crack seal (when cracking starts to appear).*
  - *Don't let the cracks get too big as you will need to spend more effort in getting them filled. May have to route them.*
- *7-8 years (approximately 2 years after the crack seal): Thin overlay.*
  - *This can be a new OGFC layer or Novachip. Novachip is not a good application if there are wide cracks present.*
- *10-15 years: Mill and inlay.*
  - *The milling depth should leave at least 1½" - 2" of asphalt material behind so as not to damage it.*
  - *If you have a thin asphalt section, then you make have to mill a small amount and overlay with a thicker section, which in turn raises the profile of your roadway. Doing this can have negative impacts to your pavement taper, guardrail/CWB installations, culverts and bridge clearances.*
  - *If you don't have enough material and have to take it all off, then you will have to reshape and compact the subgrade before placing the new asphalt back on.*

Improved Gravel/Dirt Surface Preservation

Routine Maintenance

Routine maintenance of gravel/dirt roadways for improved surface conditions is similar to what is outlined for pavement routine maintenance. The difference is that routine maintenance for these roadways include the routine blading of roadways, pothole repair in both gravel and improved dirt segments, and drainage maintenance that impacts the surface. Routine activities may also include spot repairs of treated surfaces, those that have had dust suppressant or some other binder placed on the surface or mixed into the surface material.

The timing of these routine maintenance activities are predicated on the Average Daily Traffic (ADT) of the roadway and the classification of the roadway. Blading of the roadways should be at least four times per year depending again on traffic and weather. Using 400 vehicles per day (vpd) as the split between low volume and high volume roadways the following schedule is recommended for the gravel and improved dirt roadways. Dust abatement is included in the routine program as well.

- High Volume – 5 to 10 days cycle
- Low Volume – 3 to 4 weeks cycle
- Low Usage – Seasonal/Minimum 4 times per year
- Dust Abatement – Once a year

Surface Preservation

Surface preservation activities are typically applied to surfaces in good condition having significant remaining service life. Surface preservation is a strategy of extending the service life by applying cost-effective treatments to the surface or nearsurface of well-performing surfaces including gravel and improved dirt surfaces. Examples of preventive treatments include repair of roadway crown, cleaning of drainage infrastructure, spot regraveling, repair of soft areas, and spot repairs using dust abatement or stabilization treatments.

Surface preservation begins when routine maintenance is unable to return the existing surface to an acceptable level. These activities will normally occur on an annual basis, especially immediately during the spring and depending on intensity, after the southwest monsoon season.

Surface Rehabilitation

Surface rehabilitation consists of non-structural and structural enhancements made to the existing surface sections to eliminate age-related wear and weather impacts to existing surface.

These activities include reshaping roadway sections including the drainage ditches and facilities; regraveling and new gravel major segments of the roadway; and, reconstructing failed areas. These activities would be required 5 to 8 years into the life cycle of the existing surface.

In the cases of gravel and improved dirt roadway surfaces, paving should be considered when the roadway ADT exceeds 500 vpd and that rehabilitation activities are required at less than 5 years as part of the life cycle. Paving activities may include chip sealing the surface after stabilization of the surface or doing some type of bituminous treated grade assuming that there is a reasonably sound structural base.

Chapter 2 - Development of PMSP

2.1. Steps to Complete

The following recommended steps to developing a PMSP were collected from several different agency/federal guidelines with the majority of the information coming from the *Illinois Center for Transportation, Implementing Pavement Management Systems for Local Agencies, August 2011*.

2.1.1. Step 1: Defining the network & collect data

After defining the roadway network, inventory information is collected by either estimating the data or collecting all needed information.

The first step in designing a pavement management process is to define the roadway network. A roadway network is comprised of an inventory of the physical characteristics of the roadways being managed by the agency. The inventories are typically built by dividing the network roadways into manageable segments. These segments are divided based on similar characteristics, and they are of specific importance since they will serve as the basis for planning future maintenance and rehabilitation projects. Factors that may define the boundary between roadway segments include changes in the following attributes:

- Pavement surface type (e.g., hot-mix asphalt or portland cement concrete).
- Pavement structure (e.g., pavement materials or thickness).
- Construction history (e.g., different construction periods, different contractors, or different materials and techniques)
- Roadway geometry (e.g., number of traffic lanes).
- Traffic (e.g., volume or patterns).
- Pavement condition (e.g., significant variation in condition that is not simply an isolated area).
- Geographic boundaries (e.g., intersections, bridges, waterways, jurisdiction limits, railroad crossings).

Using these factors as a guideline, meaningful segments can be created and used by the agency to identify pavement repair needs. This technique allows work recommendations to be more meaningful since it promotes the use of one segment to define the length of maintenance or rehabilitation project, which eliminates the need to group multiple segments together to create recommended maintenance and rehabilitation projects.

After segments are defined in a manner that best fits the needs of the given agency, the inventory information for each segment is collected. Typical inventory data collected for a pavement management system includes:

- Roadway Name – A written description of the roadway name and any corresponding numeric references
- Pavement Location – Physical reference to the location, including “beginning location” and “ending location” designations.
- Pavement Dimensions – Values including length, width, and/or area
- Pavement Type – The material that comprises, at a minimum, the pavement surface.

- Construction History – Details of the latest maintenance and rehabilitation treatments and construction date, and, if possible, original construction dates and additional maintenance and rehabilitation records.

The data outlined above serves as the minimum amount of data needed to complete the segment inventory. Additional data that may be beneficial to the agency to support the pavement management processes includes, but is not limited to:

- Functional Classifications – Type of service the roadway was intended to provide (e.g., arterial, collector, or local/residential).
- Layer Thicknesses – All the thicknesses of the layers above subgrade.
- Subgrade Information – Type and material classification.
- Drainage Characteristics – Occurrence of curb and gutter or ditches and related details.
- Ownership information – Details on jurisdiction.
- Shoulder Data – Shoulder type and width.
- Traffic Information – Details on average daily traffic (ADT) and truck traffic.

The desired inventory data is summarized for each pavement segment defined in the network. While some inventory data require updates with time, information such as names, location, and dimensions do not normally require modifications unless changes have been made to the network. Compiled inventory information can be stored a variety of ways:

- Paper records.
- Electronic spreadsheets.
- Databases (e.g., either stand-alone database or a database as part of pavement management software).
- Maps (e.g., GIS-based maps).

The definition of the pavement network and the collection of inventory data can be labor-intensive tasks. Therefore, as the agency determines the extent of needed inventory data for their agency's pavement management process, it can move forward by either estimating data or collecting needed information for each pavement segment.

Estimating data allows agencies without readily available summaries of information to complete an inventory and move forward with the pavement management process without needing to collect every detailed piece of information. Estimated quantities can be updated in the future to correct the inventory information. For example, roadway lengths and widths may be estimated to complete the initial inventory, but the information can be updated to reflect field conditions during a pavement condition survey.

Some agencies decide that it is worth the time and effort to complete the summary of all inventory data prior to moving forward with the other implementation steps. For those agencies that are planning to collect all information, data may be obtained from an agency's existing paper or electronic records that detail the attributes the agency is interested in tracking. Also, missing data can often be supplemented by expert knowledge of those that have been with the agency for a significant period of time (e.g., construction managers and maintenance supervisors can often help populate information regarding construction history).

The decision to estimate inventory quantities rather than collect data prior to other implementation steps should be based on the agency's analysis and reporting needs as well as the resources available to collect and maintain the data with time.

2.1.2. Step 2: Collection of condition data (current and future)

Distress data will be estimated or measured and condition data will be collected using either manual or automated data collection methods

Pavement condition data are a major factor in any data-driven, decision-making pavement management process. Within the pavement management process, the condition data can be used to help identify current maintenance and rehabilitation needs, to predict future needs, and to assess the overall impact on the network. Therefore, the type of condition data required and the level of detail depends on the agency and the pavement management process used. Collecting pavement condition data can be an elaborate process, so selecting an appropriate method is an important step for an agency. Condition data that are not used to support decisions or are not needed for specific reporting purposes should not be considered essential to the pavement management process as it may be difficult to keep the data current. Special attention must be given to balancing the level of desired data and the resources available to collect and maintain the data into the future. When selecting a condition data collection method, there are two main considerations:

- Data quantity – Data quantity refers to what and how much information is collected. Both have time and cost implications since the greater the volume of data collected or the more detailed the collected data, the higher the cost of data collection.
- Data quality - Although the associated cost of the data increases, more detailed data for analysis can result in better analysis decisions. For most agencies, the goals for network-level surveys are to develop appropriate budgetary needs and to evaluate the performance of previously implemented strategies.
- Data collection technique – There are two options to collecting data, the first option being through field reviews and visual assessments by NDOT personnel. The second option would be to hire a consultant to collect the data electronically with van-mounted radar technology. The cost to do the collection electronically would be approximately $85 - $90 per lane mile (according to NMDOT contracts). Applying this rate to NDOT's paved miles (1612) would result in a cost of $145,080 for a single lane of data (double that if you want to pick up both lanes). The data should be collected on a 5-year cycle or more frequently if staffing/funding permits.

NDOT's Current Process:
NDOT Department of Planning technicians are the ones responsible for collecting the pavement data that gets input into RIFDS. The technicians follow the guidelines of the *Transportation Information Center, University of Wisconsin-Madison, Pavement Surface Evaluation and Rating, PASER Manual for Asphalt Roads, 2013*. The PASER Manual provides guidance on evaluating surface defects/deformation, cracks, patches and potholes. The evaluation is then used to determine a surface rating on a scale of 1 to 10 with 1 = Failed and 10 = Excellent (see Figure 7 in section 3.1). This rating number multiplied by 10 will give the technician the PCI value that they input into the RIFDs database.

Prior to using PASER, NDOT planning followed the *BIA's IRR RIFDs Guide, Appendix D* methodology. This

method rates the pavement characteristics on a value of "0" to "5" using a spreadsheet. The ten characteristics evaluated are: longitudinal cracking, transverse cracking, alligator cracking, grade depression, rutting, corrugations, raveling, bleeding, patching and other. These values are then averaged and multiplied by 20 to provide a value for the wearing surface rating in RIFDs.

2.1.3. Step 3: Predicting pavement condition

Pavement conditions can be predicted for the pavement network using either average deterioration rates or prediction models using statistical modeling such as regression analysis

With current pavement condition assessed, agencies are equipped with the information needed to predict the future condition of a segment. In pavement management, conditions are predicted in terms of performance models that estimate the average rate of pavement deterioration each year. In addition to forecasting future conditions, performance models assist with the following activities (Broten 1997):

- Identifying the appropriate timing for pavement maintenance and rehabilitation for each segment.
- Identifying the most cost-effective treatment strategy for pavement segments in the network.
- Estimating pavement needs and associated budgets required to address agency-specified goals, objectives, and constraints.
- Demonstrating the consequences of different pavement investment strategies.

If an agency wants to develop a multi-year pavement maintenance and repair program, it needs to project pavement conditions into the future. Prediction models are used to determine the future condition of a pavement segment. A performance curve is calculated by evaluating past historical data often in terms of pavement age and condition. The models can be produced for any measure of condition according to agency need. The most basic form of a performance model is an average rate of deterioration for a single pavement section or a group of pavement sections with similar characteristics, known as pavement families. The creation of average deterioration rates is a simple process that works well when an agency is interested in using paper or spreadsheet methods of evaluating the performance of their pavement network. More sophisticated performance models are often used by agencies that invest in pavement management software, since the programs often provide the tools to create and use the prediction equations for either individual pavement segments or groups of pavements with similar characteristics.

Average Rate of Deterioration

Using the collected condition information, deterioration rates can be estimated for pavement sections using the following equation:

$$Deterioration\ Rate\ = \frac{(\text{PastRating} - \text{Current Rating})}{\text{Number of Years Between Ratings}}$$

Wilson & Company requested historic PCI data from the NDOT Planning Department, but nothing was available. This type of data will need to be collected on the newly constructed pavement projects and used as described above to predict the deterioration rate.

2.1.4. Step 4: Selecting treatments

Treatments are selected using cyclical placements or treatment trigger rules. The recommended treatments are then prioritized using ranking or benefit/cost analysis.

The fourth step in designing the pavement management process is to select appropriate treatments for the roadway network. The selection of treatments is based on the agency's defined maintenance and rehabilitation strategy, which is created by selecting trigger values to identify segments needing repair. Trigger values are thresholds that can be used to signify the need for various treatments to be applied to pavement segments. For example, pavement age, pavement surface condition, or traffic can be used as a factor to determine the eligibility of a pavement for repair. The selection of a treatment can be based on either a cyclical selection or the creation of treatment rules.

Cyclical Treatment Selection

One method of selecting a treatment for a pavement segment is through a cyclical method of applying a treatment to given pavement sections. Many agencies select maintenance strategies based on pavement age. These treatments are then repeated at specific time intervals. For example, an agency may choose to chip seal all pavements on a 7-year cycle. The agency can then divide the pavement network into seven regions and cycle through the regions every 7 years. The placement of the treatment increases the pavement life and, if applied at the correct time, can prolong the life of the pavement. However, the timing of such a treatment is critical to its performance and overall cost-effectiveness. Therefore, it is difficult to achieve the most effective treatment timing using cyclical treatment selection as the cyclical placement is regimented and does not allow for flexibility in addressing the placement of the treatment at the right time for each pavement segment independently.

Treatment Rules

In addition to the creation of cyclical treatment triggers, another method of treatment selection is the use of treatment rules that are developed into a matrix or a decision tree. To develop treatment rules, an agency needs to define its treatment strategy. That is, select treatments that will be applied at specific condition levels for pavements with specific inventories.

Ranking

Project priorities can be selected using a ranking of projects based on some type of agency priority, such as pavement condition, functional classification, and/or traffic levels as described in this section or by using benefit/cost analysis as described in the next section. Ranking is the simplest method of selecting projects and normally results in a yearly evaluation of selected projects. One method of using the ranking approach is to fix the pavements in the worst condition first. However, this "worst-first" approach does not help maintain those pavements that are in good condition and can lead an agency into a costly cycle that does not provide any funding for the preservation of pavements. If an agency decides to use a ranking technique, it generally follows the steps listed below (Zimmerman 2011).

- Assess needs for a given year by identifying all pavement sections that are not in excellent condition.
- Calculate treatment costs by multiplying the cost of the appropriate treatment for each level of repair times the project area.
- Sort the needs in priority order using the ranking methodology established by the agency. For a worst-first strategy, the road sections in worst condition would be the highest priority.

- Select projects in accordance with the prioritized listing until there is no funding left for that year.
- Consider any remaining unfunded needs in the next year and repeat the process.

For the NDOT PMSP results, the selection criteria for the upcoming FY 19/FY 20 projects list was heavily based on the BIA's DMR listings. Roads not falling on the DMR were eliminated. The remaining roads were given priority ranking based on the BIA's DMR Level of Service code with higher priority going to ones having a Level of Service 5 = Failing (see Step 4 in Chapter 3).

Benefit/Cost Analysis

A benefit/cost analysis allows an agency to work at prioritizing, or even optimizing, the choice of treatments on a multi-year period. This approach is preferred over a ranking approach because multiple treatments are considered, consequences of delaying or accelerating a treatment are evaluated, and the cost-effectiveness of a treatment is taken into account in developing the program recommendations. (Broten 1997).

The benefits of the treatment, which are normally represented as the increase in pavement condition, are divided by the construction cost to determine the benefit/cost ratios, as shown in Figure 3. Therefore, the longer the pavement stays in good condition, the more benefit will be accrued by the user and the higher the benefit/cost ratio. Those projects which provide the greatest benefit for the funds expended are considered the best choices.

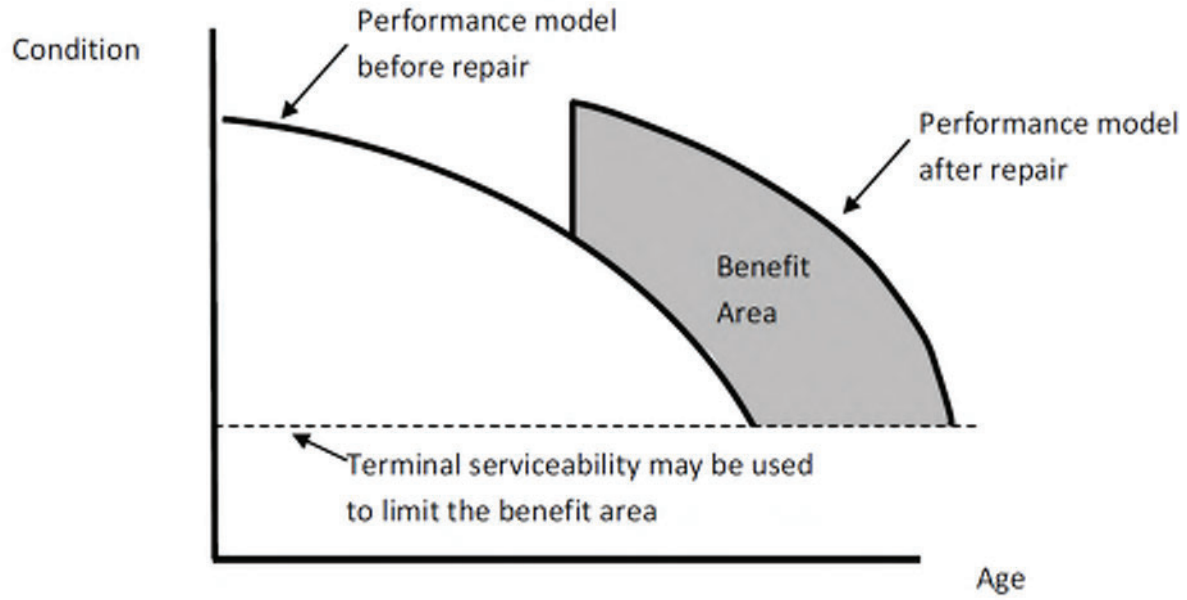


Figure 3 – Benefit determination using performance curves (Broten 1997)

Selecting Appropriate Methodology

To help identify the most appropriate treatment for each project, agencies may choose to use either a cyclical schedule or treatment rules. Cyclical timing works well for agencies that utilize a spreadsheet to manage the pavement network, whereas the creation of treatment rules, while possible within a

spreadsheet, can be cumbersome. Treatment rules are easily created within public and private pavement management software. After treatments are determined they then must determine the prioritization of the projects since most agencies have more needs than available funding. Agencies can choose to prioritize projects based on ranking or through benefit/cost analysis. Benefit/cost analysis is best conducted inside a PMS, while ranking can be easily accomplished in a spreadsheet tool. The results of the treatment selection step provide final work plan recommendations for the agency.

2.1.5. Step 5: Reporting results

Analysis results can be shared with users of the information using standard or customized reports.
The reporting of project results is the fifth step in the implementation process, in which the results of data analysis are presented. The findings can be reported using different methods to highlight important factors, which will assist decision makers in making various decisions. Data reporting is an effective method of communicating not only the recommendations of the pavement management process but also transferring related information to strategic decision makers. The data can be used to generate summaries of relevant information pertaining to any segments under consideration. In general, the results can be presented either by using standard reports or customized summaries.

Standard Reports
Typically, analyzed data can be represented in the form of standard reports and charts that are available from various pavement management software programs or from spreadsheets. The pavement management process tool provides a platform to utilize the results of an analysis and generate different types of reports, such as work history information, section information, and pavement condition information.

Standard graphics are often used to display percent of pavement mileage in various condition categories. These graphics provide a representation of the overall condition of the roadway network for each entity

Selecting Appropriate Methodology
Most agencies use a combination of standard and customized summaries to display their pavement management information. The visual aids generated depend on the needs of an agency and the type of information to be represented. A variety of forms exist for creating visual aids to report pavement management data. General guidance on the types of visual aids that work best for sharing data with various users of pavement management information and examples of each is summarized in Table 1.

The reporting necessary for the NDOT LRTP goal are shown in section 1.1.

Visual Aid	When to Use	Examples
Tables	• Incorporate into a report or document for detailed-oriented user (engineers, planners, etc.) • Display extensive amount of detailed information • Support detailed analysis and provide technical information	• Inventory listing (e.g., segment location and name, surface type, age, traffic) • Condition listing (e.g., segment name, condition indices) • Maintenance listing (e.g., segment name, year of maintenance activity, maintenance type and cost) • Budget listing (e.g., money proposed for repairs for each segment or for various functional classifications)
Charts	• Present information to nontechnical audiences, such as elected officials and the public • Emphasize points to be made (easy method to convey simple summaries)	• Pie chart (shows size of each part as a percentage of the whole) – figure 12 • Column chart (show how items change with time or compare to one another) – figure 13 • Line chart (shows how items change over time and can compare "what if" budget scenarios) – figure 15
Maps	• Display single type of information on a geographical basis • Present information to nontechnical audiences, such as elected officials and the public	• Segment surface type • Color-coded current condition • Color-coded projects by year • Future condition for a funding scenario • Deferred projects

Table 1. Visual aids for reporting information to the users of pavement management data (Broten 1997)

2.1.6. Step 6: Select a pavement management tool

Depending on their needs, an agency can opt to use a spreadsheet, GIS tool, and/or a pavement mana gement system (public or private).

There are several different types of software that can help NDOT manage the PMSP. The *Illinois Center for Transportation, Implementing Pavement Management Systems for Local Agencies, August 2011* provided a Table 4 that summarized the available software back in 2011 (see Figure 4). Based on the interview with the City of Rio Rancho and discussions with NDOT, Wilson & Company investigated two of the softwares (Paver and PubWorks as highlighted in Figure 4). Each software was looked at to see how it would benefit NDOT in terms of helping to manage the maintenance of their roadways. The complexity of each software was reviewed to see what features and capabilities that each software

offers. The amount of required data was also reviewed to see what is needed for the software to run effectively. A brief explanation of each software follows.

Table 4. Comparison of pavement management software features[1]

CRITERION DESCRIPTION	PAVEMENT MANAGEMENT SOFTWARE PROGRAMS							
		PUBLIC					PRIVATE	
	MicroPAVER	RoadSoft GIS	Utah LTAP TAMS	StreetSaver	RoadCare	PAVEMENTview Plus	PubWorks	PavePro Manager
Vendor	US Army Corps of Engineers	Michigan Technological University - Center for Technology & Training	Utah Local Technical Assistance Program	Metropolitan Transportation Commission	Applied Research Associates	Cartegraph	Tracker Software Corporation	Infrastructure Management Services
Website	www.ipavement.com	www.roadsoft.org	www.utahltap.org	www.mtcpms.org	www.ara.com	www.cartegraph.com	www.pubworks.com	www.ims-ist.com
Laptop Data Collection	Yes	Yes	Yes	Additional program needed	*	Yes	Yes	*
Ability to Analyze Other Assets	No	Yes, signs, pavement markings, traffic counts & traffic crashes	Yes	Yes, sidewalks, signs, sign, curb and gutter, & user-defined	*	Yes, sewer, signal, sign, storm, bridge, & lights	Yes, bridges, signs, culverts, guardrails, parks, & buildings	*
Default Pavement Condition Rating Measure	PCI	PASER	RSL	PCI	PCI, IRI	OCI	PASER	*
Analyzes Different Maintenance Strategies	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Analyzes Different Budget Scenarios	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
GASB 34 Reporting	No	Yes	No	Yes	*	Yes	Yes	*
GIS Integration	Yes	Yes	Additional software needed	Additional software needed	Additional software needed	Additional module-GIS director or own software	Additional module MapViewer needed	Additional software needed
Customization Capabilities	Yes	Only certain aspects	Yes	Yes	*	*	Additional modules available	Additional modules available
Cost (2011)	APWA members $995, non-members $1095	Contact vendor for more information	Utah-free/Out of state $500	$1500+, contact vendor for more information	Varies, contact vendor	Varies, contact vendor	Varies, contact vendor	Varies, contact vendor
User's Manual	Yes	Yes	Yes	Yes	*	Yes	Yes	*
Technical Assistance	Training courses or four-part web-based training	Telephone or web-based training	Free telephone or paid on-site arrangements	4-day training class twice per year and customized on-site training	*	On-site or web-based training; technical support by phone	Formal training at 1-day per module, free updates, software helpdesk	*

[1] PCI – Pavement Condition Index; PASER – Pavement Surface Evaluation and Rating System; RSL – Remaining Service Life; IRI – International Roughness Index; OCI – Overall Condition Index

(*) Denotes: Unable to obtain information at this time. Contact vendor for more information.

Figure 4 – Table 4 from *Illinois Center for Transportation, Implementing Pavement Management Systems for Local Agencies, August 2011*

Paver Software

Features

- Inventory Collection
- Records of road inspections
- Software calculates PCI Values based on distress values
- Maintence & Repair planning Reports
- Analysis PCI Values

Paver is a software that was developed to use data that is imported into the software to help manage the maintenance of the roadways within a system. The software keeps track of when the roadways were constructed and the maintenance and inspections that are performed on the roadway. This software is a database that has many features that could be used to decide which roadways requires maintenance based on the PCI value of the roadway. An advantage to using this software is the PCI values are calculated by the software when the distress values are entered in during an inspection of the roadway. From these PCI values there are different scenarios that could be analyzed in the software. Which

include generating lists and graphs to show the overall conditions of the roadways and see which roadways require maintenance based on the PCI Value.

There are many different variables that can be inputted into Paver. The software is customizable when it comes to evaluating how much a project would cost to do maintenance to the roadways. The unit cost of the different maintenance types can be entered into the software. This software can give an estimate of how much money would need to be allocated in the budget for maintenance of the roadways. There are also tools to help see what roadways require attention based upon what variables and conditions that are set up in the software. A budget can also be entered into this software to see which maintenance projects could be funded based on the budget that is entered into the software.

This software has many different aspects of how it could be used as a tool to manage the assets and provided adequate maintenance to the roadways to keep it within a reasonable PCI value. In order for the software to be most effective. Data is going to have to be entered in to the software. The most crucial data that is required includes construction date, surface type, section rank, branch use, length and width of roadways and branch name and branch ID. This software also has the capability to import GIS data. When it comes to calculating the PCI values of the road an inspector would need to enter in the distress values of the road into the software. Overall this software has many features to keep good records on maintenance and inspections of roadways.

PubWorks

Features	•Asset Management •Quality Assessment function for pavement •Custom attributes can be added to the roadway •Depiction tab for montary value of assets in the inventory

Pubworks is a software that is known for being an asset management software. It can keep an inventory of all the roadways in a system. This software has a quality assessment function for pavement that follows the PASER Methodology of the assessment of asphalt roadways. This software can be customizable by adding custom attributes to the roadway sections and links. The monetary value of assets can be determined in the inventory of the roadways. The value of the asset is not that relevant to pavement management. This software does not have capabilities to predict the aging of the roadway. Pubworks does not have options to deal with monetary and budgeting features. Overall, this software's main application is to be used as an asset management system. It is not recommended for implementing any future NDOT PMSP. See Appendix E for the meeting minutes taken from a January 2018 web meeting with Pubworks software representatives.

Recommendation: At this time, it is recommended to hold off on purchasing or implementing a pavement management software until NDOT can review and implement the projects that are currently recommended for FY 19/FY 20.

2.1.7. Step 7: Keep the process current

Pavement management is a dynamic process that requires regular updates. Pavement management is not a one-time activity, so agencies must make an effort to update the information incorporated in the pavement management process. Data management is a key component to maintaining the database and keeping the information current. The required updates needed to keep the overall pavement management process current are outlined for the first five pavement management process steps:

1. Define Network and Collect Data – Inventory information related to pavement segments are relatively constant components of a database. These elements need to be updated only in the case of major changes to the pavement network. Work history details, however, should be updated on an annual basis to keep proper track of maintenance and rehabilitation activities on the pavement sections.

2. Collect Condition Data – General pavement management practices recommend that condition information is collected on a minimum 3-year cycle on pavement segments (Zimmerman 1996). Therefore, this data should be collected and updated in the pavement management spreadsheet or software on the same cycle.

3. Predict Condition – Average deterioration rates can be updated with each data collection cycle. If prediction models are utilized, consider updating them every 3 years when initially developed and then on a 5-year cycle after they are established.

4. Select Treatments – As agencies use the results of recommended treatments based on treatment selection processes, the rules and priorities should be updated to ensure that the process continues to improve in the future.

5. Report Results – Report results will be used by an agency with each new pavement management plan, which ideally should be conducted each year or on a maximum 3-year cycle to correspond with the 3-year data collection cycle.

Timeframes

The timeframes described above refer to having a minimum 3-year cycle for collecting the condition data and completing an updated PMSP report. Due to the high number of paved miles (1612) that NDOT is dealing with, this 3-year cycle may not be possible. Data collection for the entire roadway network is dependent on the type of data collection and the number of individuals assigned to complete the effort. One could safely assume that a full-blown roadway data collection (manual effort) using several teams would take upwards of six to eight months to complete. If additional funding for pavement data collection is not possible, then the responsibility falls back on the NDOT Planning Department to provide updated PCI values as part of their RIFDs updates. The RIFDs data is supposed to be fully updated on a 5-year cycle for NDOT's Long Range Transportation Plan.

The timeframe to complete a new PMSP Report and provide a new project priority list would best follow the 5-year cycle of the RIFDs/LRTP updates as the PCI data and Navajo Nation goals would be updated at this time as well. This would also allow the list of projects in Table 6 to be completed before determining a new project listing.

2.2. Public Input and Awareness

As with all agency reports and project listings, the advertising and solicitation of public input is essential to gain public and governing body buy-in. This public input and awareness effort has already been completed back in April 2016 as part of the Navajo Nation Long Range Transportation Plan (LRTP) and can be found at the website link below:

http://www.navajodot.org/uploads/files/LRTP_04022016.pdf

The resulting goals of the LRTP indicated that the Navajo Nation population overwhelmingly wants to *Take Care of the System* as it was the #1 goal to come out of the public input meetings. The LRTP did not provide a specific project listing, but it confirmed that NDOT's road maintenance strategy should have priorities based on the Figure 5 shown below. These levels of priority were taken into consideration when preparing the project recommendation priority ranking in Chapter 3.

Pavement Condition Priority					
	Failure	Poor	Fair	Good	Excellent
Major Arterial	Low	Low	Moderate	High	High
Minor Arterial	Low	Low	Moderate	High	High
Collector	Low	Low	Moderate	High	High
Local*	Low	Low	Moderate	Moderate	Moderate

* Many local roads in housing subdivisions are operated and managed by the Navajo Housing Authority, and not NDOT.

Figure 5 – NN LRTP – Pavement Condition Priority (Wilson & Company 2016)

2.3. NDOT Asset Management Plan

The PMSP herein can be considered as a section or portion of NDOT's overall asset management plan for the transportation infrastructure that NDOT is responsible for.

> *MAP 21 defines asset management as a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost. (23 U.S.C. 101(a)(2), MAP-21 § 1103).*

Chapter 3 - Current Fiscal Year (FY) PMSP

3.1. Pavement Maintenance Priorities

Knowing that the current pavement data and roadway information is limited and possibly inaccurately coded in some of the RIFDs rows, the pavement maintenance priority process had to be simplified for this FY report's recommendations. Below is a simple step-by-step process in which the existing RIFDs data was prioritized to determine the NDOT roadway system potential maintenance projects.

The original RIFDs data set was provided to Wilson & Company by the NDOT Planning Department in November 2017. Upon completing the NDOT review of the draft PMSP in November 2018, the NDOT Planning Department provided an updated RIFDs data set to Wilson & Company. Steps 1-5 were conducted using the old RIFDs data set, but the final Step 6 prioritization of projects was completed using the new data. Tables 5 & 6 reflect the information contained in the new RIFDs data set.

Step 1 – Reduce Data Set

- Define the potential paved roadway list using the RIFDS data. The data was sorted to isolate the roads with a Surface Type Code equal to "4" or "5." These values represent potential roadway surfaces that are Bituminous, understanding that a majority of the Type 4 roadways are probably just chip seal.
- Eliminate any type 4 or 5 roads that do not belong to the BIA or NDOT. These would include roads owned and maintained by Arizona, New Mexico, Utah, counties and the National Park Service.
- Applying these two filters to the RIFDs data reduced the number of data entries to approximately 1418 lines. It should be noted that the RIFDs data for some of the roads is broken up into a large number of sections (up to 36 sections identified for BIA Route 2011).

Step 2 – Sort Existing Data Set

- The RIFDS data set was then sorted by the PCI #, the Surface Type, the Age of Road and finally by the ADT Count (as shown in Figure 6 below).
    - PCI # - was sorted from smallest to largest value to push the roads with the worst pavement condition to the top.

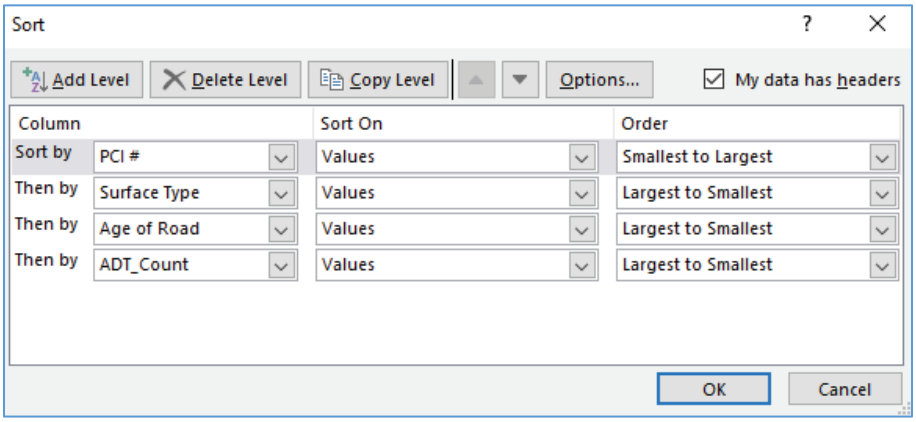


Figure 6 – Step 2 Sorting Criteria

- The Surface Type Code, Age of Road and ADT Counts were sorted to give the higher values a higher priority.

- The PCI # values were summarized below based on the PASER Rating system (1 – 10) and color coded for ease of identification. Approximately 67% of the roadway segments in the RIFDs database fall within the Poor to Fair to Good range values (3 – 7).

PCI Values Summary			
	Range		
Rating	From	To	Total
1 - Failed	0	19	221
2 - Very Poor	20	29	43
3 & 4 - Poor to Fair	30	49	387
5 & 6 - Fair to Good	50	69	415
7 - Good	70	79	149
8 - Very Good	80	89	144
9 & 10 - Excellent	90	100	54

Table 2 – RIFDs PCI Values Summary

Step 3 – Eliminate Roads that fall beyond Maintenance or require NO Maintenance at this time

- The road sections that have a PCI # falling below a specified threshold were removed from the data set as these sections would not qualify for maintenance, but would need to undergo full reconstruction instead. The data value chosen for this step was a PCI # = 29. This data value is based on the PASER Manual for Asphalt Roads Rating System. Per the Rating System values, the roadway sections falling within the 1 = Failed and 2 = Very Poor ratings were described as needing reconstruction (see Figures 7 and 8). This equates to PCI #s ranging from 0 to 29.

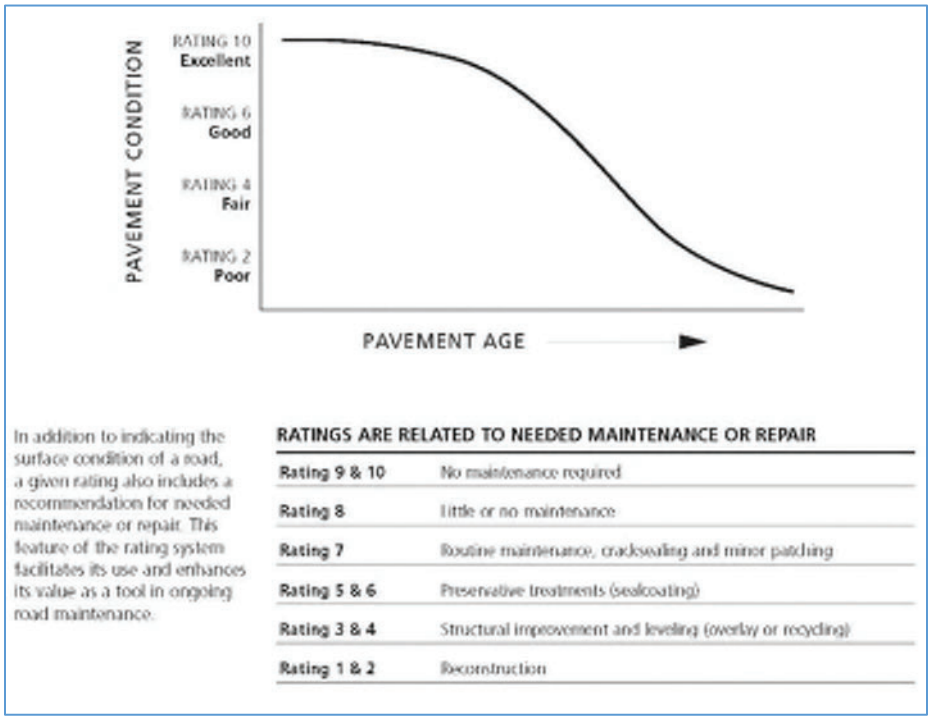


Figure 7 – PASER Manual, Rating Curve (2013)

Rating system

Surface rating	Visible distress*	General condition/ treatment measures
10 Excellent	None.	New construction.
9 Excellent	None.	Recent overlay. Like new.
8 Very Good	No longitudinal cracks except reflection of paving joints. Occasional transverse cracks, widely spaced (40' or greater). All cracks sealed or tight (open less than 1/4").	Recent sealcoat or new cold mix. Little or no maintenance required.
7 Good	Very slight or no raveling, surface shows some traffic wear. Longitudinal cracks (open 1/4") due to reflection or paving joints. Transverse cracks (open 1/4") spaced 10' or more apart, little or slight crack raveling. No patching or very few patches in excellent condition.	First signs of aging. Maintain with routine crack filling.
6 Good	Slight raveling (loss of fines) and traffic wear. Longitudinal cracks (open 1/4"–1/2"), some spaced less than 10'. First sign of block cracking. Slight to moderate flushing or polishing. Occasional patching in good condition.	Shows signs of aging. Sound structural condition. Could extend life with sealcoat.
5 Fair	Moderate to severe raveling (loss of fine and coarse aggregate). Longitudinal and transverse cracks (open 1/2") show first signs of slight raveling and secondary cracks. First signs of longitudinal cracks near pavement edge. Block cracking up to 50% of surface. Extensive to severe flushing or polishing. Some patching or edge wedging in good condition.	Surface aging. Sound structural condition. Needs sealcoat or thin non-structural overlay (less than 2")
4 Fair	Severe surface raveling. Multiple longitudinal and transverse cracking with slight raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (1/2" deep or less).	Significant aging and first signs of need for strengthening. Would benefit from a structural overlay (2" or more).
3 Poor	Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (1" or 2" deep). Occasional potholes.	Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay.
2 Very Poor	Alligator cracking (over 25% of surface). Severe distortions (over 2" deep) Extensive patching in poor condition. Potholes.	Severe deterioration. Needs reconstruction with extensive base repair. Pulverization of old pavement is effective.
1 Failed	Severe distress with extensive loss of surface integrity.	Failed. Needs total reconstruction.

** Individual pavements will not have all of the types of distress listed for any particular rating. They may have only one or two types.*

Figure 8 – PASER Manual, Rating System (2013)

- It should be noted that 192 rows in the RIFDs data set had a PCI # of "0." This most likely is not a correct value of the pavement condition, but rather a lack of data being input. This is apparent in the rows where the age of the road is relatively small (< 10 years), but still contained a "0" value for the PCI. Errors in the RIFDs data and the accurate collection of the pavement conditions will be extremely important for the future use of this prioritization process.

- In a similar manner to the above, the road sections that have a PCI # above a specified threshold were removed from the data set as these sections would not require any maintenance at this time, but could be eligible for future maintenance activity beyond FY 2019 or possibly seal coat applications which do not count towards maintenance funding limitations. The data value chosen for this step was a PCI # = 80. This data value is based on the PASER Manual for Asphalt Roads Rating System. Per the Rating System values, the roadway sections falling within the 8 = Very Good and 9/10 = Excellent ratings were described as showing little to no distress and being new (or like new) construction requiring little or no maintenance (see Figures 7 and 8). This equates to PCI #s ranging from 80 to 100.
  - Applying these two filters to the RIFDs data reduced the number of data entries to approximately 951 lines.
- The remaining data can be considered good candidates for FY 2019/2020 maintenance projects.

Step 4 – Resort the Data using Road Name/ADT Count. Select preferred Routes using BIA DMR data.

- The data was resorted one more time to combine the rows having the same Road Name. The data was then highlighted to define alternating road names and then the common Road Names were then numbered using a new column to assist in further data sorting. The resulting number of roadway segments from this step falls to just under 400 (at 397).
- The next step takes us back to the BIA's DMR reports for FY 2017. With the understanding that the BIA's maintenance funding is not sufficient to support all the pavement maintenance needs, the goal of the NDOT maintenance program would be to support the BIA's needs with their TTP funding dedicated to roadway maintenance.
  - For this part of the step, the FY 2017 4th Quarter DMR values for Surface Type Code 5 and 4 were used. The Level of Service Code, Maintenance Need ($), and Length (mi) were sorted (see Figure 9) to give the higher values a higher priority.
  - The desire of this sorting step would be to find roadways in the BIA DMR that are:
    - listed as Level of Service Code 3 to 5 (desired BIA Level of Service Code is 2);
    - have a larger funding need that the BIA may not be able to complete; and
    - have a long stretch of miles that can be worked on (to reduce the overall cost per mile values of the projects selected).

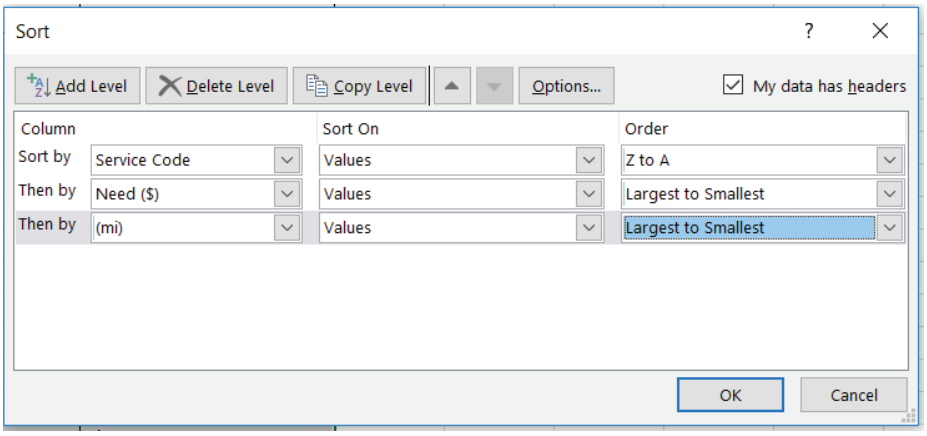


Figure 9 – Step 4 Sorting Criteria

  - There are no defined values in which the preferred roadway segments from this step are chosen. For this iteration, we went ahead and chose a minimum Maintenance Need ($) amount of $40,000 and a minimum length of road of 5 miles. The roadway segments that met these desired amounts were highlighted and are shown in Table 3. The total cost for Maintenance Deferred on these particular roadway segments (totaling 665 miles) is $2.7M.
    - It should be noted that the dollar amounts listed in the DMR are for the entire roadway and not just the pavement surface.
- The 4th Quarter DMR Table 3 was then reviewed against the RIFDs data to determine if the road segment is located in both sets of data. The RIFDs data and DMR table was then highlighted in green to identify the matching values. As this step was being done, it was noted that there were several duplicate roadway numbers (one each in the Type 4/5 Surface Codes) in the DMR data.
- Applying the RIFDs data filter to the DMR data reduced the number of road segments to 21.
- The next filter to be applied to the DMR Table 3 was the review against the NDOT TTIP project list for FY 2018 – 2022. Any road segments in the Table that matched a roadway already on the TTIP list were struck out as they would be reconstructed in the next 4 years. This further reduced the number of road segments to 13.
  - Further investigation during the field reviews of several road segments noted that the current TTIP projects may or may not be reconstructing the full length of the roadway, so this last step of removing current TTIP projects is not 100% effective in refining the data set in the future.

Indian Reservation Roads Program - Deferred Maintenance Assessment for Roads
Fiscal Year 2017 / Q4

PMSP Number	Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Deferred ($)	TTIP 2018 - 2022
2	0002	4	5 - Bitumenous > 2"	9.3	4-Poor	$58,590	$58,590	
2	0002	4	4 - Bitumenous < 2"	20.6	3-Fair	$63,345	$63,345	
	~~0004~~	~~4~~	~~4 - Bitumenous < 2"~~	~~22.7~~	~~3-Fair~~	~~$69,803~~	~~$63,659~~	X
4	0005	4	5 - Bitumenous > 2"	15.0	3-Fair	$69,188	$69,188	
4	0005	4	4 - Bitumenous < 2"	11.6	4-Poor	$46,110	$46,110	
6	0007	4	4 - Bitumenous < 2"	15.9	4-Poor	$63,203	$58,402	
7	0009	4	5 - Bitumenous > 2"	29.5	3-Fair	$136,069	$134,172	
7	0009	4	4 - Bitumenous < 2"	37.9	3-Fair	$116,543	$116,543	
	~~0012~~	~~4~~	~~4 - Bitumenous < 2"~~	~~25.8~~	~~5-Failing~~	~~$128,678~~	~~$128,678~~	X
	~~0012~~	~~4~~	~~4 - Bitumenous < 2"~~	~~38.0~~	~~4-Poor~~	~~$151,050~~	~~$145,058~~	X
	~~0013~~	~~4~~	~~5 - Bitumenous > 2"~~	~~36.5~~	~~4-Poor~~	~~$229,950~~	~~$223,541~~	X
	~~0013~~	~~4~~	~~5 - Bitumenous > 2"~~	~~9.4~~	~~3-Fair~~	~~$43,358~~	~~$42,196~~	X
	~~0015~~	~~4~~	~~4 - Bitumenous < 2"~~	~~67.4~~	~~3-Fair~~	~~$207,255~~	~~$186,901~~	X
	~~0027~~	~~4~~	~~5 - Bitumenous > 2"~~	~~14.7~~	~~3-Fair~~	~~$67,804~~	~~$67,599~~	X
	0033	4	4 - Bitumenous < 2"	13.1	3-Fair	$40,283	$39,126	
	~~0035~~	~~4~~	~~4 - Bitumenous < 2"~~	~~22.9~~	~~3-Fair~~	~~$70,418~~	~~$70,418~~	X
	~~0036~~	~~4~~	~~5 - Bitumenous > 2"~~	~~29.0~~	~~5-Failing~~	~~$243,600~~	~~$232,152~~	X
22	0041	4	4 - Bitumenous < 2"	21.3	4-Poor	$84,668	$72,197	
25	0049	4	5 - Bitumenous > 2"	12.0	3-Fair	$55,350	$49,107	
	0054	4	5 - Bitumenous > 2"	9.9	3-Fair	$45,664	$42,675	
	~~0055~~	~~4~~	~~5 - Bitumenous > 2"~~	~~7.5~~	~~5-Failing~~	~~$63,000~~	~~$63,000~~	X
	0059	4	5 - Bitumenous > 2"	20.6	4-Poor	$129,780	$128,149	
28	0060	4	4 - Bitumenous < 2"	25.1	4-Poor	$99,773	$92,193	
	0064	4	4 - Bitumenous < 2"	24.4	3-Fair	$75,030	$70,938	
	~~0251~~	~~4~~	~~4 - Bitumenous < 2"~~	~~29.3~~	~~5-Failing~~	~~$146,134~~	~~$142,297~~	X
	~~0474~~	~~4~~	~~4 - Bitumenous < 2"~~	~~11.9~~	~~5-Failing~~	~~$59,351~~	~~$55,565~~	X
110	3005	4	4 - Bitumenous < 2"	13.9	3-Fair	$42,743	$42,367	
119	4017	4	4 - Bitumenous < 2"	9.7	5-Failing	$48,379	$48,379	
140	4065	4	4 - Bitumenous < 2"	15.3	3-Fair	$47,048	$47,048	
168	5000	4	4 - Bitumenous < 2"	14.2	4-Poor	$56,445	$56,379	
171	5068	4	5 - Bitumenous > 2"	10.6	3-Fair	$48,893	$48,893	
172	5099	4	4 - Bitumenous < 2"	20.2	3-Fair	$62,115	$61,946	
			DMR Totals =	665.2		$2,869,620	$2,766,811	
			DMR – TTIP Projects =	350.1		$1,389,219	$1,345,747	

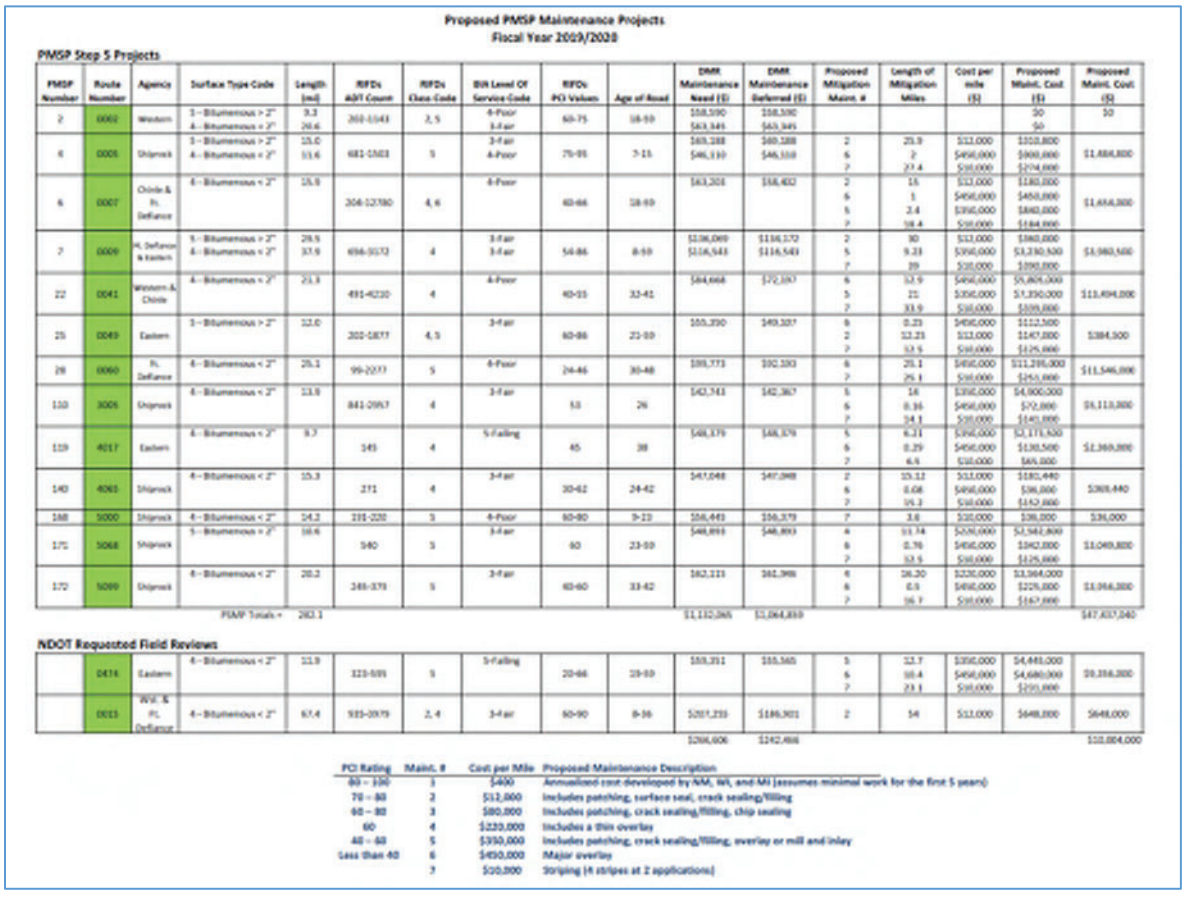
Table 3 – Step 4 BIA DMR Results

Step 5 – Apply the Proposed Mitigation Treatments and Costs to the Preferred Road Segments.

- The table of preferred projects from Step 4 was copied over to a new excel spreadsheet and the following columns of data were added from the RIFDs data:
  - ADT Count
  - Class Code
  - PCI Values
  - Age of Road

  This data was added to aid in the decision making of selecting preferred projects for future TTIP maintenance. Due to the fact that the RIFDs data can have multiple segments with multiple values, the range of data was provided. It should be noted that the DMR and RIFDs data in regards to section lengths and surface type do not match up when comparing road segments between them.

- The next step to producing a DRAFT list of roadway projects entails reviewing the PCI values and the proposed mitigations list to determine which is appropriate and how much the maintenance cost would be using values determined by our research. The proposed mitigations for the DRAFT list were strictly based on the PCI values given in RIFDs. This process cannot be considered complete as we found that the RIFDs PCI values were often incorrect. Table 4 was considered a DRAFT list that was to be field reviewed and finalized.
  - The proposed list of 13 roadway projects has a total of 282 miles and approximately $57M in maintenance costs.



Proposed PMSP Maintenance Projects
Fiscal Year 2019/2020

PMSP Step 5 Projects

PMSP Number	Route Number	Agency	Surface Type Code	Length (mi)	RIFDs ADT Count	RIFDs Class Code	RIFDs Bit Level Of Service Code	RIFDs PCI Values	Age of Road	DMR Maintenance Need ($)	DMR Maintenance Deferred ($)	Proposed Mitigation Maint. #	Length of Mitigation Miles	Cost per mile ($)	Proposed Maint. Cost ($)	Proposed Maint. Cost ($)
2	0002	Western	1 - Bituminous > 2" 4 - Bituminous < 2"	3.3 26.6	202-1043	2, 5	4-Poor 3-Fair	60-75	18-59	$58,590 $63,345	$58,590 $63,345				$0 $0	$0
6	0006	Shiprock	1 - Bituminous > 2" 4 - Bituminous < 2"	15.0 11.6	681-1503	5	3-Fair 4-Poor	75-95	7-15	$69,288 $46,110	$69,288 $46,110	2 6 7	25.9 2 27.4	$12,000 $490,000 $10,000	$310,800 $980,000 $274,000	$1,484,800
6	0007	Chinle & Ft. Defiance	4 - Bituminous < 2"	15.9	204-12780	4, 6	4-Poor	60-66	18-59	$63,201	$58,402	2 6 5 7	15 1 2.4 18.4	$12,000 $490,000 $350,000 $10,000	$180,000 $490,000 $840,000 $184,000	$1,694,000
7	0009	Ft. Defiance & Eastern	1 - Bituminous > 2" 4 - Bituminous < 2"	29.5 37.9	696-3172	4	3-Fair 3-Fair	56-86	8-59	$136,069 $116,543	$136,172 $116,543	2 5 7	30 9.23 39	$12,000 $350,000 $10,000	$360,000 $3,230,500 $390,000	$3,980,500
22	0041	Western & Chinle	4 - Bituminous < 2"	23.3	491-4220	4	4-Poor	40-55	32-41	$64,668	$72,197	6 5 7	12.9 21 33.9	$490,000 $350,000 $10,000	$6,809,000 $7,350,000 $339,000	$13,894,000
25	0049	Eastern	1 - Bituminous > 2"	12.0	202-1877	4, 5	3-Fair	60-86	21-59	$55,350	$49,107	6 2 7	0.23 12.23 12.5	$490,000 $12,000 $10,000	$112,500 $147,000 $125,000	$384,500
28	0060	Ft. Defiance	4 - Bituminous < 2"	25.1	99-2237	5	4-Poor	24-46	30-48	$99,773	$92,330	6 7	25.1 25.1	$490,000 $10,000	$11,299,000 $251,000	$11,546,000
110	3005	Shiprock	4 - Bituminous < 2"	13.9	841-2967	4	3-Fair	51	26	$42,743	$42,367	5 6 7	16 0.16 14.1	$350,000 $490,000 $10,000	$4,900,000 $72,000 $140,000	$5,113,000
119	4017	Eastern	4 - Bituminous < 2"	9.7	145	4	5-Failing	45	38	$48,379	$48,379	5 6 7	6.21 0.29 6.5	$350,000 $490,000 $10,000	$2,171,500 $130,500 $65,000	$2,369,000
140	4061	Shiprock	4 - Bituminous < 2"	15.3	271	4	3-Fair	30-42	24-42	$47,048	$47,048	2 6 7	15.12 0.08 15.2	$12,000 $490,000 $10,000	$181,440 $36,000 $142,000	$359,440
168	5000	Shiprock	4 - Bituminous < 2"	14.2	191-220	5	4-Poor	60-80	9-21	$56,443	$56,379	7	3.8	$10,000	$38,000	$38,000
171	5068	Shiprock	1 - Bituminous > 2"	18.6	540	5	3-Fair	60	23-59	$48,893	$48,893	4 6 7	11.74 0.76 12.5	$250,000 $490,000 $10,000	$2,562,800 $362,000 $125,000	$3,049,800
172	5099	Shiprock	4 - Bituminous < 2"	20.2	346-379	5	3-Fair	60-60	33-42	$62,111	$62,366	4 6 7	16.20 0.3 16.7	$230,000 $490,000 $10,000	$3,364,000 $229,000 $167,000	$3,964,000
			PMP Totals =	282.1						$1,112,265	$1,064,859					$47,437,040

NDOT Requested Field Reviews

	0474	Eastern	4 - Bituminous < 2"	11.9	323-595	5	5-Failing	20-66	10-59	$59,351	$55,565	5 6 7	12.7 10.4 23.1	$350,000 $490,000 $10,000	$4,445,000 $4,680,000 $231,000	$9,356,000
	0003	Wid. & Ft. Defiance	4 - Bituminous < 2"	67.4	935-3979	2, 4	3-Fair	60-90	8-36	$207,233	$186,301	2	54	$12,000	$648,000	$648,000
										$266,606	$242,466					$10,004,000

PCI Rating	Maint. #	Cost per Mile	Proposed Maintenance Description
80 – 100	1	$400	Annualized cost developed by NM, WI, and MI (assumes minimal work for the first 5 years)
70 – 80	2	$12,000	Includes patching, surface seal, crack sealing/filling
60 – 80	3	$80,000	Includes patching, crack sealing/filling, chip sealing
60	4	$220,000	Includes a thin overlay
40 – 60	5	$350,000	Includes patching, crack sealing/filling, overlay or mill and inlay
Less than 40	6	$490,000	Major overlay
	7	$10,000	Striping (4 stripes at 2 applications)

Table 4 – Step 5, DRAFT list of roadway projects with proposed maintenance types

- The final piece to completing Step 5 consisted of conducting a field review of the proposed 13 roadway projects to determine if the RIFDs data was accurate, take photos of current conditions and provide a more refined mitigation for consideration. This process is further described and final recommendations are provided in section 3.2.

Step 6 – Review of Proposed Roadway projects with NDOT and BIA Staff to determine final list for FY 2019 and FY 2020.

- Step 6 entails conducting a review of the proposed project list with NDOT and BIA staff to determine project feasibility and verify the proper mitigation measure was selected. This review occurred on November 13, 2018.
- The prioritization criteria for the final project list was determined to be the following:
  - Bus routes – projects that were bus routes had higher priority.
  - BIA Level of Service Code – projects having a Level of Service code of 5-Failing had higher priority than the ones with 4-Poor and 3-Fair ratings.
  - ADT count – the higher ADT counts had higher priority.

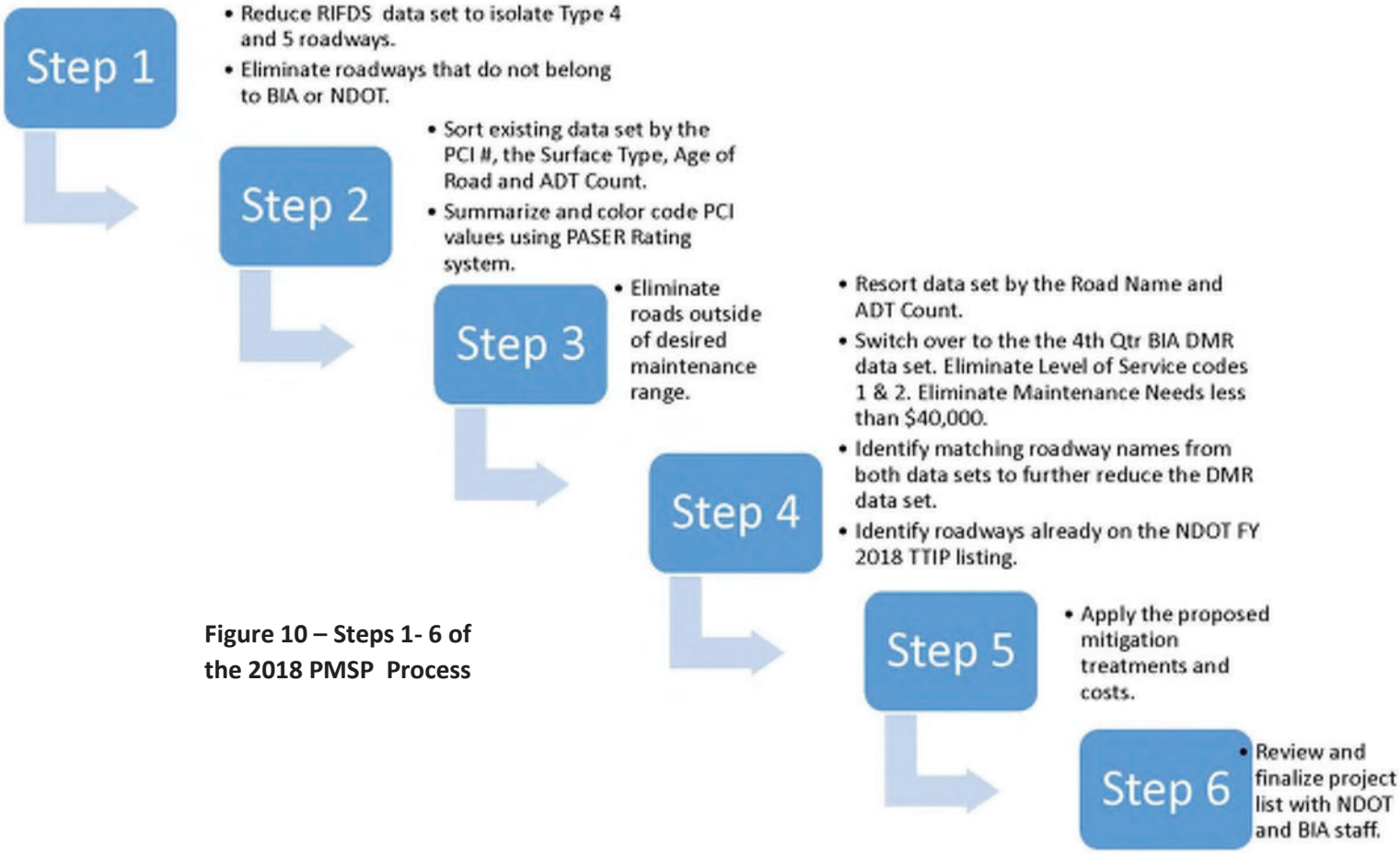


Figure 10 – Steps 1- 6 of the 2018 PMSP Process

- In an effort to verify the PMSP roadway selection process, a backcheck of the process was completed using the new RIFDs dataset that NDOT Planning Department provided in November 2018. This backcheck was completed while creating Table 7 of the report.
    - Garret Silversmith requested that Wilson & Company develop Table 7 – Listing of 4/5 Roads for the PMSP as it provides what is considered a full listing of the Type 4/5 roadways within the RIFDs database. The goal of providing Table 7 was to show the entire list of type 4/5 roadways and a reason as to why each roadway was not selected for potential maintenance. The reasons for not selecting a roadway are shown below.
        - PCI Value too Low (0-29)
        - PCI Value too High (80-100)
        - Road not owned/maintained by BIA or NDOT
        - Road not located on the BIA DMR list
        - BIA DMR Level of Service was 1 or 2 (acceptable)
        - BIA DMR Mntc. Need less than $40,000
        - BIA DMR Length of Road less than 5 miles
    - Based on the creation of Table 7, several roadways (N2, N5, N7, N9, N15, N49, N5068) were noted as having a section of the roadway with a PCI value equal to zero (0), which could have possibly eliminated it in the earlier version of the dataset. There were most likely sections in the RIFDs database with the appropriate PCI values, but the sorting and condensing of the data rows isolated the lowest PCI value row for the backcheck.
        - These types of dataset issues need to be resolved in the RIFDs database so the sorting criteria process is refining the data correctly.
    - A single roadway project (N251) managed to meet all the original criteria for potential project selection. This roadway was not field reviewed, therefore a proposed mitigation effort is not possible, but it should be reviewed as a potential future maintenance project along with the other ones.

Timeframes

The timeframe to complete the steps above was approximately 12 months. Steps 1-4 only took approximately 2-3 weeks once the data was collected from NDOT Planning and the BIA. In completing Step 5, Wilson & Company conducted field reviews of the selected roadway projects and determined what the proposed mitigations would be. The overall timeframe to complete this field review effort was dependent on the workload of the field reviewer and was delayed repeatedly due to conflicting task assignments. This step in the process would probably have taken about 3-4 weeks to complete without interruptions. The final Step 6 process timeframe was contingent on NDOT's feedback and the requested revisions (approximately 3-4 weeks). Should this same six-step process be followed for future PMSP reports, it would be reasonable to accommodate a 10-12 week schedule for completion.

These timeframes do not account for any time to collect RIFDs PCI values or any other data to be used in the process. Data collection for the entire roadway network is dependent on the type of data collection and the number of individuals assigned to complete the effort. One could safely assume that a full-blown roadway data collection (manual effort) using several teams would take upwards of six to eight months to complete.

3.2. Field Reviews

Once the Pavement Maintenance Priorities were identified using the Step 1 to Step 4 screening criteria, Step 5 entailed determining and applying appropriate mitigation treatments and costs. In order to effectively understand the pavement conditions and determine the appropriate mitigation, a field review of each project corridor was conducted. The field review consisted of driving the project length, taking photos and documenting the current condition of the pavement. The results of these field reviews are contained in Appendix A of the report.

During the field review process, several additional roadways were noted and/or recommended for inclusion into the report. Darryl Bradley, NDOT's Principal Civil Engineer, and Herby Larsen from the BIA both recommended the following sections of road be reviewed.

- N15 - 54 mile section from AZ 99 east to just past Indian Wells (at the N6 intersection)
- N474 - 23.1 mile stretch of paved road from the NM 197 intersection north past Ojo Encino

Several additional paved roads were noted by the BIA or during field reviews as needing mitigation efforts and should be considered as potential candidates for future reviews.

- N251 – near Tselani
- N36 – from Shiprock east to Farmington
- N112 – from St. Michaels north to Ft. Defiance
- N20 – from US 89 intersection north to Lechee
- N35 – from the AZ 160 intersection north to the UT/AZ state line
- N34 – from the US 491 intersection west to Sanostee
- N3003 (also known as CR 7010) – from the N4095 intersection east to US 550

Table 5 on the next page is the result of refining Table 4 after the field reviews. The field reviews noted multiple cases of PCI data in RIFDs that was inaccurate, which in turn changed the proposed mitigation efforts. PMSP Number 2 (N0002) was not given a proposed mitigation or priority ranking based on the information provided that the Hopi Reservation was in charge of maintaining the paved section of roadway.

3.3. Recommendations for Implementation

The following Table 5 represents the results of Steps 1 to 5 as previously discussed and the proposed pavement maintenance projects that NDOT should consider for FY 2019/FY 2020 and beyond. The projects were given a priority ranking based on the following guidelines:

- Bus routes – projects that were bus routes had higher priority.
- BIA Level of Service Code – projects having a Level of Service code of 5-Failing had higher priority than the ones with 4-Poor and 3-Fair ratings.
- ADT count – the higher ADT counts had higher priority.

Table 6 was prepared using the information from Table 5 and the proposed mitigation efforts as described in the field reviews in Appendix A. The projects were reordered based on NDOT's priority ranking and a proposed FY was given for implementation. Figure 11 was created to provide a visual graphic of the project locations and their proposed maintenance mitigations.

Recommendations: Based on the information provided, the interviews conducted and the field reviews completed, Wilson & Company recommends that the following items be reviewed and considered by NDOT for implementation.

- Dedicate approximately $8.25 - $9.0 million of TTP funding per fiscal year to the preservation and maintenance of existing paved roadways within the NDOT and BIA system. This funding amount is based on the 25% CFR limitation for using TTP funding on maintenance activities and NDOT being able to continue funding their Roads Department activities at their current level (refer to section 1.4 for full explanation).
    - Pavement preservation research strongly encourages the implementation of pavement maintenance activities to extend the life of the roadway and saves on future reconstruction costs should the investment not be made.
    - The dedication of this funding also meets the #1 Navajo Nation LRTP goal of *Take Care of the System*.
    - Based on the length of the roads and the current state of disrepair they are in, several of the proposed pavement maintenance projects will require more funding than what is available in a fiscal year. This will require NDOT to dedicate additional funding from other sources to complete them.
    - As is the case on the Navajo Nation, the current paved roadway system maintenance needs greatly outweigh the available funding from FHWA. NDOT should look into supplementing this funding amount with FET and/or PTF opportunities as approved through the RDC.

- Implement the proposed mitigation/maintenance activities as described in Tables 5 and 6 below. The tables provide a priority ranking and potential fiscal year for implementation based on the funding amounts available. The projects will essentially utilize the TTP maintenance funding for FY 2019-2025.
    - It should be noted that the existing pavement conditions and priorities of these projects may change over the years as each roadway may deteriorate differently based on location, weather and traffic use.
    - Several additional project corridors were identified by BIA and NDOT staff while this report was being prepared. Two additional corridors (N15 and N474) were field reviewed and included in the ranking. The other projects listed in section 3.2 above should be field reviewed and included for future consideration as funding allows.

- Once NDOT has determined a maintenance project is to be added to the upcoming fiscal year TTP, it is recommended that a 2-day scoping effort on the project be completed. This scoping effort should be conducted with Joe Peterman of the Roads Department to verify the mitigation scope and define the limits of the noted distress areas and pothole repairs. This will allow for a more refined estimate of construction costs.

- NDOT should consider implementing a full PMSP based on the Steps in Chapter 2.
  - The steps completed as part of this report are described in Chapter 3 and can be considered an extremely simplified version of a full PMSP.
  - The initial attempt at managing the pavement condition data should be done via a spreadsheet. Once the data for the 1612 miles of paved roadway is collected (see next bullet), then the information can be imported into a more sophisticated pavement management software. The current software recommended to be used at this time is PAVER.

- Develop and maintain a process of collecting paved roadway existing conditions data that becomes the basis of the future pavement maintenance selection process. Having good data on your pavement conditions will allow NDOT to make solid decisions on the timing of proposed mitigation efforts and will maximize the life of their investments.
  - The RIFDs database is a good source for most of this information, but it will need to be supplemented and updated to make it effective. The method of collection and sorting this data will need to be determined (refer to sections 1.5 and 2.1.2 for full discussion). The pavement data collection process should be considered as part of NDOT's overall asset management plan, which is an FHWA requirement.

  Data to be collected consists of:

  (Highlighted data = NDOT already has all or part of this data already collected in the RIFDs database.)
  - Roadway Name – Roadway name and any corresponding numeric references
  - Pavement Location – Physical reference to the location, including BOP/EOP mileposts.
  - Pavement Dimensions – Values including length, width, and/or area
  - Pavement Type – The material that comprises, at a minimum, the pavement surface.
  - Construction History – Details of the latest maintenance and rehabilitation treatments and construction date, and, if possible, original construction dates and additional maintenance and rehabilitation records.
  - Functional Classifications – Type of service the roadway was intended to provide (e.g., arterial, collector, or local/residential).
  - Traffic Information – Details on average daily traffic (ADT) and truck traffic.
  - Layer Thicknesses – All the thicknesses of the layers above subgrade.
  - Subgrade Information – Type and material classification.
  - Drainage Characteristics – Occurrence of curb and gutter or ditches and related details.
  - Ownership information – Details on jurisdiction.
  - Shoulder Data – Shoulder type and width.

- NDOT should consider purchasing equipment and training individuals in the Roads Department on how to perform some of the pavement mitigation activities (specifically crack sealing, patching and applying seal coats) along with a pavement marking/striping machine. These activities are crucial in extending the pavement lifespan and preventing further water infiltration and subgrade damage/failures.

- Since the overall BIA maintenance program will remain the same and the DOI-TPA funding will remain in their control, the NDOT PMSP maintenance project recommendations will need to be coordinated with the BIA on a quarterly basis. In an effort to utilize funding to its highest potential, the NDOT PMSP will assign pavement maintenance activities to the BIA in which they already have existing equipment and labor skill sets to complete. NDOT and BIA will have to coordinate the completion of maintenance activities with each other so the independent management systems can be updated appropriately.

Proposed PMSP Maintenance Projects

PMSP Step 5 Projects

PMSP Number	Route Number	Agency	Surface Type Code	Length (mi)	RIFDs ADT Count	RIFDs Class Code	BIA Level Of Service Code	RIFDs PCI Values	Age of Road	DMR Maintenance Need ($)	DMR Maintenance Deferred ($)	Proposed Mitigation Maint. #	Length of Mitigation Miles	Cost per mile ($)	Proposed Maint. Cost ($)	Proposed Maint. Cost ($)
2	0002	Western	5 - Bitumenous > 2" 4 - Bitumenous < 2"	9.3 20.6	202-1143	2, 5	4-Poor 3-Fair	60-75	18-59	$58,590 $63,345	$58,590 $63,345				$0 $0	$0
4	0005	Shiprock	5 - Bitumenous > 2" 4 - Bitumenous < 2"	15.0 11.6	681-1503	5	3-Fair 4-Poor	75-95	7-15	$69,188 $46,110	$69,188 $46,110	2 6 7	25.9 2 27.4	$12,000 $450,000 $10,000	$310,800 $900,000 $274,000	$1,484,800
6	0007	Chinle & Ft. Defiance	4 - Bitumenous < 2"	15.9	204-12780	4, 6	4-Poor	40-66	18-59	$63,203	$58,402	2 6 5 7	15 1 2.4 18.4	$12,000 $450,000 $350,000 $10,000	$180,000 $450,000 $840,000 $184,000	$1,654,000
7	0009	Ft. Defiance & Eastern	5 - Bitumenous > 2" 4 - Bitumenous < 2"	29.5 37.9	656-3172	4	3-Fair 3-Fair	54-86	8-59	$136,069 $116,543	$134,172 $116,543	2 5 7	30 9.23 39	$12,000 $350,000 $10,000	$360,000 $3,230,500 $390,000	$3,980,500
22	0041	Western & Chinle	4 - Bitumenous < 2"	21.3	491-4210	4	4-Poor	40-55	32-41	$84,668	$72,197	6 5 7	12.9 21 33.9	$450,000 $350,000 $10,000	$5,805,000 $7,350,000 $339,000	$13,494,000
25	0049	Eastern	5 - Bitumenous > 2"	12.0	202-1877	4, 5	3-Fair	60-86	21-59	$55,350	$49,107	6 2 7	0.25 12.25 12.5	$450,000 $12,000 $10,000	$112,500 $147,000 $125,000	$384,500
28	0060	Ft. Defiance	4 - Bitumenous < 2"	25.1	99-2277	5	4-Poor	24-46	30-48	$99,773	$92,193	6 7	25.1 25.1	$450,000 $10,000	$11,295,000 $251,000	$11,546,000
110	3005	Shiprock	4 - Bitumenous < 2"	13.9	841-2957	4	3-Fair	53	26	$42,743	$42,367	5 6 7	14 0.16 14.1	$350,000 $450,000 $10,000	$4,900,000 $72,000 $141,000	$5,113,000
119	4017	Eastern	4 - Bitumenous < 2"	9.7	145	4	5-Failing	45	38	$48,379	$48,379	5 6 7	6.21 0.29 6.5	$350,000 $450,000 $10,000	$2,173,500 $130,500 $65,000	$2,369,000
140	4065	Shiprock	4 - Bitumenous < 2"	15.3	271	4	3-Fair	30-62	24-42	$47,048	$47,048	2 6 7	15.12 0.08 15.2	$12,000 $450,000 $10,000	$181,440 $36,000 $152,000	$369,440
168	5000	Shiprock	4 - Bitumenous < 2"	14.2	191-220	5	4-Poor	60-80	9-23	$56,445	$56,379	7	3.6	$10,000	$36,000	$36,000
171	5068	Shiprock	5 - Bitumenous > 2"	10.6	540	5	3-Fair	60	23-59	$48,893	$48,893	4 6 7	11.74 0.76 12.5	$220,000 $450,000 $10,000	$2,582,800 $342,000 $125,000	$3,049,800
172	5099	Shiprock	4 - Bitumenous < 2"	20.2	245-379	5	3-Fair	40-60	33-42	$62,115	$61,946	4 6 7	16.20 0.5 16.7	$220,000 $450,000 $10,000	$3,564,000 $225,000 $167,000	$3,956,000
			PSMP Totals =	282.1						$1,132,065	$1,064,859					$47,437,040

NDOT Requested Field Reviews

	0474	Eastern	4 - Bitumenous < 2"	11.9	323-595	5	5-Failing	20-66	19-59	$59,351	$55,565	5 6 7	12.7 10.4 23.1	$350,000 $450,000 $10,000	$4,445,000 $4,680,000 $231,000	$9,356,000
	0015	Wst. & Ft. Defiance	4 - Bitumenous < 2"	67.4	935-3979	2, 4	3-Fair	60-90	8-36	$207,255	$186,901	2	54	$12,000	$648,000	$648,000
										$266,606	$242,466					$10,004,000

Table 5 – Step 5, Final list of roadway projects

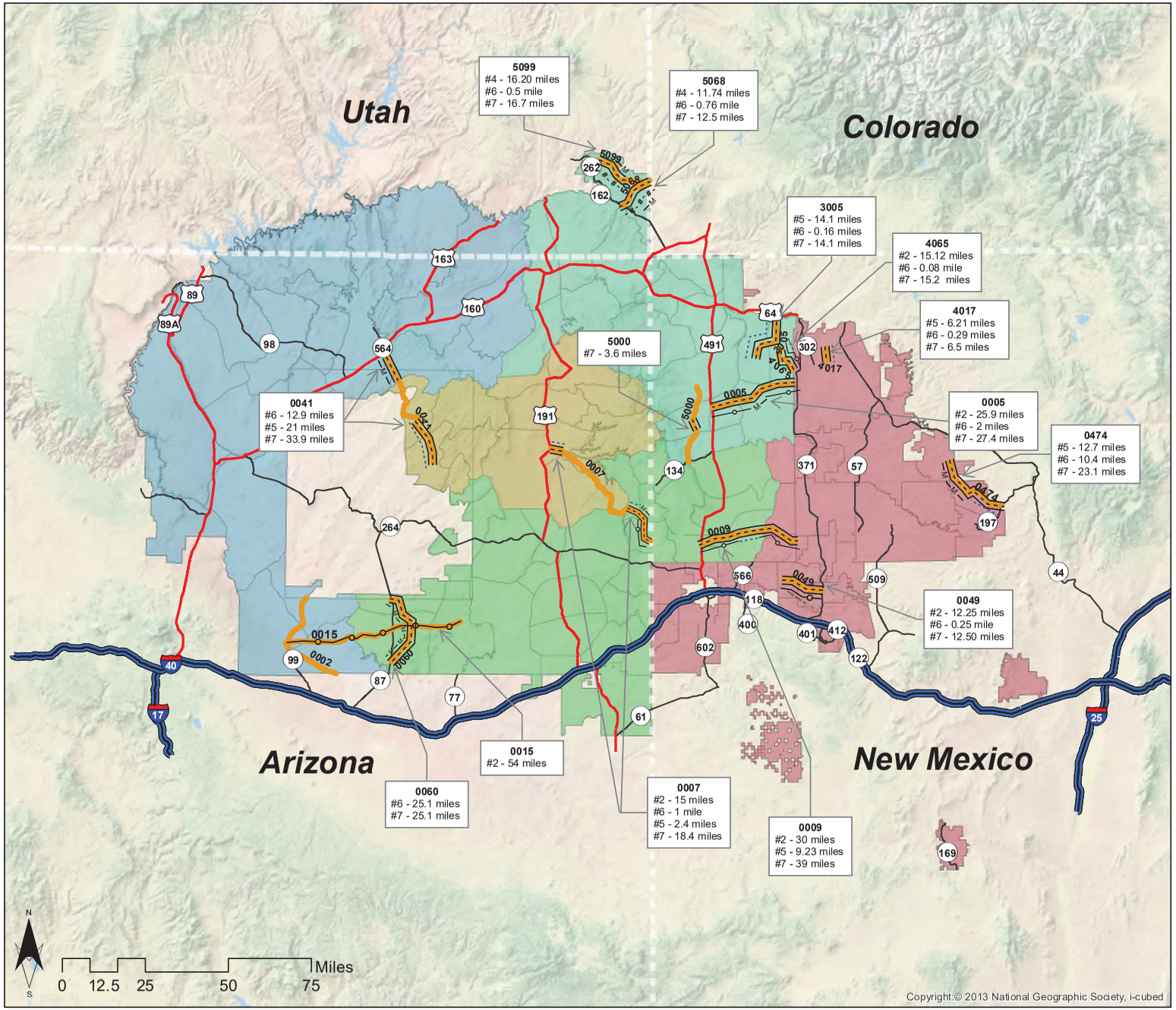
PCI Rating	Maint. #	Cost per Mile	Proposed Maintenance Description
80 – 100	1	$400	Annualized cost developed by NM, WI, and MI (assumes minimal work for the first 5 years)
70 – 80	2	$12,000	Includes patching, surface seal, crack sealing/filling
60 – 80	3	$80,000	Includes patching, crack sealing/filling, chip sealing
60	4	$220,000	Includes a thin overlay
40 – 60	5	$350,000	Includes patching, crack sealing/filling, overlay or mill and inlay
Less than 40	6	$450,000	Major overlay
	7	$10,000	Striping (4 stripes at 2 applications)

Proposed PMSP Maintenance Projects
Fiscal Year 2019/2025

PMSP Step 6 Prioritization of Projects

PMSP Number	Route Number	Agency	RIFDs ADT Count	Bus Route (yes/no)	BIA Level Of Service Code	RIFDs PCI Values	Mitigation Description from Field Review	Proposed Mitigation Maint. #	Length of Mitigation Miles	Cost per mile ($)	Proposed Maint. Cost ($)	Proposed Maint. Cost ($)	Priority Ranking	Proposed FY
	0474	Eastern	323-595	Yes	5-Failing	20-66	Patching and removal and replace the pavement distress areas. Crack seal and minor structure overlay for MP 0 - 12.7. Major overlay of pavement from MP 12.7 – 23.1. Restripe.	5 6 7	12.7 10.4 23.1	$350,000 $450,000 $10,000	$4,445,000 $4,680,000 $231,000	$9,356,000	1	2019
6	0007	Chinle & Ft. Defiance	204-12780	Yes	4-Poor	40-66	Crack seal and seal coat. Patching, mill and major structure overlay. Patching and removal and replace the pavement distress areas. Restripe.	2 6 5 7	15 1 2.4 18.4	$12,000 $450,000 $350,000 $10,000	$180,000 $450,000 $840,000 $184,000	$1,654,000	2	2020
22	0041	Western & Chinle	491-4210	Yes	4-Poor	40-55	Patching, mill and major structure overlay. Patching and removal and replace the pavement distress areas. Minor overlay. Restripe.	6 5 7	12.9 21 33.9	$450,000 $350,000 $10,000	$5,805,000 $7,350,000 $339,000	$13,494,000	3	2021
28	0060	Ft. Defiance	99-2277	Yes	4-Poor	24-46	Patching, repair of distress areas and major structure overlay. Restripe.	6 7	25.1 25.1	$450,000 $10,000	$11,295,000 $251,000	$11,546,000	4	2022
4	0005	Shiprock	681-1503	Yes	3-Fair 4-Poor	75-95	Fog seal. Full depth pavement recycling at the distress areas (assume length 30% of total) Restripe.	2 6 7	25.9 2 27.4	$12,000 $450,000 $10,000	$310,800 $900,000 $274,000	$1,484,800	5	2023
168	5000	Shiprock	191-220	Yes	4-Poor	60-80	Restripe.	7	3.6	$10,000	$36,000	$36,000	6	2023
	0015	Wst. & Ft. Defiance	935-3979	Yes	3-Fair	60-90	Crack sealing, patching and spraying weed killer on the shoulders.	2	54	$12,000	$648,000	$648,000	7	2023
7	0009	Ft. Defiance & Eastern	656-3172	Yes	3-Fair 3-Fair	54-86	Spot patching. Fog seal only. Spot patching and removal and replace the pavement distress areas. Place a minor 2" thick structural overlay and new OGFC. Restripe.	2 5 7	30 9.23 39	$12,000 $350,000 $10,000	$360,000 $3,230,500 $390,000	$3,980,500	8	2023
110	3005	Shiprock	841-2957	Yes	3-Fair	53	Crack seal and minor structure overlay the entire project length. Patching and removal and replace the pavement distress areas. Restripe.	5 6 7	14 0.16 14.1	$350,000 $450,000 $10,000	$4,900,000 $72,000 $141,000	$5,113,000	9	2024
25	0049	Eastern	202-1877	Yes	3-Fair	60-86	Spot patching and removal and replace the pavement distress areas. Crack seal and fog seal the entire project length. Restripe.	6 2 7	0.25 12.25 12.5	$450,000 $12,000 $10,000	$112,500 $147,000 $125,000	$384,500	10	2024
171	5068	Shiprock	540	Yes	3-Fair	60	Microsurface overlay the entire project length. Patching and removal and replace the pavement distress areas. Restripe.	4 6 7	11.74 0.76 12.5	$220,000 $450,000 $10,000	$2,582,800 $342,000 $125,000	$3,049,800	11	2024
172	5099	Shiprock	245-379	Yes	3-Fair	40-60	Microsurface overlay the project length with the exception of MP 14.1 – 17.6. Patching, removal and replace the pavement distress areas and MP 12 – 12.3. Restripe.	4 6 7	16.20 0.5 16.7	$220,000 $450,000 $10,000	$3,564,000 $225,000 $167,000	$3,956,000	12	2025
119	4017	Eastern	145	No	5-Failing	45	Patching, crack seal and minor structure overlay for MP 0 - 6.5. Remove and replace the pavement distress areas. Restripe.	5 6 7	6.21 0.29 6.5	$350,000 $450,000 $10,000	$2,173,500 $130,500 $65,000	$2,369,000	13	2025
140	4065	Shiprock	271	No	3-Fair	30-62	Crack seal and fog seal the entire project length. Apply weed killer to the shoulders. Patching and removal and replace the pavement distress areas. Restripe.	2 6 7	15.12 0.08 15.2	$12,000 $450,000 $10,000	$181,440 $36,000 $152,000	$369,440	14	2025
2	0002	Western	202-1143	Yes	4-Poor 3-Fair	60-75	No maintenance proposed as NDOT is not responsible for this roadway.				$0 $0	$0	NA	NA
	0251	Chinle	212	??	5-Failing	30-68	field review not conducted, but could be a potential project in future.		29.3			$146,134	+ BIA DMR Mntc. Need	

Table 6 – Step 6, Final list of roadway projects with Priority Ranking and proposed Fiscal Year



Navajo Nation

Route Identification

- Chinle Agency
- Eastern Agency
- Fort Defiance Agency
- Shiprock Agency
- Western Ageency
- Chapter Boundary
- Interstate
- US Highway
- State Highway
- BIA Route

	Maintenance #	Proposed Maintenance Description
——o——	2	Includes patching, surface seal, crack sealing/filling
— XX —	3	Includes patching, crack sealing/ filling, chip sealing
- # - # -	4	Includes a thin overlay
-------	5	Includes patching, crack sealing/ filling, overlay or mill and inlay
—M—M—	6	Major Overlay
═══	7	Striping only (4 strips at 2 applications)

Figure 11 - Proposed Projects with Mitigations

Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
BIA ROUTE 0002	4	0	231	Roadway was selected for maintenance
BIA ROUTE 0004	5	0	213	PCI Value too Low (0-29)
BIA ROUTE 0005	4	0	223	Roadway was selected for maintenance
BIA ROUTE 0006	5	62	951	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0007	4	0	1243	Roadway was selected for maintenance
BIA ROUTE 0009	4	0	1224	Roadway was selected for maintenance
BIA ROUTE 0011	4	66		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0012	4	0		PCI Value too Low (0-29)
BIA ROUTE 0013	5	0	1675	PCI Value too Low (0-29)
BIA ROUTE 0015	4	0		Roadway was selected for maintenance
BIA ROUTE 0016	4	0	282	PCI Value too Low (0-29)
BIA ROUTE 0019	5	54	8558	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0020	4	30	93	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0021	4	10		PCI Value too Low (0-29)
BIA ROUTE 0024	4	80	778	PCI Value too High (80-100)
BIA ROUTE 0025	4	50	1289	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0027	4	0		PCI Value too Low (0-29)
BIA ROUTE 0028	4	80	267	PCI Value too High (80-100)
BIA ROUTE 0029	4	42	192	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0030	5	63	589	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0031	4	10	623	PCI Value too Low (0-29)
BIA ROUTE 0033	5	84		PCI Value too High (80-100)
BIA ROUTE 0034	4	41	1057	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0035	4	22	1128	PCI Value too Low (0-29)
BIA ROUTE 0036	4	0	285	PCI Value too Low (0-29)
BIA ROUTE 0039	4	0		PCI Value too Low (0-29)
BIA ROUTE 0041	4	53	1575	Roadway was selected for maintenance
BIA ROUTE 0042	4	30	2311	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0046	4	10	538	PCI Value too Low (0-29)
BIA ROUTE 0048	5	78	370	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0049	4	0		PCI Value too Low (0-29)
BIA ROUTE 0052	4	93	72	PCI Value too High (80-100)
BIA ROUTE 0054	4	0		PCI Value too Low (0-29)
BIA ROUTE 0055	4	0	66	PCI Value too Low (0-29)
BIA ROUTE 0056	4	0		PCI Value too Low (0-29)
BIA ROUTE 0057	4	70	2674	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0059	4	0	7161	PCI Value too Low (0-29)
BIA ROUTE 0060	4	50	1089	Roadway was selected for maintenance
BIA ROUTE 0061	4	30		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0063	4	84	619	PCI Value too High (80-100)
BIA ROUTE 0064	4	6		PCI Value too Low (0-29)
BIA ROUTE 0065	4	68		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0067	4	0	3742	PCI Value too Low (0-29)
BIA ROUTE 0100	4	0		PCI Value too Low (0-29)
BIA ROUTE 0101	4	31		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0102	4	55	1628	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0104	5	62	1955	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0105	4	41	9999	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0106	4	41	71	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0108	4	41	261	BIA DMR Mntc. Need less than $40,000

Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
BIA ROUTE 0110	4	0		PCI Value too Low (0-29)
BIA ROUTE 0112	4	62	271	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0128	4	41	62	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0131	5	90	2073	PCI Value too High (80-100)
BIA ROUTE 0133	4	60	1803	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0151	4	41	301	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0153	4	54	1106	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0157	5	49	5631	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0162	4	30	121	Road not located on the BIA DMR list
BIA ROUTE 0164	4	30		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0172	4	41	127	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0203	4	41	1057	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0221	4	22	523	PCI Value too Low (0-29)
BIA ROUTE 0222	4	0		PCI Value too Low (0-29)
BIA ROUTE 0251	4	30		Possibly should have been a project
BIA ROUTE 0271	5	80	116	PCI Value too High (80-100)
BIA ROUTE 0291	4	41	446	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0321	4	41	301	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0363	4	0	350	PCI Value too Low (0-29)
BIA ROUTE 0364	5	80	3437	PCI Value too High (80-100)
BIA ROUTE 0365	4	0		PCI Value too Low (0-29)
BIA ROUTE 0368	4	95	270	PCI Value too High (80-100)
BIA ROUTE 0368	4	95		PCI Value too High (80-100)
BIA ROUTE 0391	4	53	2230	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0406	4	50	3646	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0474	4	43	285	Roadway was selected for maintenance
BIA ROUTE 0500	4	41	388	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0501	4	41	1028	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0502	4	0	165	PCI Value too Low (0-29)
BIA ROUTE 0503	5	0	305	PCI Value too Low (0-29)
BIA ROUTE 0504	4	85	2342	PCI Value too High (80-100)
BIA ROUTE 0509	4	31		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0510	4	68		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0512	4	44	127	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0513	4	60	1803	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0514	4	50	1313	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0515	4	60	2056	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0519	4	70	342	Road not located on the BIA DMR list
BIA ROUTE 0531	5	31	1341	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0542	4	50	1549	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0543	4	50		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0544	4	60		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0545	4	30	9999	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0546	4	38	170	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0551	4	40		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0552	4	40		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0553	4	35		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0562	4	41	493	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0597	4	66		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0600	4	60	1000	BIA DMR Mntc. Need less than $40,000

Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
BIA ROUTE 0601	4	40		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0602	4	53	2957	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0603	4	62	323	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0606	4	0		PCI Value too Low (0-29)
BIA ROUTE 0607	4	0		PCI Value too Low (0-29)
BIA ROUTE 0608	4	20	2431	PCI Value too Low (0-29)
BIA ROUTE 0609	4	38	212	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0610	4	48	192	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0612	4	48	147	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0613	5	47	2001	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0614	4	42	462	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0615	4	42	462	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0616	4	42	212	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0617	4	46	547	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0618	4	46	206	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0693	4	58	1632	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0701	5	70	560	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0703	4	68		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0704	4	45	1632	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0705	4	60		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0706	4	50		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 0716	5	90	242	PCI Value too High (80-100)
BIA ROUTE 0803	4	41	261	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0804	4	50		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0806	4	50	1019	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 0810	4	30	415	Road not located on the BIA DMR list
BIA ROUTE 1011	4	46		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 1013	5	0	1800	PCI Value too Low (0-29)
BIA ROUTE 1015	4	0		PCI Value too Low (0-29)
BIA ROUTE 1017	5	36	886	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 1040	4	22	1107	PCI Value too Low (0-29)
BIA ROUTE 1041	4	80		PCI Value too High (80-100)
BIA ROUTE 1042	5	84	2148	PCI Value too High (80-100)
BIA ROUTE 1043	4	30		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 1044	4	88	1195	PCI Value too High (80-100)
BIA ROUTE 1045	5	65	269	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 1046	5	70	1205	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 1047	4	90	1059	PCI Value too High (80-100)
BIA ROUTE 1048	5	90	4078	PCI Value too High (80-100)
BIA ROUTE 113	4	45	261	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 1370	4	50	507	Road not located on the BIA DMR list
BIA ROUTE 3002	4	95	1155	PCI Value too High (80-100)
BIA ROUTE 3003	4	0	2543	PCI Value too Low (0-29)
BIA ROUTE 3005	4	66	456	Roadway was selected for maintenance
BIA ROUTE 4001	4	62	656	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4002	5	66	2786	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4003	4	62	656	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4005	4	65	11882	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4006	5	49	5848	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4007	4	62	656	BIA DMR Mntc. Need less than $40,000

Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
BIA ROUTE 4011	4	68	1708	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4014	5	60	540	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4017	4	60	3083	Roadway was selected for maintenance
BIA ROUTE 4018	4	52	127	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4022	4	53	1543	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4028	4	58		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4030	5	60	951	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4035	4	60	3109	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4040	4	68		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4043	4	43		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4045	4	50	836	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4047	5	49	1254	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4049	4	50	470	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4050	4	60		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4055	4	24	269	PCI Value too Low (0-29)
BIA ROUTE 4056	4	50	192	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4057	4	58	404	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4059	4	58	404	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4060	4	50	182	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4061	5	60	684	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4062	4	0	366	PCI Value too Low (0-29)
BIA ROUTE 4063	4	58	1331	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4064	4	60	656	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4065	4	44	285	Roadway was selected for maintenance
BIA ROUTE 4066	5	67		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4067	4	60	323	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4068	4	58	226	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4069	4	41	388	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4070	4	60	191	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4072	4	58	269	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4073	4	50	192	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4077	4	60		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4078	4	27	3351	PCI Value too Low (0-29)
BIA ROUTE 4080	4	58	268	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4081	4	58	226	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4082	4	41	446	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4083	4	43		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4085	4	50	182	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4087	5	70	275	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4093	4	45		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4095	4	70	2674	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4100	4	60		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4101	4	50	1380	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 4103	4	41	285	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4104	5	60	742	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4109	4	60	1803	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4111	4	50	182	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4121	4	60		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4123	4	60		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4140	4	41	388	BIA DMR Mntc. Need less than $40,000

Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
BIA ROUTE 4142	4	41	77	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 4145	4	0	1320	PCI Value too Low (0-29)
BIA ROUTE 4146	4	0		PCI Value too Low (0-29)
BIA ROUTE 4150	4	0	205	PCI Value too Low (0-29)
BIA ROUTE 4154	4	0	343	PCI Value too Low (0-29)
BIA ROUTE 4155	4	0	376	PCI Value too Low (0-29)
BIA ROUTE 4156	4	0	543	PCI Value too Low (0-29)
BIA ROUTE 4164	4	0	302	PCI Value too Low (0-29)
BIA ROUTE 4178	4	0		PCI Value too Low (0-29)
BIA ROUTE 5000	4	68	273	Roadway was selected for maintenance
BIA ROUTE 5010	4	20	272	PCI Value too Low (0-29)
BIA ROUTE 5018	4	68	273	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 5031	4	95	1155	PCI Value too High (80-100)
BIA ROUTE 5060	4	40	987	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 5068	4	0		PCI Value too Low (0-29)
BIA ROUTE 5080	5	86	1644	PCI Value too High (80-100)
BIA ROUTE 5099	4	50		Roadway was selected for maintenance
BIA ROUTE 5112	4	86	604	PCI Value too High (80-100)
BIA ROUTE 5114	4	0		PCI Value too Low (0-29)
BIA ROUTE 6001	4	60	709	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 6002	4	42	212	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 6003	4	42	212	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 6141	4	48	399	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 6150	4	31		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 6331	4	0		PCI Value too Low (0-29)
BIA ROUTE 6410	4	30		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 6460	4	31	206	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 6461	4	41	261	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 6720	4	30		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 7044	4	41	285	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 7046	4	90	1093	PCI Value too High (80-100)
BIA ROUTE 7057	4	66		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 7062	4	60	323	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 7120	4	0		PCI Value too Low (0-29)
BIA ROUTE 7140	4	66		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 7273	4	30		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 8027	5	82	994	PCI Value too High (80-100)
BIA ROUTE 8030	5	80	7341	PCI Value too High (80-100)
BIA ROUTE 8031	5	82	420	PCI Value too High (80-100)
BIA ROUTE 8066	4	30		BIA DMR Mntc. Need less than $40,000
BIA ROUTE 8077	4	30		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 8078	4	30		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA ROUTE 8094	4	0	257	PCI Value too Low (0-29)
BIA ROUTE 9001	4	80	733	PCI Value too High (80-100)
BIA ROUTE 9010	4	86	2284	PCI Value too High (80-100)
BIA ROUTE 9031	4	41	178	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 9101	4	0	1143	PCI Value too Low (0-29)
BIA ROUTE 9202	4	46	1725	BIA DMR Mntc. Need less than $40,000
BIA ROUTE 9345	4	80	263	PCI Value too High (80-100)
BIA ROUTE 9402	4	40	94	BIA DMR Mntc. Need less than $40,000

Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
BIA ROUTE N8066	4	30		BIA DMR Mntc. Need less than $40,000
BIA RTE 2002	4	55	3169	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2003	4	55	491	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2004	4	55	4210	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2005	4	54	951	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2006	4	54	358	BIA DMR Mntc. Need less than $40,000
BIA RTE 2007	4	60	3109	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2009	4	55	2616	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2011	4	70		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2012	4	50	3646	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2015	5	47	269	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2016	4	47	1725	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2017	4	55	3067	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2018	4	55	3053	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2020	4	50	1866	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2021	4	51		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2025	5	62	2768	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2030	5	58	2967	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2302	4	70	322	BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2305	4	70		BIA DMR Mntc. Need less than $40,000
BIA RTE 2306	4	70		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2309	4	70	2925	BIA DMR Mntc. Need less than $40,000
BIA RTE 2312	4	50	1866	Road not located on the BIA DMR list
BIA RTE 2316	5	80	1790	PCI Value too High (80-100)
BIA RTE 2317	4	70		BIA DMR Level of Service was 1 or 2 (acceptable)
BIA RTE 2318	4	48		BIA DMR Mntc. Need less than $40,000
BIA RTE 2320	4	50	1866	Road not located on the BIA DMR list
FM BIA ROUTE 0100	4	41	87	BIA DMR Mntc. Need less than $40,000
FM BIA ROUTE 0502	4	41	1057	BIA DMR Mntc. Need less than $40,000
FM BIA ROUTE 0504	5	36	496	BIA DMR Mntc. Need less than $40,000
FM BIA ROUTE 100	4	30		BIA DMR Mntc. Need less than $40,000
FM BIA ROUTE 9345	4	68	273	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0109	4	30		BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0130	4	41	261	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0132	4	41		BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0136	4	41	301	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0137	4	41	301	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0138	4	41	301	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0203	4	31	614	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0303	4	40	1157	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0501	4	41	301	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0601	4	31	206	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0604	4	31	206	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0702	4	40		BIA DMR Mntc. Need less than $40,000
FM BIA RTE 0801	4	41	3602	BIA DMR Mntc. Need less than $40,000
FM BIA RTE 1017	4	30		BIA DMR Mntc. Need less than $40,000
PUB SCH RTE 1017	4	41	9999	BIA DMR Mntc. Need less than $40,000
ROUTE 2011	5	76	2897	BIA DMR Level of Service was 1 or 2 (acceptable)
ROUTE 2303	4	80		PCI Value too High (80-100)
ROUTE 2304	4	80		PCI Value too High (80-100)

Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
ROUTE 2311	5	72	2241	BIA DMR Level of Service was 1 or 2 (acceptable)
ROUTE 2315	5	75	675	BIA DMR Level of Service was 1 or 2 (acceptable)
SAN JUAN CTY 0406	5	75	4078	Road not owned/maintained by BIA or NDOT
SAN JUAN CTY 0446	5	75	2821	Road not owned/maintained by BIA or NDOT
SAN JUAN CTY 6675	5	75	2731	Road not owned/maintained by BIA or NDOT
SAN JUAN CTY 7100	5	75		Road not owned/maintained by BIA or NDOT
SANDOVAL CTY 0474	5	75		Road not owned/maintained by BIA or NDOT
SANDOVAL CTY 1272	5	75		Road not owned/maintained by BIA or NDOT
STATE ROAD 66	5	75		Road not owned/maintained by BIA or NDOT
TRIBAL ROUTE 0100	4	41	301	Road not located on the BIA DMR list
TRIBAL RTE 0041	4	53	2230	Road not located on the BIA DMR list
TRIBAL RTE 0042	4	68	273	Road not located on the BIA DMR list
TRIBAL RTE 0062	4		72	PCI Value too Low (0-29)
TRIBAL RTE 0101	4	31		Road not located on the BIA DMR list
TRIBAL RTE 0104	5	33	886	Road not located on the BIA DMR list
TRIBAL RTE 0105	4	33		Road not located on the BIA DMR list
TRIBAL RTE 0106	4	30		Road not located on the BIA DMR list
TRIBAL RTE 0107	4	35	5766	Road not located on the BIA DMR list
TRIBAL RTE 0108	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0110	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0111	4	38		Road not located on the BIA DMR list
TRIBAL RTE 0112	4	38		Road not located on the BIA DMR list
TRIBAL RTE 0113	4	38	307	Road not located on the BIA DMR list
TRIBAL RTE 0115	5	40	1675	Road not located on the BIA DMR list
TRIBAL RTE 0116	4	30		Road not located on the BIA DMR list
TRIBAL RTE 0128	4	41		Road not located on the BIA DMR list
TRIBAL RTE 0139	5	40	1168	Road not located on the BIA DMR list
TRIBAL RTE 0140	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0142	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0145	4	41	182	Road not located on the BIA DMR list
TRIBAL RTE 0200	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0201	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0202	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0204	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0205	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0206	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0207	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0222	4	0		PCI Value too Low (0-29)
TRIBAL RTE 0267	4	41	84	Road not located on the BIA DMR list
TRIBAL RTE 0268	4	41	77	Road not located on the BIA DMR list
TRIBAL RTE 0275	4	63	314	Road not located on the BIA DMR list
TRIBAL RTE 0276	4	63	280	Road not located on the BIA DMR list
TRIBAL RTE 0278	5	54	952	Road not located on the BIA DMR list
TRIBAL RTE 0300	4	40	5766	Road not located on the BIA DMR list
TRIBAL RTE 0301	4	41	446	Road not located on the BIA DMR list
TRIBAL RTE 0303	4	63	280	Road not located on the BIA DMR list
TRIBAL RTE 0320	5	54	5359	Road not located on the BIA DMR list
TRIBAL RTE 0357	4	41	446	Road not located on the BIA DMR list
TRIBAL RTE 0400	4	31		Road not located on the BIA DMR list
TRIBAL RTE 0401	4	35		Road not located on the BIA DMR list

Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
TRIBAL RTE 0402	4	35		Road not located on the BIA DMR list
TRIBAL RTE 0403	4	30		Road not located on the BIA DMR list
TRIBAL RTE 0404	4	36	337	Road not located on the BIA DMR list
TRIBAL RTE 0405	4	30	9999	Road not located on the BIA DMR list
TRIBAL RTE 0440	4	41		Road not located on the BIA DMR list
TRIBAL RTE 0452	4	45	197	Road not located on the BIA DMR list
TRIBAL RTE 0500	4	30		Road not located on the BIA DMR list
TRIBAL RTE 0502	5	70	1540	Road not located on the BIA DMR list
TRIBAL RTE 0503	5	0		PCI Value too Low (0-29)
TRIBAL RTE 0505	4	36	297	Road not located on the BIA DMR list
TRIBAL RTE 0506	4	38	212	Road not located on the BIA DMR list
TRIBAL RTE 0510	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0515	4	40	14062	Road not located on the BIA DMR list
TRIBAL RTE 0516	5	70	1727	Road not located on the BIA DMR list
TRIBAL RTE 0517	4	60		Road not located on the BIA DMR list
TRIBAL RTE 0518	4	30		Road not located on the BIA DMR list
TRIBAL RTE 0522	4	40	1000	Road not located on the BIA DMR list
TRIBAL RTE 0523	4	38	144	Road not located on the BIA DMR list
TRIBAL RTE 0524	4	40	379	Road not located on the BIA DMR list
TRIBAL RTE 0525	4	31	614	Road not located on the BIA DMR list
TRIBAL RTE 0526	4	36		Road not located on the BIA DMR list
TRIBAL RTE 0527	4	30		Road not located on the BIA DMR list
TRIBAL RTE 0539	4	43		Road not located on the BIA DMR list
TRIBAL RTE 0540	4	43		Road not located on the BIA DMR list
TRIBAL RTE 0548	4	40	9999	Road not located on the BIA DMR list
TRIBAL RTE 0549	4	50		Road not located on the BIA DMR list
TRIBAL RTE 0552	5	54	9999	Road not located on the BIA DMR list
TRIBAL RTE 0591	5	82	2262	PCI Value too High (80-100)
TRIBAL RTE 0600	4	38		Road not located on the BIA DMR list
TRIBAL RTE 0603	4	40	277	Road not located on the BIA DMR list
TRIBAL RTE 0604	4	38	103	Road not located on the BIA DMR list
TRIBAL RTE 0605	6	0	360	PCI Value too Low (0-29)
TRIBAL RTE 0606	5	40	174	Road not located on the BIA DMR list
TRIBAL RTE 0607	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0608	4	45	145	Road not located on the BIA DMR list
TRIBAL RTE 0700	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0701	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0703	4	31	1695	Road not located on the BIA DMR list
TRIBAL RTE 0704	4	38	103	Road not located on the BIA DMR list
TRIBAL RTE 0705	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0706	4	40		Road not located on the BIA DMR list
TRIBAL RTE 0707	4	31	183	Road not located on the BIA DMR list
TRIBAL RTE 0708	4	40	2033	Road not located on the BIA DMR list
TRIBAL RTE 0709	4	40	1574	Road not located on the BIA DMR list
TRIBAL RTE 0800	4	31	173	Road not located on the BIA DMR list
TRIBAL RTE 1047	5	94	900	PCI Value too High (80-100)
TRIBAL RTE 1125	4	41	388	Road not located on the BIA DMR list
TRIBAL RTE 1127	4	40	767	Road not located on the BIA DMR list
TRIBAL RTE 1130	4	40	709	Road not located on the BIA DMR list
TRIBAL RTE 1131	4	40	277	Road not located on the BIA DMR list

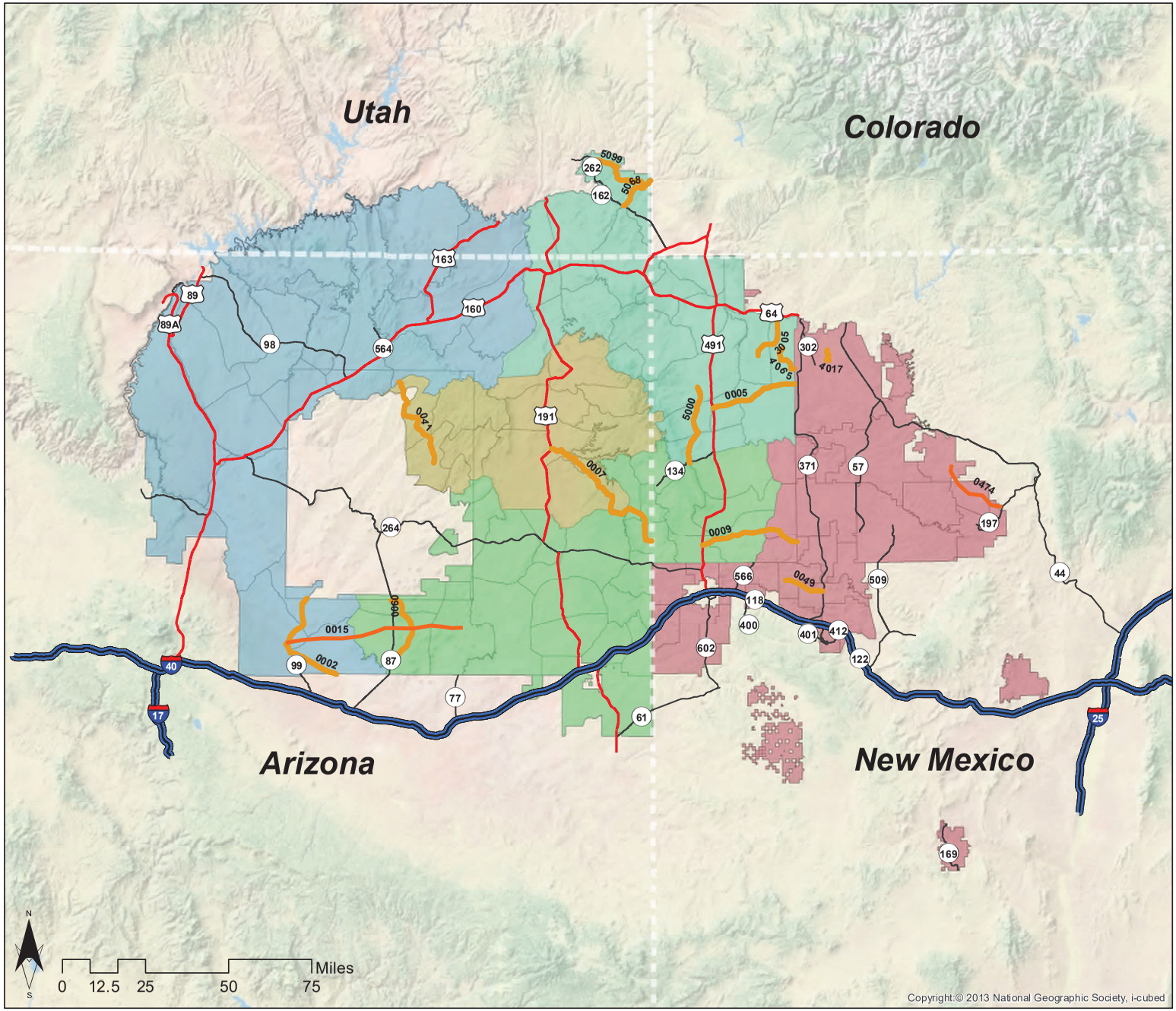
Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
TRIBAL RTE 1132	4	50	323	Road not located on the BIA DMR list
TRIBAL RTE 1134	4	40	220	Road not located on the BIA DMR list
TRIBAL RTE 1135	4	40		Road not located on the BIA DMR list
TRIBAL RTE 1136	4	40	863	Road not located on the BIA DMR list
TRIBAL RTE 1140	4	41	446	Road not located on the BIA DMR list
TRIBAL RTE 1203	4	88	1593	PCI Value too High (80-100)
TRIBAL RTE 1204	4	88	1195	PCI Value too High (80-100)
TRIBAL RTE 1246	4	38	103	Road not located on the BIA DMR list
TRIBAL RTE 1247	4	40	433	Road not located on the BIA DMR list
TRIBAL RTE 1248	4	40	379	Road not located on the BIA DMR list
TRIBAL RTE 1260	4	35		Road not located on the BIA DMR list
TRIBAL RTE 1264	4	40	337	Road not located on the BIA DMR list
TRIBAL RTE 1265	4	40	281	Road not located on the BIA DMR list
TRIBAL RTE 1266	4	40	9999	Road not located on the BIA DMR list
TRIBAL RTE 1315	5	45	2219	Road not located on the BIA DMR list
TRIBAL RTE 1316	4	43		Road not located on the BIA DMR list
TRIBAL RTE 1331	4	40	543	Road not located on the BIA DMR list
TRIBAL RTE 1340	4	41		Road not located on the BIA DMR list
TRIBAL RTE 1350	4	40	500	Road not located on the BIA DMR list
TRIBAL RTE 1351	4	40	491	Road not located on the BIA DMR list
TRIBAL RTE 1353	4	40	182	Road not located on the BIA DMR list
TRIBAL RTE 1355	4	43		Road not located on the BIA DMR list
TRIBAL RTE 1360	4	50	3646	Road not located on the BIA DMR list
TRIBAL RTE 1365	4	40	182	Road not located on the BIA DMR list
TRIBAL RTE 1368	4	43	2768	Road not located on the BIA DMR list
TRIBAL RTE 1373	5	45	2412	Road not located on the BIA DMR list
TRIBAL RTE 1374	4	50	192	Road not located on the BIA DMR list
TRIBAL RTE 1375	4	44	215	Road not located on the BIA DMR list
TRIBAL RTE 1377	5	62		Road not located on the BIA DMR list
TRIBAL RTE 1380	4	43		Road not located on the BIA DMR list
TRIBAL RTE 1381	4	40	185	Road not located on the BIA DMR list
TRIBAL RTE 1389	4	40		Road not located on the BIA DMR list
TRIBAL RTE 1390	5	40	2998	Road not located on the BIA DMR list
TRIBAL RTE 1391	5	31	886	Road not located on the BIA DMR list
TRIBAL RTE 1392	4	30		Road not located on the BIA DMR list
TRIBAL RTE 1395	4	30		Road not located on the BIA DMR list
TRIBAL RTE 1396	4	30		Road not located on the BIA DMR list
TRIBAL RTE 1400	4	44	192	Road not located on the BIA DMR list
TRIBAL RTE 1401	4	44	2568	Road not located on the BIA DMR list
TRIBAL RTE 1410	4	44	962	Road not located on the BIA DMR list
TRIBAL RTE 1430	4	30		Road not located on the BIA DMR list
TRIBAL RTE 1450	4	41	285	Road not located on the BIA DMR list
TRIBAL RTE 1454	4	31	7477	Road not located on the BIA DMR list
TRIBAL RTE 1462	4	88	1195	PCI Value too High (80-100)
TRIBAL RTE 1523	4	44	365	Road not located on the BIA DMR list
TRIBAL RTE 4845	4	41	4142	Road not located on the BIA DMR list
TRIBAL RTE 4931	5	40	1675	Road not located on the BIA DMR list
TRIBAL RTE 5104	4	95	1331	PCI Value too High (80-100)
TRIBAL RTE 6010	4	40	1530	Road not located on the BIA DMR list
TRIBAL RTE 6136	5	40	1675	Road not located on the BIA DMR list

Table 7 - RIFDs 4,5 roads

Road Name	Surface Type	PCI #	ADT Count	Reasons for Eliminating Road
TRIBAL RTE 6428	4	41	281	Road not located on the BIA DMR list
TRIBAL RTE 6430	4	40	9999	Road not located on the BIA DMR list
TRIBAL RTE 6456	4	40	595	Road not located on the BIA DMR list
TRIBAL RTE 6628	4	40	567	Road not located on the BIA DMR list
TRIBAL RTE 662A	4	40		Road not located on the BIA DMR list
TRIBAL RTE 662B	4	40		Road not located on the BIA DMR list
TRIBAL RTE 662C	4	40		Road not located on the BIA DMR list
TRIBAL RTE 6914	4	50		Road not located on the BIA DMR list
TRIBAL RTE 7070	5	90	178	PCI Value too High (80-100)
TRIBAL RTE 7250	4	53	2957	Road not located on the BIA DMR list
TRIBAL RTE 7321-CROWN	4	40	987	Road not located on the BIA DMR list
TRIBAL RTE 7383	4	40		Road not located on the BIA DMR list
TRIBAL RTE 7385	4	30		Road not located on the BIA DMR list
TRIBAL RTE 7386	4	30		Road not located on the BIA DMR list
TRIBAL RTE 7387	4	30		Road not located on the BIA DMR list
TRIBAL RTE 7388	4	30		Road not located on the BIA DMR list
TRIBAL RTE 7389	4	30		Road not located on the BIA DMR list
TRIBAL RTE 7391	4	30		Road not located on the BIA DMR list
TRIBAL RTE 7414	4	40	9999	Road not located on the BIA DMR list
TRIBAL RTE 7416	4	40	9999	Road not located on the BIA DMR list
TRIBAL RTE 7443	4	40	9438	Road not located on the BIA DMR list
TRIBAL RTE 7450	4	40		Road not located on the BIA DMR list
TRIBAL RTE 9888	4	60	1000	Road not located on the BIA DMR list
TWIN ARROWS ACCESS T(	5	0		PCI Value too Low (0-29)
URANIUM BLVD	4	30	323	Road not located on the BIA DMR list
	4			PCI Value too Low (0-29)

APPENDIX A

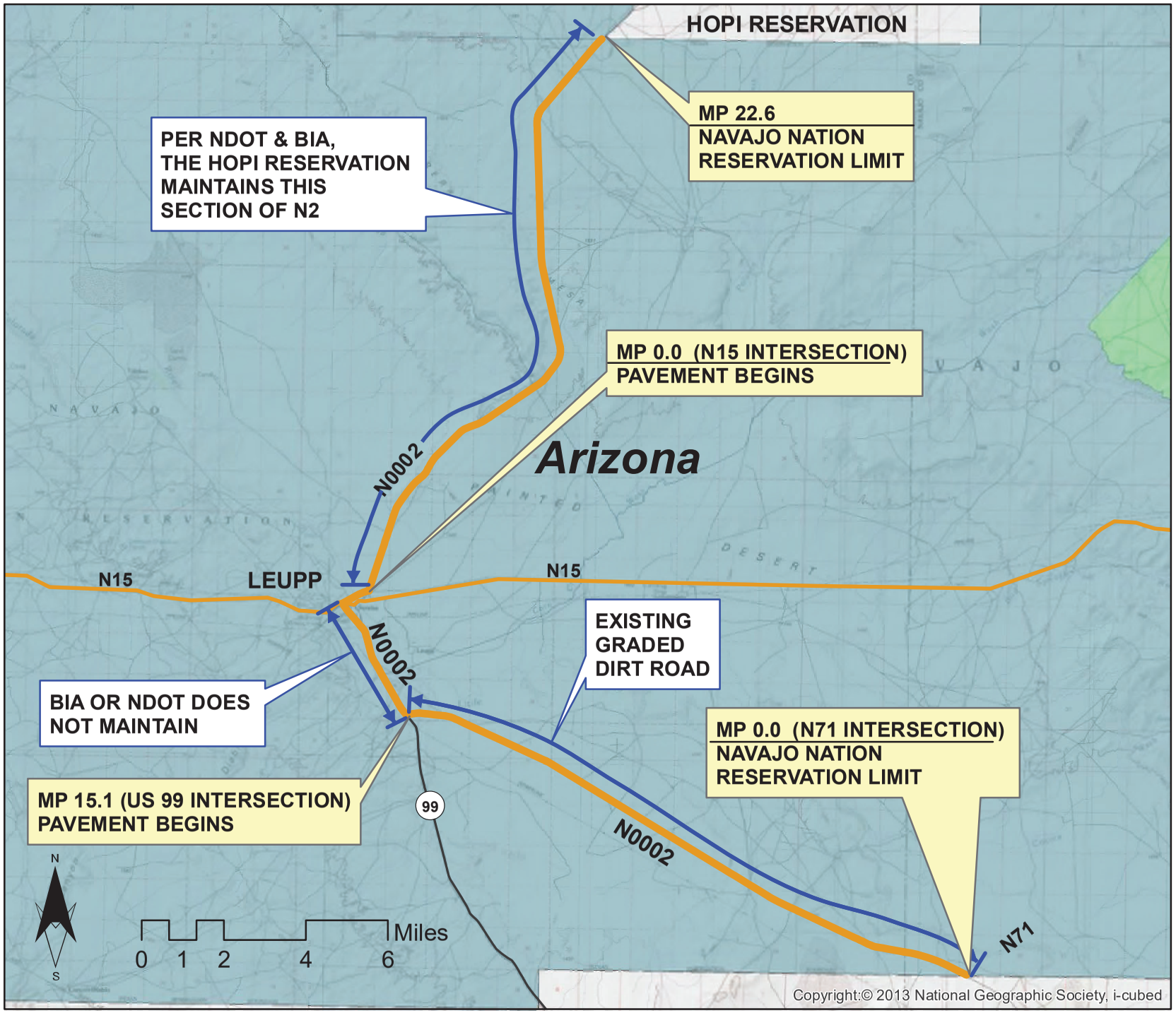


Navajo Nation

Route Identification

- Chinle Agency
- Eastern Agency
- Fort Defiance Agency
- Shiprock Agency
- Western Ageency
- Chapter Boundary
- Interstate
- US Highway
- State Highway
- BIA Route

BIA Route 0002



Route Identification

- Fort Defiance
- Western
- Interstate
- US Highway
- State Highway
- BIA Route

N2 Field Review, Suggested Mitigations and Photos

Field Review

- The roadway appears to be in good condition.
- North, two, 12’ driving lanes and 2’8” shoulders (MP 0 – MP 22.6).
- The project corridor has several distinct pavement conditions with a large stretch of unpaved roadway on the south end. The paved portions of N2 fall on the middle and north sections.
    - South end from N71/reservation boundary (MP 0) north to the AZ 99 intersection is approximately 15.1 miles of dirt graded roadway.
    - Middle segment = N2 combines with AZ 99 and N15 for approximately 4 miles of paved roadway. It is assumed that NDOT does not have maintenance responsibility for the AZ 99 section and ADOT does. The 0.75 length on N15 is handled in a separate field review.
    - North end from the N15 intersection near Leupp (MP 0) north to the Hopi Reservation boundary (MP 22.6).
        - This appears to be the portion of roadway within the BIA DMR, but the lengths do not match. The BIA records may include portion of N2 within the Hopi Reservation.
- The bottom lift of asphalt appears to be 2.5” thick. The top overlay lift of asphalt appears to be 1” thick. Not sure if there are additional lifts below these.
- RIFDS indicates an age of 28 to 59, this appears to be correct.
- The BIA DMR shows two listings for N5. This should be fixed by the BIA.
    - Type 5 Bitumenous > 2” = 9.3 miles long
    - Type 4 Bitumenous < 2” = 20.6 miles long
    - Suggest using Type 5 Bitumenous > 2” = 22.6 miles long
- RIFDS indicates a PCI of 38 to 70.
    - The conditions observed do not indicate a PCI condition of 38. See following photos.
    - Suggest modifying roadway PCI value to 70 as the majority of the pavement is still in GOOD condition. The distress areas noted below can be considered FAIR condition with a PCI of 50.
- The pavement evaluation indicated the following characteristics:
    - North, MP 0 – 22.6 = signs of minor longitudinal/block cracking, 40’-50’ spaced transverse cracking with fairly decent striping, pavement is slightly fading in color. Some weeds are growing into the cracks on the shoulders. Some previous crack sealing completed on some of the cracks.
        - Some bad areas/distresses (approximately 8 locations) were noted along the corridor at MP 6.2, 6.6, 11.5-11.6, 12.2, 15.9, 18, 19.3.
    - North, MP 13.2 – 13.9 and MP 14.9 – 15.2 = a newer overlay was completed for these two short stretches of roadway. Most likely a previous maintenance effort.
    - The N2 roadway section includes reflective pavement markers (milled or glued) on the center and shoulder stripes. Replacing these markers should be accounted for in any maintenance operations.

Suggested Mitigations

- No mitigations are recommended at this time. NDOT has indicated that there is a maintenance agreement with the Hopi Reservation for this portion of road.

Photos

- Field review photos taken on August 3, 2018.






BIA Route 0005

Route Identification

- Eastern
- Fort Defiance
- Shiprock
- Interstate
- US Highway
- State Highway
- BIA Route

N5 Field Review, Suggested Mitigations and Photos

Field Review

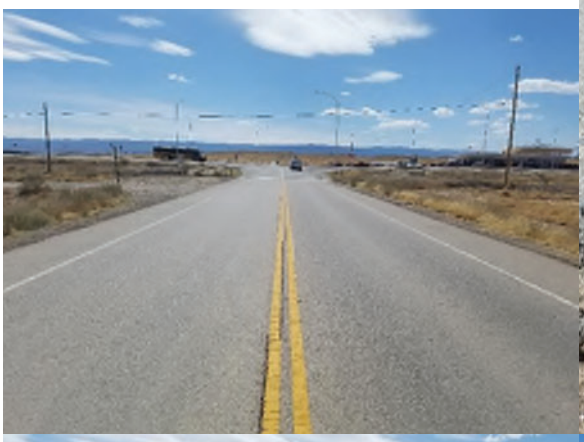
- The roadway starts at the US 491 intersection (MP 0) and is in good condition. Two, 12' driving lanes and 5' shoulders (MP 0 – MP 11). The shoulder width reduces to 2' at MP 11.
- The top lift of asphalt appears to be 2" to 2.5" thick. Not sure if there are additional lifts below this.
- RIFDS indicates an age of 38 to 46, this appears to be incorrect.
- The BIA DMR shows two listings for N5. This should be fixed by the BIA.
    - Type 5 Bitumenous > 2" = 15.0 miles long
    - Type 4 Bitumenous < 2" = 11.6 miles long
    - Suggest using Type 5 Bitumenous > 2" = 27.4 miles long
- RIFDS indicates a PCI of 30.
    - The conditions observed do not indicate a PCI condition of 30. See following photos.
    - Suggest modifying roadway PCI value to 70 - 80 as the majority of the pavement is still in GOOD to VERY GOOD condition. The distress areas noted below can be considered FAIR condition with a PCI in the mid 40s.
- The pavement evaluation indicated the following characteristics:
    - MP 0 – 11 = signs of minor longitudinal cracking with fairly decent striping, pavement is slightly fading in color.
        - Some bad areas/distresses (approximately 4 locations) were noted along the corridor at MP 1.5, 4, 13 (2 total).
    - MP 11 – MP 19 = roadway subgrade issues exist, multiple distress locations and BIA cutouts.
        - MP 16.5 = BIA cutout section (approximately 75 feet long) is extremely bumpy and is a safety hazard.
        - Some bad areas/distresses (approximately 3 locations) were noted along the corridor at MP 15.5, 16.9 & 17.5.
    - MP 19 – 27.4 = signs of minor longitudinal cracking with fairly decent striping, pavement is slightly fading in color.
        - One bad area/distress was noted along the corridor at MP 22.5.

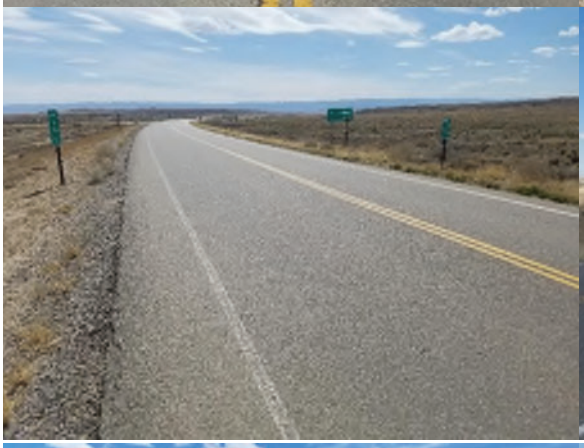
Suggested Mitigations

- MP 0 – 12.5 and MP 19 – MP 27.4 = Fog seal and new striping.
- MP 12.5 – 19 = Full depth pavement recycling at the distress areas (assume length 30% of total = 2 miles).

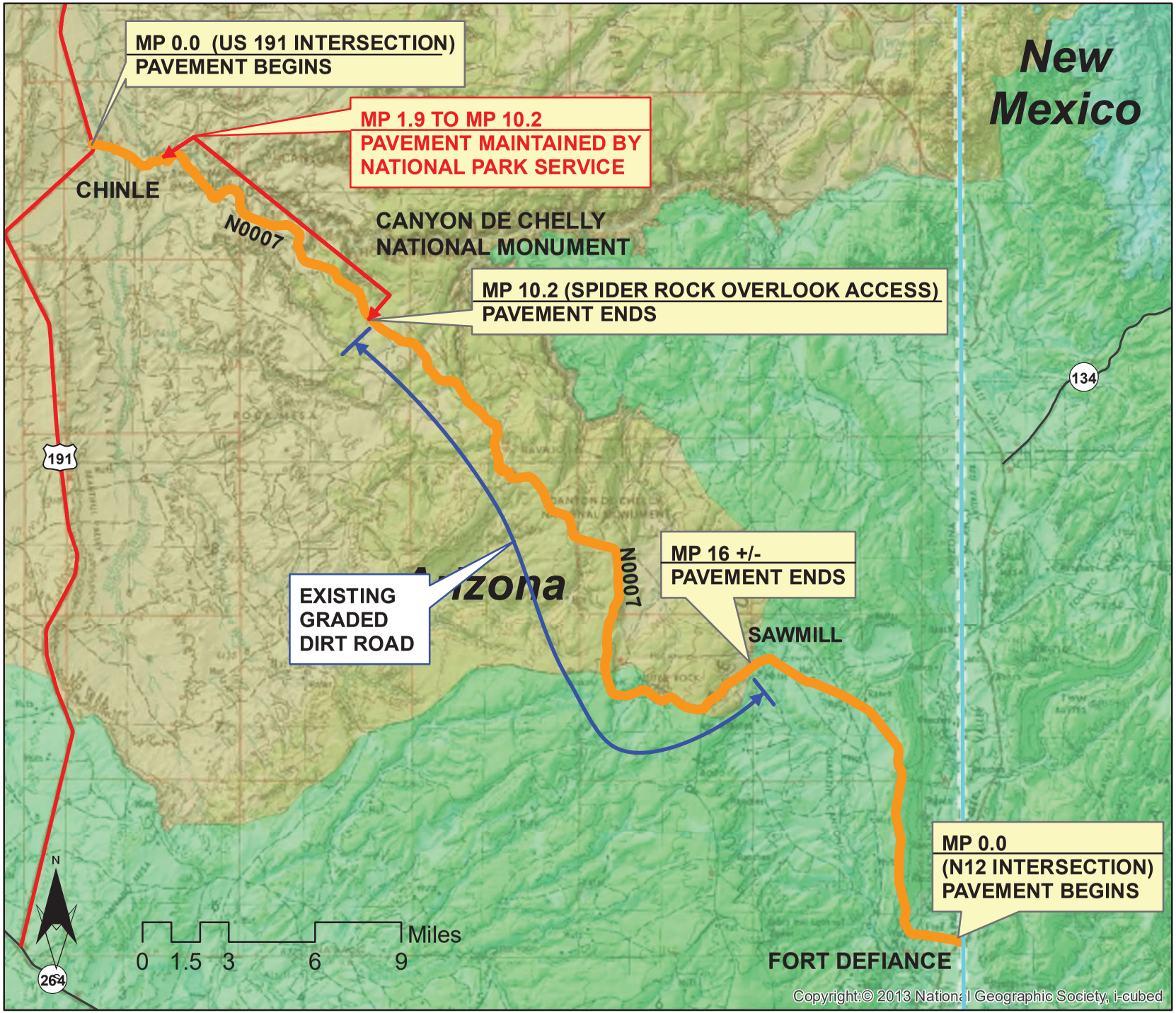
Photos

- Field review photos taken on April 24, 2018.





BIA Route 0007



Route Identification

- Chinle
- Fort Defiance
- Shiprock
- Interstate
- US Highway
- State Highway
- BIA ROUTE

N0007 Field Review, Suggested Mitigations and Photos

Field Review

- The roadway appears to be in poor to very good condition depending on the location.
- The project corridor has several distinct pavement conditions with a large stretch of unpaved roadway in between. The paved portions of N7 fall on the south and north sections and have separate mileposts for each which makes it very difficult to keep records/data on.
    - South end from N12 (MP 0) to Sawmill, AZ (MP 16).
        - This appears to be the portion of roadway within the BIA DMR.
        - Due to time/daylight limitations, this portion of the road was not field reviewed.
    - Middle segment = approximately 25 miles of dirt graded roadway.
    - North end from US 191 (MP 0) to south end of Canyon de Chelly Monument (MP 10.2).
        - It should be noted that from MP 2.4 to MP 10.2, the roadway is in VERY GOOD condition and appears to be chip seal overlaid by the National Park Service.
- South - two, 12’ driving lanes and 4’ shoulders (based on Google Earth measurement and RIFDS data).
- North (MP 0 – 0.35) - four, 12’ driving lanes, one, 12’ center turn lane, 2’-6’ shoulders with offset sidewalks on both sides.
- North (MP 0.35 – 2.4) - four, 12’ driving lanes, no shoulders with curb and gutter and sidewalks on both sides.
- A lift thickness was not measured.
- RIFDS indicates an age of 7-39, this appears to be correct for the majority of the road. It is assumed the 7 year pavement is within the National Park.
- The BIA DMR project length is showing 15.9 miles, which would match it to the south end section.
- RIFDS indicates a PCI of 30-70.
    - The conditions observed are as follows. See following photos.
        - South end, MP 0 - 15, PCI of 50 (based on Google Earth imagery)
        - South end, MP 15 – 16, PCI of 30
        - North end, MP 0 – 2.4, PCI of 50
        - North end, MP 2.4 – 10.2, PCI of 80
- The pavement evaluation indicated the following characteristics:
    - North and South, faded asphalt color.
    - Prior maintenance efforts include crack sealing and chip seal (north end, MP 2.4 – 10.2).
    - Minor potholes, block, transverse and longitudinal cracking.
    - South end, MP 15 – 16, severe deterioration of pavement and past overlays.
    - One bad areas/distress was noted along the corridor at MP 2.

Suggested Mitigations

- South end, MP 0 – 15
    - Crack seal, seal coat and striping.
- South end, MP 15 – 16
    - Patching, mill, major structure overlay and striping.

- North end, MP 0 – 2.4
    - Patching and removal and replace the pavement distress areas.
    - Mill and minor inlay.
    - Striping.

Photos

- Field review photos taken on July 17, 2018.

BIA Route 0009

Route Identification

- Eastern
- Fort Defiance
- Interstate
- US Highway
- State Highway
- BIA Route

N0009 Field Review, Suggested Mitigations and Photos

Field Review

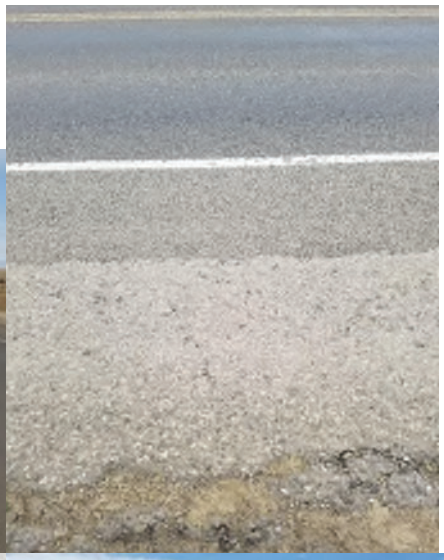
- The roadway is in extremely good condition. Two, 12' driving lanes and 4' to 5' shoulders.
- The top lift of asphalt appears to be 2" thick. Not sure if there are additional lifts below this, but BIA project history would indicate the section is thicker than this.
- RIFDS indicates an age of 7 to 59, the upper value appears to be incorrect. More like 7 to 15.
- The BIA DMR shows two listings for N9. This should be fixed by the BIA.
    - Type 5 Bitumenous > 2" = 29.5 miles long
    - Type 4 Bitumenous < 2" = 37.9 miles long
    - Suggest using Type 5 Bitumenous > 2" = 39.6 miles long
- The project corridor has three distinct pavement conditions based on the BIA projects that were completed. The end projects were completed first and then the middle.
    - MP 0 – 20 = 2nd oldest pavement
    - MP 20 - 30 = newest pavement
        - MP 30 falls approximately at the N52 Dalton Pass road intersection
    - MP 30 – 39 = oldest pavement
- RIFDS indicates a PCI of 30 - 70.
    - The conditions observed do not indicate a PCI condition of 30. See following photos.
    - Suggest modifying roadway PCI value to 60 - 80 as the majority of the pavement is still in GOOD to VERY GOOD condition. The distress areas noted below can be considered FAIR condition with a PCI in the mid 40s.
- The pavement evaluation indicated the following characteristics:
    - MP 0 - 20 = minor potholing, signs of longitudinal cracking, the OGFC layer is raveling pretty bad in areas (specifically around the centerline stripe)
        - Some bad areas/distresses (approximately 7 locations) were noted along the corridor at MP 0.5, 6, 5.5, 7 (2 total), 13.5, 14.5.
    - MP 20 - 30 = pavement is fading in color
    - MP 30 - 39 = this section of road has already had pavement maintenance consisting of crack sealing and a microsurface type overlay
        - Some bad areas/distresses (approximately 5 locations) were noted along the corridor at MP 31, 32.3, 33, 35.5, 37.

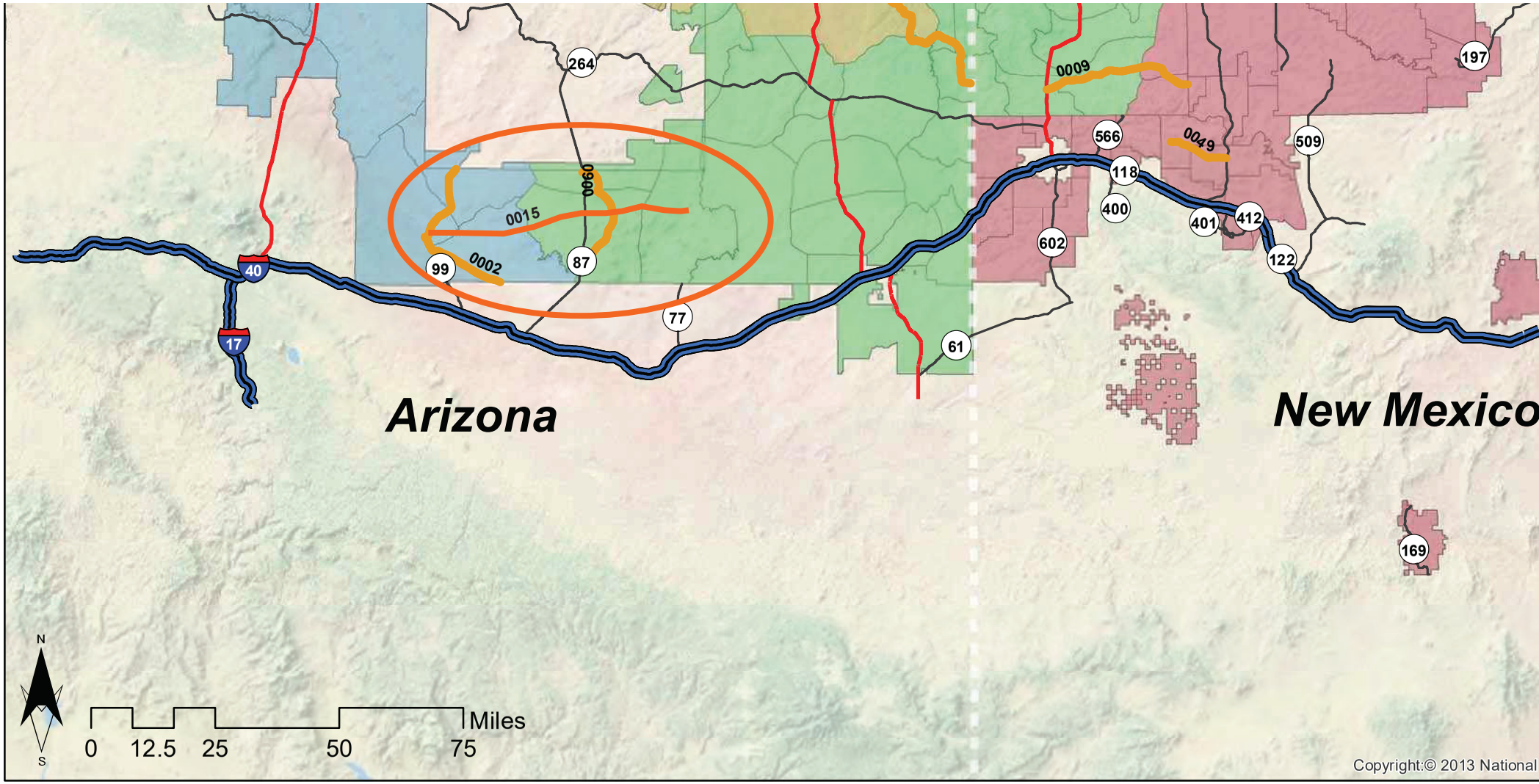
Suggested Mitigations

- MP 0 - 20 = Spot patching and removal and replace the pavement distress areas. Remove and replace the OGFC layer.
    - Assume 100 feet of pavement removal for each distress area.
- MP 20 - 30 = Fog seal only.
- MP 30 – 39 = Spot patching and removal and replace the pavement distress areas. Place a minor 2" thick structural overlay and new OGFC. Overlay will require milling at edges within the 1.25 mile long curb and gutter section in Crownpoint.
- Restripe.

Photos

- Field review photos taken on April 5, 2018.

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N15 Field Review, Suggested Mitigations and Photos

Field Review

- **This road was not part of the pavement review list, but was a request from Darryl Bradley to complete a review from AZ 99 to Indian Wells. The roadway was eliminated as there was already a 2018-2022 TTIP project shown for the road (which was further east of this section).**
- The pavement review started on the west end (MP 15.5) where the N2 intersection is located and proceeded east to just past Indian Wells for 54 miles (MP 69.5) until N15 intersects with AZ 77/N6.
- The roadway appears to be in fair to good condition.
- A lift thickness was not measured.
- RIFDS indicates an age range of 7 to 59, the lower value of 7 appears to be correct for the majority of the road from AZ99 to AZ87, then the age appears to be closer to 28 from AZ87 to N6.
- The BIA DMR project length is showing 67.4 miles, the section reviewed for this report was only 54 miles.
- RIFDS indicates a PCI of 30 to 70.
    - The conditions observed indicate a PCI condition of 70 is appropriate for MP 15.5 – 36.1. The PCI value for MP 36.1 – 69.5 is closer to 60. See following photos.
- The project corridor has two distinct pavement evaluation conditions.
    - MP 15.5 – 36.1 = pavement in good condition with minor cracking.
        - Two, 12’ driving lanes and 4’ shoulders.
        - Minor transverse and longitudinal cracking.
        - Some bad areas/distresses (approximately 3 locations) were noted along the corridor at MP 22.1-22.3.
        - Prior maintenance efforts include crack sealing.
    - MP 36.1 – 69.5 = pavement is older and in fair condition with a chip seal overlay. Weeds are forming in the cracks and on the shoulders.
        - Two, 12’ driving lanes and 3.5’ shoulders. Faded asphalt color.
        - Potholes, block, transverse and longitudinal cracking.
        - Some bad areas/distresses (approximately 10 locations) were noted along the corridor at MP 38.4, 39.3, 39.7, 40.3, 41.6, 53.6, 55.2, 56.2, 66.3, 68.8.
        - Prior maintenance efforts include crack sealing, pothole repair and chip seal overlay.

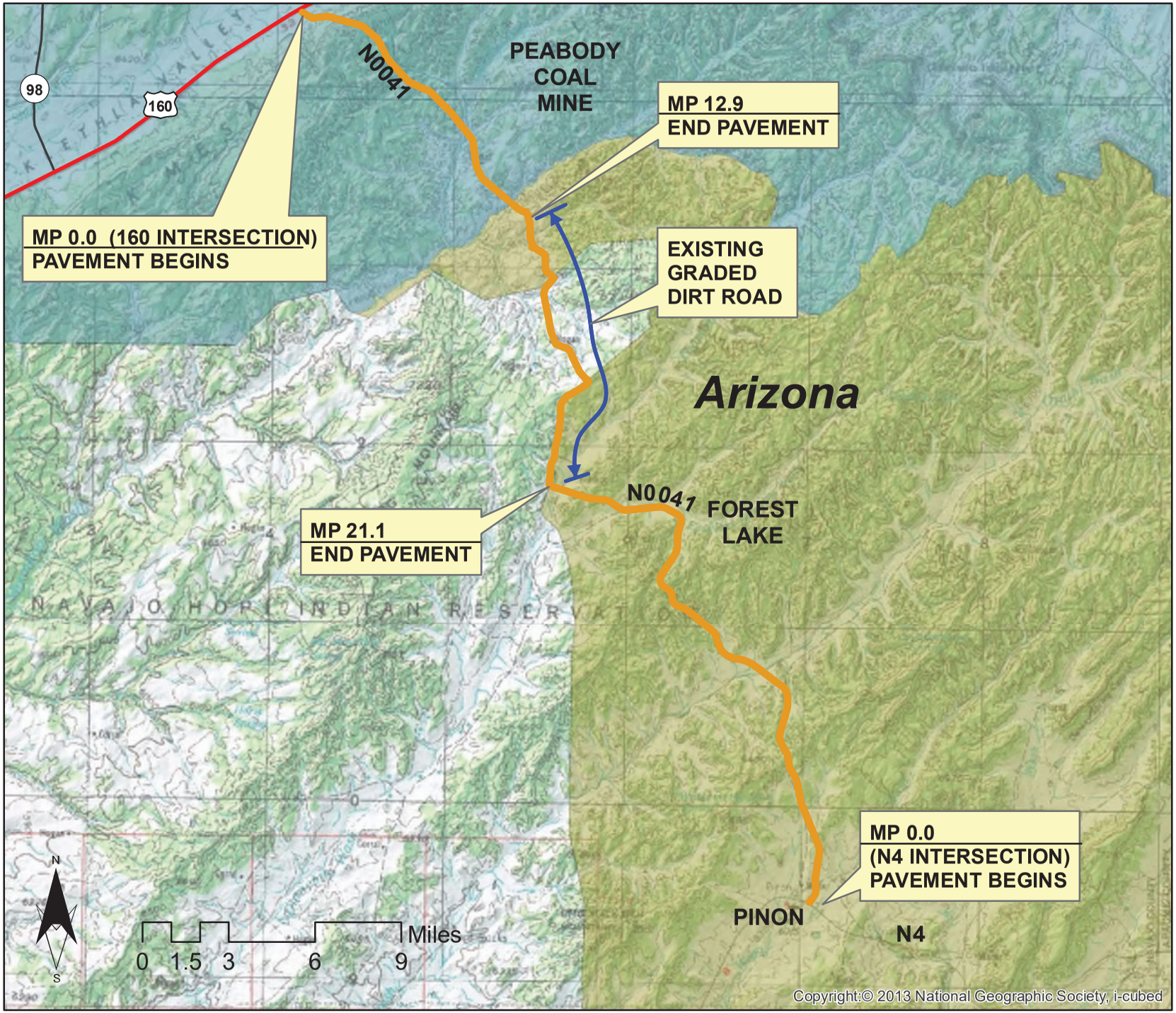
Suggested Mitigations

- Crack sealing, patching and spraying weed killer on the shoulders.

Photos

- Field review photos taken on August 3, 2018.

BIA Route 0041



Route Identification

- Chinle
- Western
- Interstate
- US Highway
- State Highway
- BIA Route

N41 Field Review, Suggested Mitigations and Photos

Field Review

- The roadway appears to be in fair to good condition.
- The project corridor has several distinct pavement conditions with a large stretch of unpaved roadway in between. The paved portions of N41 fall on the south and north sections and have separate mileposts for each which makes it very difficult to keep records/data on.
    - North end from US 160 (MP 0) south to past the Peabody Coal/Black Mesa Mine access points (MP 12.9).
    - Middle segment = approximately 11.2 miles of dirt graded roadway.
    - South end from N4 near Pinon (MP 0) north to past Forest Lake (MP 21).
        - This appears to be the portion of roadway within the BIA DMR.
- North - two, 12' driving lanes and 2' shoulders.
- South - two, 12' driving lanes and 1' shoulders.
- The top lift of asphalt appears to be 3" thick. Not sure if there are additional lifts below this.
- RIFDS indicates an age of 21-59, this appears to be correct for the majority of the road.
- The BIA DMR project length is showing 21.3 miles, whereas the actual overall length of both segments is 33.9 miles.
- The project corridor has two distinct pavement conditions.
    - North, MP 0 – 12.9 = pavement in fair condition with at least three repair areas. Some sections of the roadway have had a seal coat. There is a large amount of truck traffic on this portion gaining access to the mines.
    - South, MP 0 – 21 = pavement in fair condition with several sections that had overlays.
- RIFDS indicates a PCI of 53-68.
    - The conditions observed indicate a lower PCI condition of 40-50. See following photos.
    - Suggest modifying roadway PCI value to 40-50. Some of the distress areas can be considered VERY POOR condition with a PCI in the 20s.
- The pavement evaluation indicated the following characteristics:
    - Faded asphalt color. Striping is poor to nonexistent in some areas.
    - Prior maintenance efforts include crack sealing, pothole repair, seal coat, minor overlays and major reconstruction repair areas. The intersection with US 160 appears to have had multiple overlays.
    - Significant number of potholes, block, transverse, longitudinal and alligator cracking.
    - North – a large number of bad areas/distresses (approximately 35 locations) were noted along the corridor at MP 0.8-1.0, 2.1, 2.5, 3.4-3.5, 3.6, 4.0-4.4, 4.7-4.8, 5.0-5.1, 5.8-5.9, 6.7, 6.9, 7.1-7.2, 7.5, 9.4-9.6, 9.8-10.1, 11.4, 11.7, 12.0, 12.1, 12.5.
    - South – a large number of bad areas/distresses (approximately 19 locations) were noted along the corridor at MP 0.8-0.9, 1.2, 1.4, 2.0, 2.4, 4.2, 5.3, 5.9-6.0, 11.2, 11.5, 14.4, 15.1, 15.3, 15.5-15.6, 19.9-20.0.
    - South – MP 20.6-20.7 has sediment on the road indicting a drainage issue at the bridge crossing that should be looked into.
    - South – MP 8.8, Arrow Indian Contractors was completing a crack seal operation in this area on the day of the field review.

Suggested Mitigations

- North, MP 0 – 12.9
    - Patching, mill and major structure overlay.
- South, MP 0 – 21
    - Patching and removal and replace the pavement distress areas.
    - Minor overlay.
- Restripe.

Photos

- Field review photos taken on August 2, 2018.

BIA Route 0049

Route Identification

- Eastern
- Interstate
- US Highway
- State Highway
- BIA Route

N0049 Field Review, Suggested Mitigations and Photos

Field Review

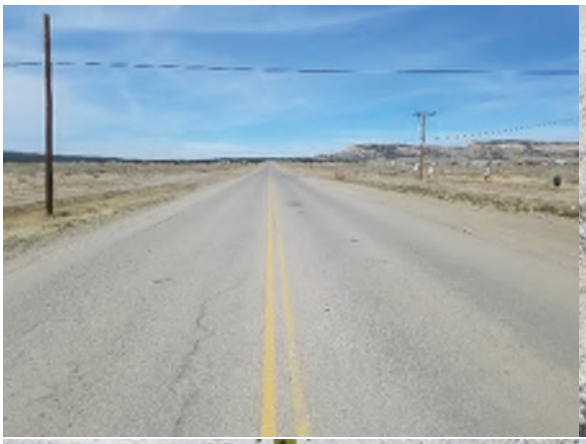
- The roadway appears to be in fair to good condition. Two, 12’ driving lanes and 2’ shoulders.
- The top lift of asphalt appears to be 2” thick. Not sure if there are additional lifts below this.
- RIFDS indicates an age of 59, this appears to be incorrect.
- The BIA DMR project length is showing 12 miles (actual length is closer to 12.5 miles).
- RIFDS indicates a PCI of 30.
    - The conditions observed do not indicate a PCI condition of 30. See following photos.
    - Suggest modifying roadway PCI value to 50-60 as the majority of the pavement is still in FAIR to GOOD condition. The distress areas noted below can be considered POOR condition with a PCI in the upper 30s.
- The pavement evaluation indicated the following characteristics:
    - Faded asphalt color
    - Minor potholes and spotty longitudinal cracking
    - Some bad areas/distresses (approximately 12 locations) were noted along the corridor at MP 12.5, 13, 13.5, 13.7 (2 total), 15, 15.5, 16.5, 17, 20, 21 (2 total).

Suggested Mitigations

- Spot patching and removal and replace the pavement distress areas.
    - Assume 100 feet of pavement removal for each distress area.
- Crack seal and fog seal the entire project length.
- Restripe.

Photos

- Field review photos taken on April 5, 2018.






BIA ROUTE 0060

Route Identification

- Fort Defiance
- Western
- Interstate
- US Highway
- State Highway
- BIA Route

N0060 Field Review, Suggested Mitigations and Photos

Field Review

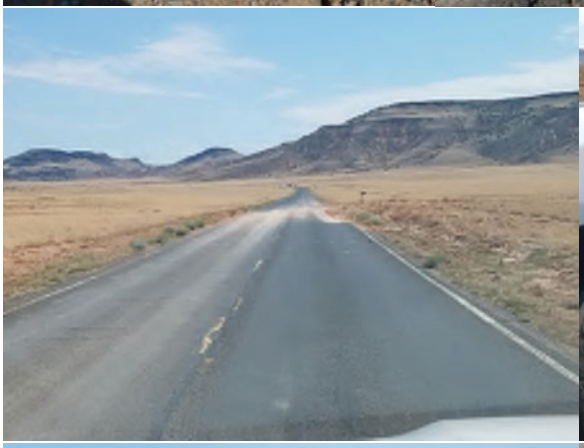
- The roadway appears to be in very poor to poor condition. Two, 11’ driving lanes and no shoulders.
- The asphalt appears to be 3” thick (2 – 1.5” lifts).
- RIFDS indicates an age of 15 to 26, this appears to be incorrect.
- The BIA DMR project length is showing 25.1 miles, which matches the field review length.
- RIFDS indicates a PCI of 50 - 60.
    - The conditions observed do not indicate a PCI condition of 50-60. See following photos.
    - Suggest modifying roadway PCI value to 25-35 as the majority of the pavement is in POOR condition.
- The pavement evaluation indicated the following characteristics:
    - Faded asphalt color. Bleeding in the wheel path areas.
    - Major potholes, heavy rutting, loss of pavement edge, longitudinal, transverse, block and alligator cracking.
    - MP 1.5 & 6.4 – ponding and sediment buildup on the road indicates a drainage issue that should be corrected.
    - Some bad areas/distresses (approximately 19 locations) were noted along the corridor at MP 0.8, 1.3, 3.8, 7.0, 7.7, 7.9, 9.7, 12.2, 13.4-13.5, 14.0, 14.2, 16.5, 17.9, 18.0, 19.3, 21.6-21.7, 22.
    - Prior maintenance efforts include crack sealing, pothole repair and fog seal.

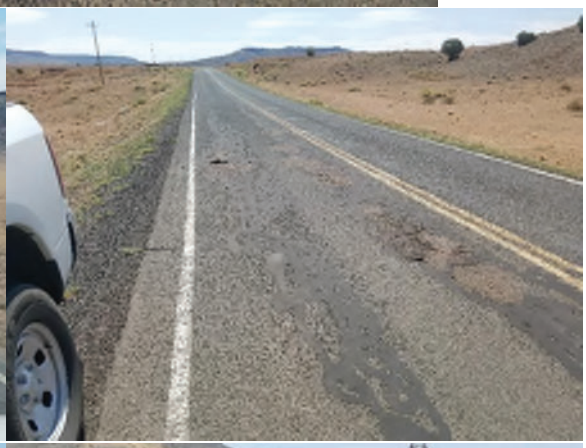
Suggested Mitigations

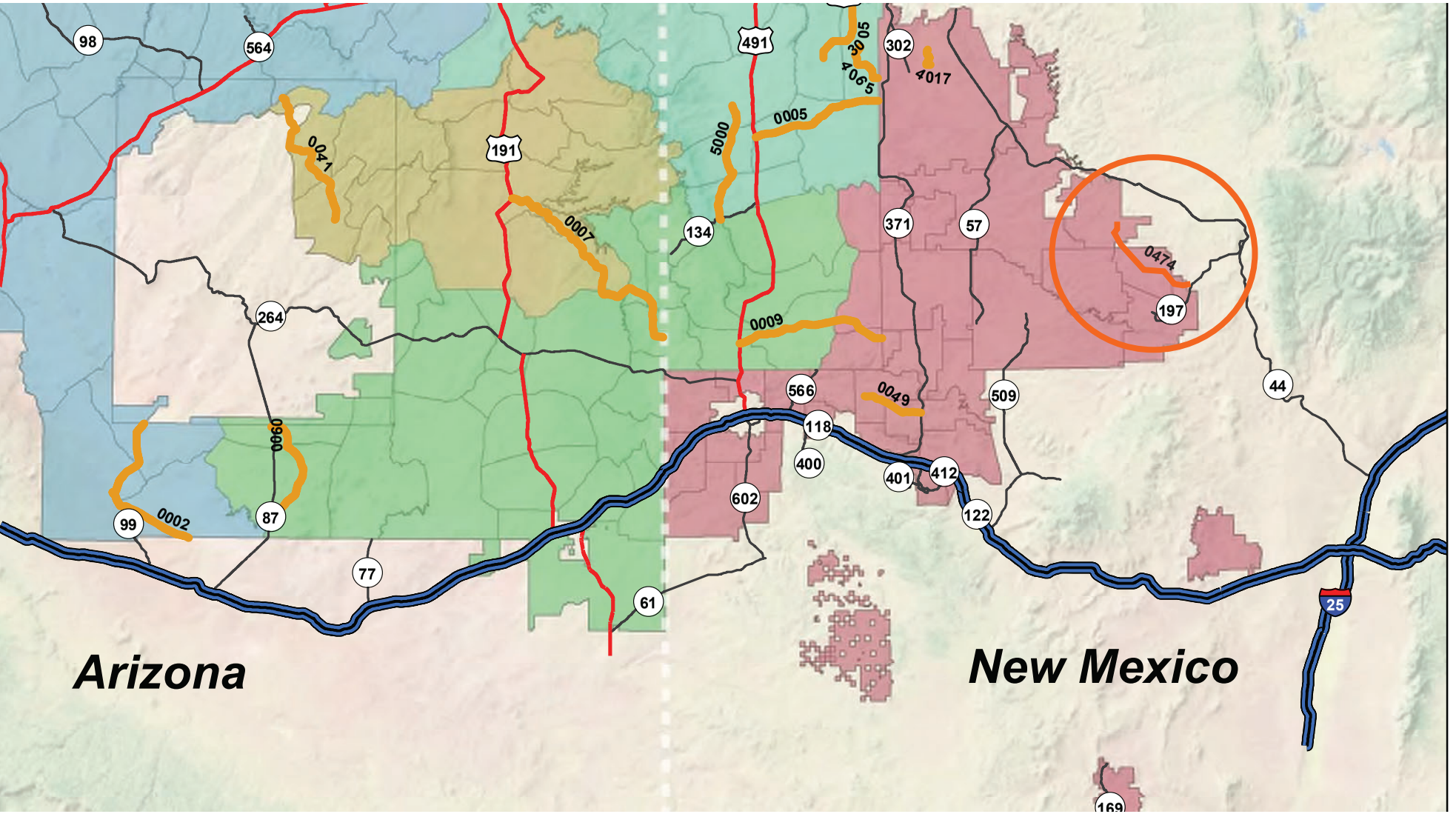
- Patching, repair of distress areas and major structure overlay.
- Restripe.

Photos

- Field review photos taken on August 3, 2018.



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N474 Field Review, Suggested Mitigations and Photos

Field Review

- **This road was not part of the pavement review list, but was a request from Darryl Bradley to complete. The roadway was eliminated as there was already a 2018-2022 TTIP project shown for the road. The section of road evaluated fell directly south of the TTIP project.**
- The pavement review started on the north end (MP 0) where the N474(4) project BOP is located and proceeded south past Ojo Encino for 23.1 miles until the N474 intersected with NM 197.
- The roadway appears to be in fair condition. Two, 11' driving lanes and 2' shoulders. At approximately MP 12.7, the shoulders and striping went away.
- A lift thickness was not measured. The pavement section appears to be chip seal.
- RIFDS indicates an age of 42, this appears to be correct for the majority of the road.
- The BIA DMR project length is showing 11.9 miles, whereas the actual length is 23.1 miles.
- The project corridor has three distinct pavement conditions.
    - MP 0 – 10.3 = pavement in fair condition with one repair area and several (up to six) roller coaster areas
    - MP 10.3 – 12.7 = pavement in fair condition with four previous BIA repair areas
    - MP 12.7 – 23.1 = pavement in very poor condition with extensive patching and no visible striping
- RIFDS indicates a PCI of 43.
    - The conditions observed indicate a PCI condition of 20-43. See following photos.
    - Suggest modifying roadway PCI value to 20-43 based on the sections noted above. Some of the distress areas in the south section can be considered VERY POOR condition with a PCI in the 20s.
- The pavement evaluation indicated the following characteristics:
    - Faded asphalt color.
    - Prior maintenance efforts include crack sealing, pothole repair and major reconstruction repair areas.
    - Significant number of potholes, block, transverse, longitudinal and alligator cracking.
    - The number of bad areas/distresses wasn't noted as the amount was too large.

Suggested Mitigations

- Patching and removal and replace the pavement distress areas.
    - Assume 100 feet of pavement removal for each distress area.
- Crack seal and minor structure overlay for MP 0 – 12.7.
- Major overlay of pavement from MP 12.7 – 23.1.
- Restripe.

Photos

- Field review photos taken on July 19, 2018.

BIA Route 3005

Route Identification

- Shiprock
- Interstate
- US Highway
- State Highway
- BIA Route

N3005 Field Review, Suggested Mitigations and Photos

Field Review

- The roadway appears to be in fair to poor condition. Two, 12' driving lanes and 1' shoulders.
- A lift thickness was not measured.
- RIFDS indicates an age of 28 - 59, this appears to be incorrect.
- The BIA DMR project length is showing 13.9 miles (actual length is closer to 14.1 miles).
- RIFDS indicates a PCI of 66.
    - The conditions observed do not indicate a PCI condition of 66. See following photos.
    - Suggest modifying roadway PCI value to 30-50 as the majority of the pavement is in POOR to FAIR condition. The distress areas noted below can be considered POOR condition with a PCI in the 30s.
- The pavement evaluation indicated the following characteristics:
    - Faded asphalt color.
    - Minor potholes, block, transverse, longitudinal and alligator cracking.
    - Some bad areas/distresses (approximately 8 locations) were noted along the corridor at MP 1.7-2.1, 3.9, 4.8, 6.7-6.8, 12, 12.2, 12.4, 13.6.

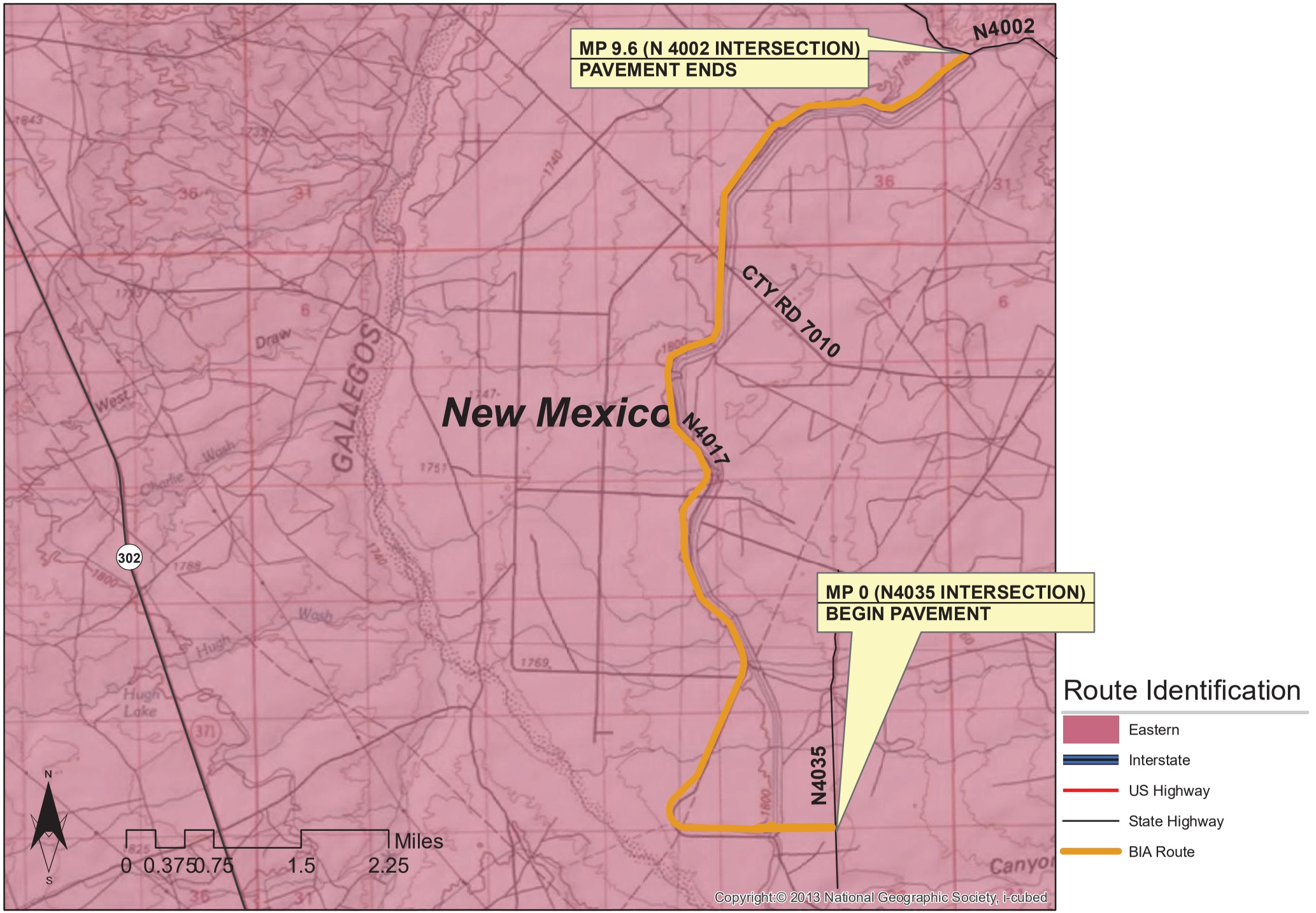
Suggested Mitigations

- Patching and removal and replace the pavement distress areas.
    - Assume 100 feet of pavement removal for each distress area.
- Crack seal and minor structure overlay the entire project length.
- Restripe.

Photos

- Field review photos taken on April 26, 2018.

BIA Route 4017



N4017 Field Review, Suggested Mitigations and Photos

Field Review

- The roadway appears to be in good condition. Two, 11' driving lanes and 2' shoulders.
- A lift thickness was not measured.
- RIFDS indicates an age of 26, this appears to be correct for the majority of the road.
- The BIA DMR project length is showing 9.7 miles (actual length is closer to 9.6 miles).
- The project corridor has two distinct pavement conditions. The split falls at the intersection of county road 7010.
    - MP 0 – 6.5 = oldest pavement in poor condition
    - MP 6.5 – 9.6 = newer pavement in good condition
- RIFDS indicates a PCI of 60.
    - The conditions observed do not indicate a PCI condition of 60. See following photos.
    - Suggest modifying roadway PCI value to 30 and 70 based on the sections noted above. Some of the distress areas in the south section can be considered VERY POOR condition with a PCI in the 20s.
- The pavement evaluation indicated the following characteristics:
    - Faded asphalt color.
    - Prior maintenance efforts include crack sealing and chip seal.
    - Minor potholes, block, transverse, longitudinal and alligator cracking.
    - Some bad areas/distresses (approximately 15 locations) were noted along the corridor at MP 0.1 (2 total), 0.4, 0.6, 0.7, 0.8, 0.9, 1.0, 3.2 (2 total), 3.25, 3.3, 3.4, 3.5, 3.9.

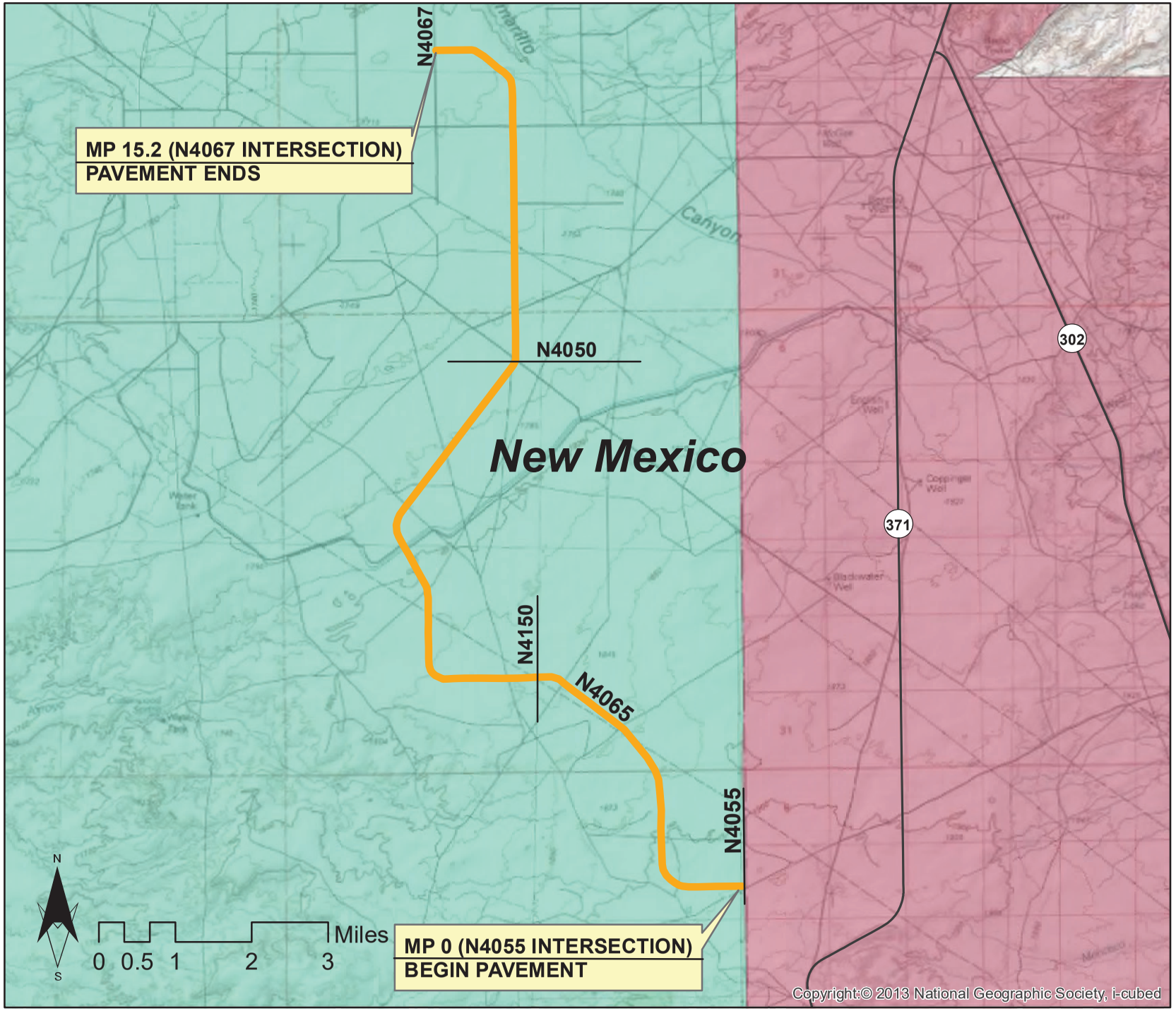
Suggested Mitigations

- Patching and removal and replace the pavement distress areas.
    - Assume 100 feet of pavement removal for each distress area.
- Crack seal and minor structure overlay for MP 0 - 6.5.
- Restripe.

Photos

- Field review photos taken on July 19, 2018.

BIA Route 4065



N4065 Field Review, Suggested Mitigations and Photos

Field Review

- The roadway appears to be in good condition. Two, 11'8" driving lanes and 4' shoulders. The typical section changes at MP 7.5 and the shoulders disappeared.
- A lift thickness was not measured.
- RIFDS indicates an age of 16 - 59, this appears to be incorrect.
- The BIA DMR project length is showing 15.3 miles (actual length is closer to 15.2 miles).
- RIFDS indicates a PCI of 44-70.
    - The conditions observed do not indicate a PCI condition of 44. See following photos.
    - Suggest modifying roadway PCI value to 60-70 as the majority of the pavement is in GOOD condition.
- The pavement evaluation indicated the following characteristics:
    - Faded asphalt color. Striping in bad condition.
    - Weeds were starting to encroach into the cracks on the shoulders.
    - The prairie dog population is creating potholes on the corridor by them burrowing underneath the pavement edges.
    - Minor potholes, transverse (25' – 90' spacing) and longitudinal cracking.
    - Previous crack sealing has been completed on the corridor, but not for all cracks.
    - The BIA was actually working on this road when the field review occurred. They were placing cold asphalt patching along the roadway.
    - Some bad areas/distresses (approximately 4 locations) were noted along the corridor at MP 1.8, 2.3-2.5, 3.2, 3.8.

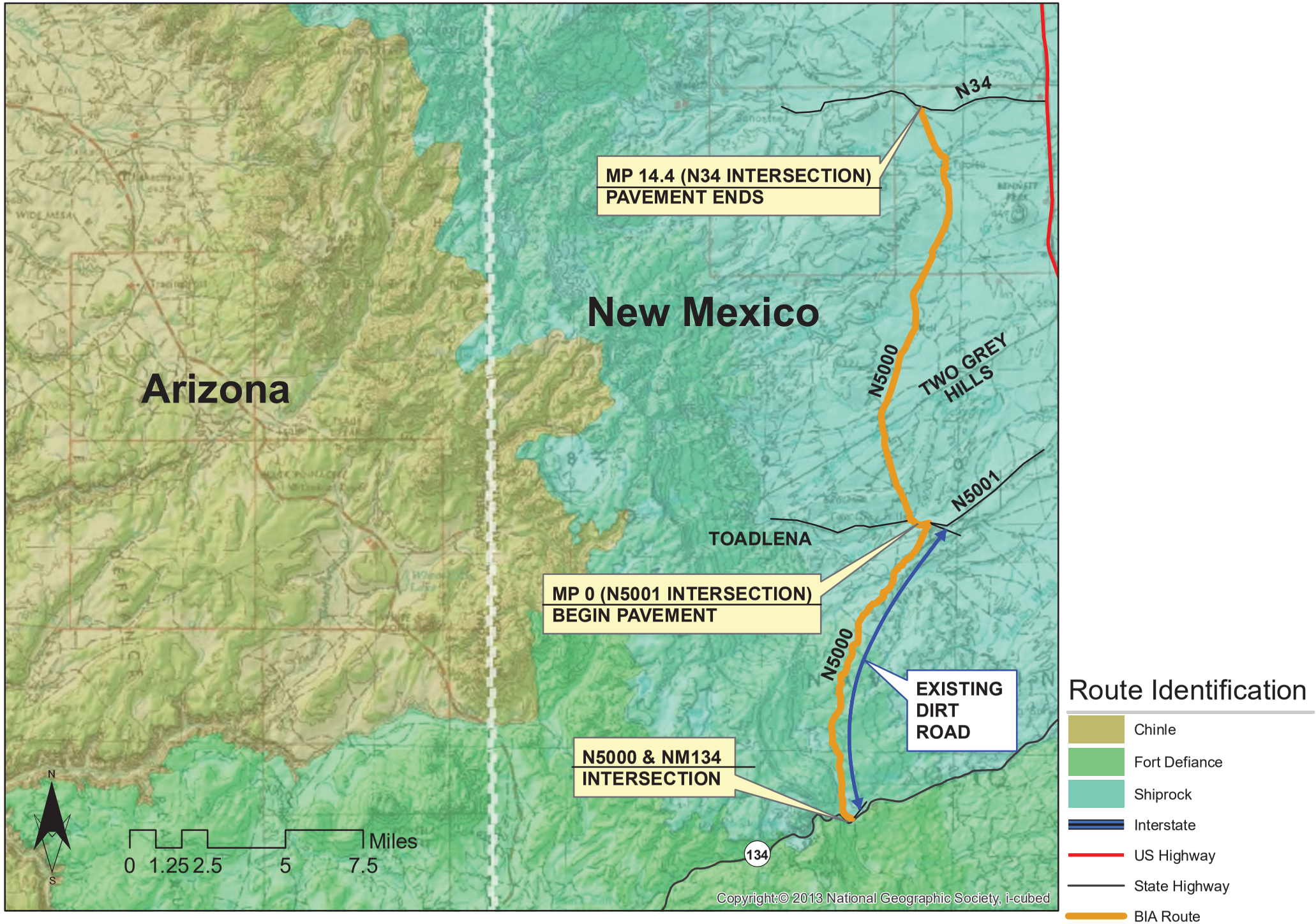
Suggested Mitigations

- Review and determine an environmentally safe mitigation for removing the prairie dogs living along the edge of the road.
- Patching and removal and replace the pavement distress areas.
    - Assume 100 feet of pavement removal for each distress area.
- Crack seal and fog seal the entire project length.
- Apply weed killer to the shoulders.
- Restripe.

Photos

- Field review photos taken on July 19, 2018.

BIA Route 5000



N5000 Field Review, Suggested Mitigations and Photos

Field Review

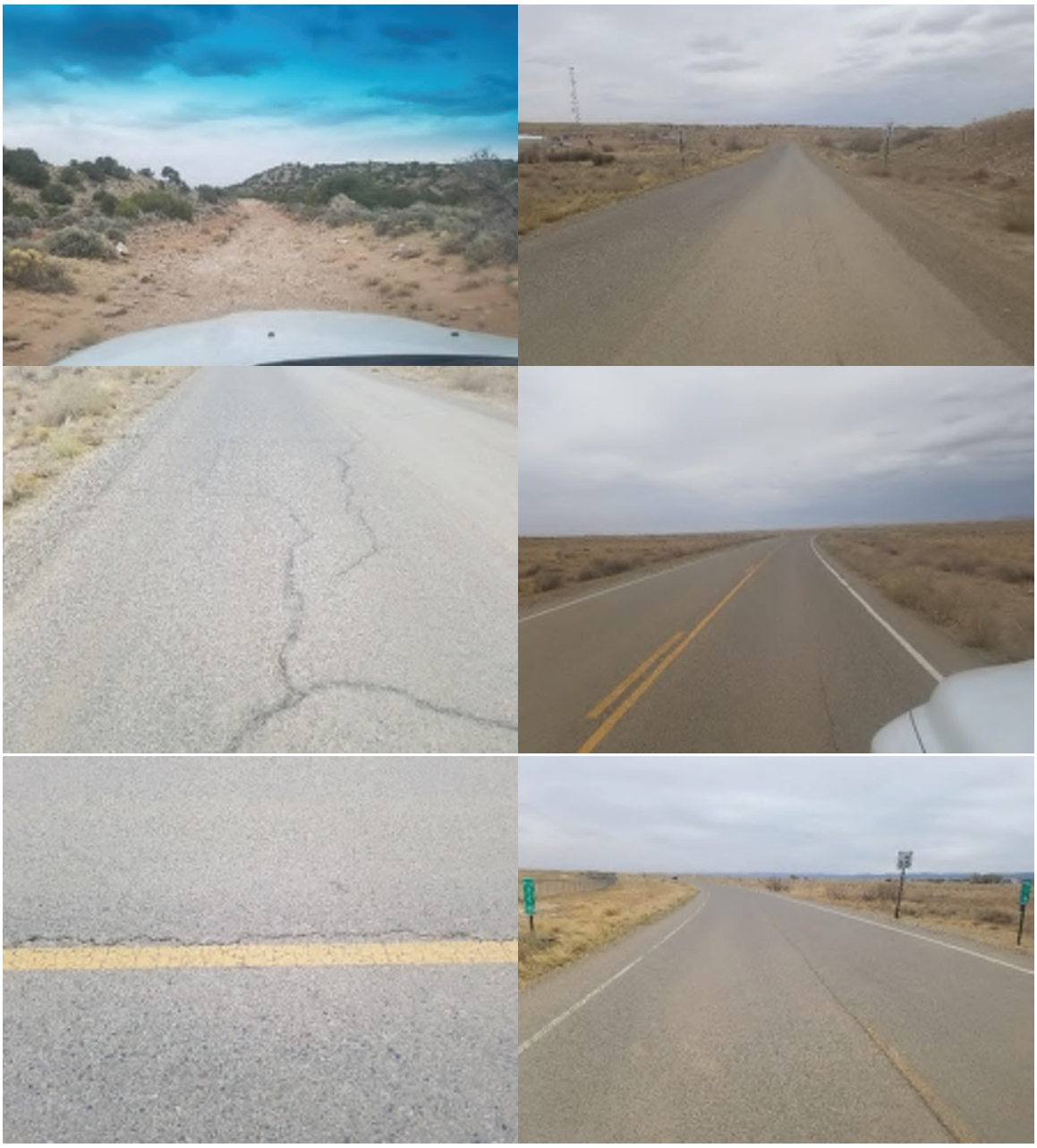
- The first +/- 11.5 miles of N5000 (from NM 134 to N5001) is a rough graded, dirt roadway with a good portion being extremely difficult, rocky/mountainous terrain.
- The paved portion of roadway starts at the N5001 intersection (MP 0) and is in good condition. Two, 12' driving lanes and no shoulders. This 3.6 mile section appears to be a chip seal.
- At MP 3.6 (about ½ mile north of the N19 intersection), the paved roadway appears to be recently reconstructed and paved. Two, 12' driving lanes and 2' shoulders. A lift thickness was not measured.
- RIFDS indicates an age of 10 to 28. The northern paved portion appears to be younger than 10 years old.
- The BIA DMR project length is showing 14.2 miles, which field review agrees with. This conflicts with the MP signing as there was a MP 16 marker near the EOP/Sanostee Day School.
- RIFDS indicates a PCI of 68 - 70.
    - The conditions observed agree with the noted PCI values. See following photos.
- The pavement evaluation indicated the following characteristics:
    - MP 0 – 3.6 = signs of longitudinal/transverse cracking with faded striping
    - MP 3.6 to 14.4 = signs of minor longitudinal cracking with fairly decent striping, pavement is slightly fading in color
        - MP 13.5 has a rougher ride (not as smooth)

Suggested Mitigations

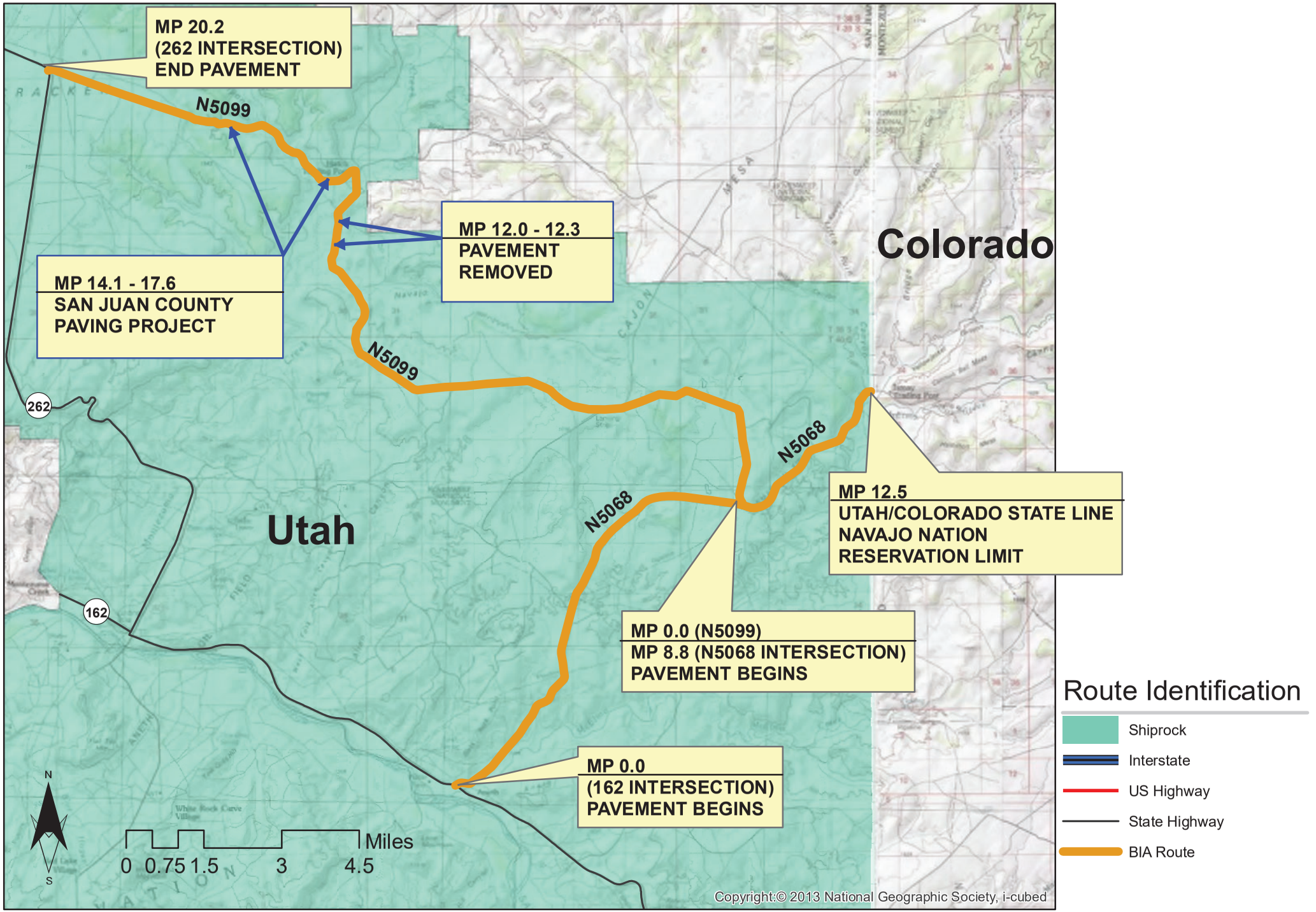
- MP 0 – 3.6 = New striping only.
- MP 3.6 – 14.4 = Defer any maintenance at this time.

Photos

- Field review photos taken on April 19, 2018.



BIA Route 5068 / BIA Route 5099



N5068 Field Review, Suggested Mitigations and Photos

Field Review

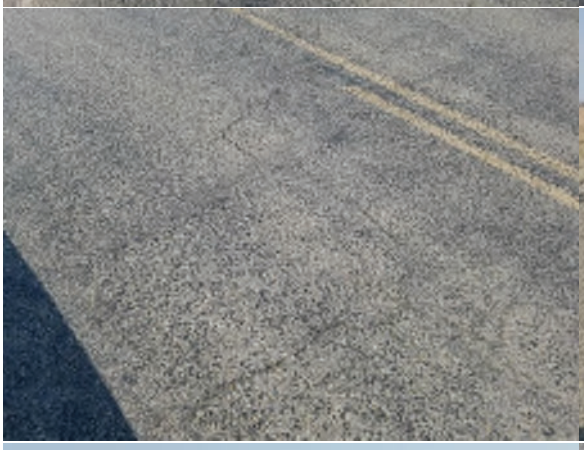
- The roadway appears to be in good condition. Two, 12’ driving lanes and 1.5’ average shoulders.
- Previous maintenance indicates a 2” thick, double-chip seal overlay. The underlying pavement thickness was not measured.
- RIFDS indicates an age of 39, this appears to be correct.
- The BIA DMR project length is showing 10.6 miles (actual length is closer to 12.5 miles).
- RIFDS indicates a PCI of 68.
    - The conditions observed confirm the PCI value of 68. See following photos.
- The pavement evaluation indicated the following characteristics:
    - Faded asphalt color. Striping in bad condition.
    - Weeds were starting to encroach into the cracks on the shoulders.
    - Minor transverse, block and longitudinal cracking.
    - Previous crack sealing has been completed on the corridor, but not for all cracks. The intersection with UT162 was previously fog sealed.
    - A large number of bad areas/distresses (approximately 40 locations) were noted along the corridor at MP 1.4, 1.7, 2, 3, 3.3, 4.2, 4.4-4.6, 5-5.3, 5.9-6, 6.3-6.5, 6.8-6.9, 7.8, 8-8.1, 8.3-8.5, 8.7-8.8, 8.9-9, 9.3-9.5, 9.7, 10.4-10.5, 10.7-10.8, 11-11.1, 11.9.

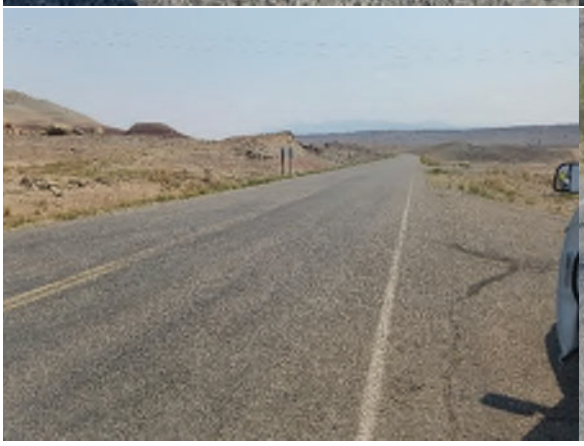
Suggested Mitigations

- Patching and removal and replace the pavement distress areas.
    - Assume 100 feet of pavement removal for each distress area.
- Microsurface overlay the entire project length.
- Apply weed killer to the shoulders.
- Restripe.

Photos

- Field review photos taken on August 14, 2018.





N5099 Field Review, Suggested Mitigations and Photos

Field Review

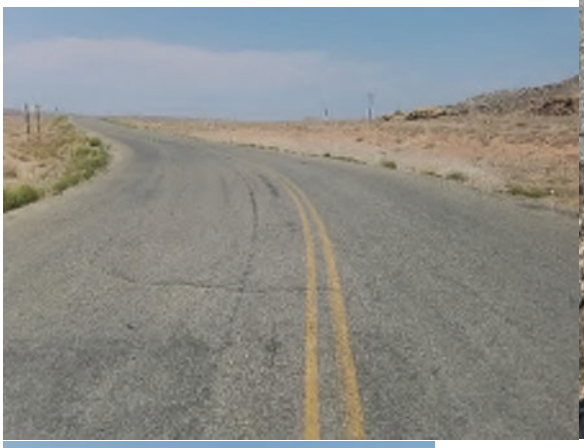
- The roadway appears to be in poor to fair condition. Two 13' driving lanes and no shoulders. Striping consists of only a centerline stripe.
- The project corridor has two distinct pavement conditions.
    - South end from N5068 (MP 0) to MP 14.1.
        - MP 12.0 -12.3 – this section of road is no longer paved, but has reverted back to an aggregate base pavement section.
    - Middle segment from MP 14.1 – 17.6.
        - This 3.5 mile segment was recently reconstructed by San Juan County.
        - The reason behind this specific area being reconstructed is unknown, but it could be related to the deteriorating pavement and drainage issues with the Alkali Canyon arroyo/crossing.
    - North end from MP 17.6 – 20.2 (ends at the UT 262 intersection).
- Previous maintenance indicates a 2" thick, double-chip seal overlay. The underlying pavement thickness was not measured.
- RIFDS indicates an age of 17 to 28, this appears to be incorrect as the pavement is much older.
- The BIA DMR project length is showing 20.2 miles which matches the field review.
- RIFDS indicates a PCI of 50-68.
    - The conditions observed indicate a PCI condition of 30-40 for MP 0 – 14.1 and MP 17.6-20.2. See following photos.
    - Suggest modifying roadway PCI value to 30-40 based on the sections noted above. Some of the distress areas can be considered VERY POOR condition with a PCI in the 20s.
    - The conditions observed indicate a PCI condition of 100 for MP 14.1 - 17.6 base on the recent construction. See following photos.
- The pavement evaluation indicated the following characteristics:
    - Faded asphalt color. Striping in bad condition.
    - Large number of potholes, transverse, block, longitudinal and alligator cracking.
    - Previous patching and crack sealing has been completed on the corridor, but not for all locations.
    - A large number of bad areas/distresses (approximately 26 locations) were noted along the corridor at MP 0.0, 0.2, 0.4, 1.2, 2.8, 3, 3.5-3.8, 4, 6, 9.9, 12.6, 12.8, 13.1, 13.4, 18.7-19.6.

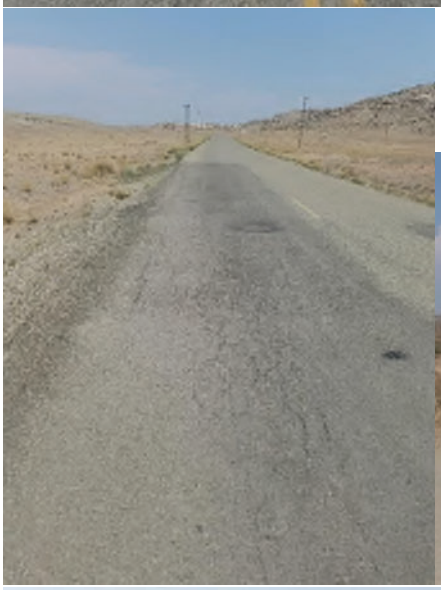
Suggested Mitigations

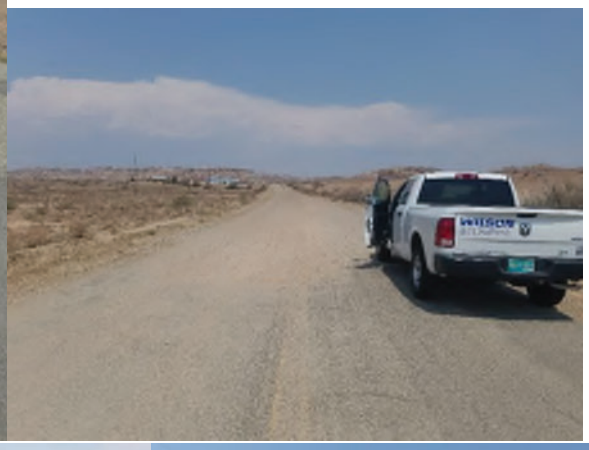
- Patching and removal and replace the pavement distress areas and MP 12 – 12.3.
    - Assume 100 feet of pavement removal for each distress area.
- Microsurface overlay the project length with the exception of MP 14.1 – 17.6.
- Restripe.

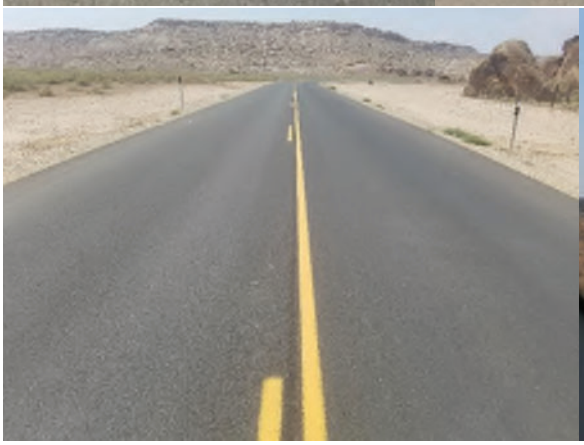
Photos

- Field review photos taken on August 14, 2018.









APPENDIX B

Activity Codes	Activity Description	Work Units	Inventory Needs	Avg. Productions per day	Days	Labor Cost	Equipment Cost	Material Cost	Contract Cost	Total Cost per day	Annual Total Cost	Comments
10	Surface Inspection	Mile	643.60	50 miles	13	$ 232.32	$ 10.45	$ 15.00	$ -	$ 257.77	$ 3,351.01	
11	Grading & Reshaping	Lane Mile	902.20	16 miles	224	$ 337.92	$ 40.00	$ 20.00	$ -	$ 397.92	$ 89,134.08	
12	Crack Sealing	Lane Mile	385.00	5 miles	77	$ 1,425.60	$ 900.00	$ 200.00	$ -	$ 2,525.60	$ 194,471.20	
13	Patching Surface	Square Yards	19,360.00	968 SY	20	$ 2,851.20	$ 1,200.00	$ 8,640.00	$ -	$ 12,691.20	$ 253,824.00	Patchin N474 1.2 Miles
14	Seal Coating	Mile	192.50	10 miles	19	$ 1,425.60	$ 1,200.00	$ 3,000.00	$ -	$ 5,625.60	$ 106,886.40	
15	Repairing Base	Cubic Yards	16,426.67	365 CY	45	$ 2,851.20	$ 1,200.00	$ 600.00	$ -	$ 4,651.20	$ 209,304.00	Reparing N474 1.2 miles
16	Shoulder Maintenance	Lane Mile	250.00	10 miles	25	$ 337.92	$ 40.00	$ 10.00	$ -	$ 387.92	$ 9,698.00	
17	Approuch Work	Each	32.00	1 ea	60	$ 1,425.60	$ 800.00	$ 10.00	$ -	$ 2,235.60	$ 134,136.00	
18	Surface Cleaning	Square Yards	288.89	15 SY	19	$ 1,425.60	$ 150.00	$ 10.00	$ -	$ 1,585.60	$ 30,126.40	
20	Drainage Structure Inspection	Each	300.00	5 ea	60	$ 232.32	$ 12.00	$ 15.00	$ -	$ 259.32	$ 15,559.20	
21	Clean and Reshape Ditches	Lane Mile	250.00	10 lane miles	25	$ 337.92	$ 40.00	$ 10.00	$ -	$ 387.92	$ 9,698.00	
22	Clean Drainage Structures	Each	300.00	2 ea	150	$ 1,182.72	$ 150.00	$ 10.00	$ -	$ 1,342.72	$ 201,408.00	
23	Repair Drianage Structures	Each	300.00	2 ea	150	$ 1,182.72	$ 150.00	$ 10.00	$ -	$ 1,342.72	$ 201,408.00	
24	Repair Curb & Gutter	Feet	72,864.00	7286 feet	10	$ 1,182.72	$ 80.00	$ -	$ -	$ 1,262.72	$ 12,627.20	
25	Repair Maintenance - Outside of ROW	Acre	-	1 acre	0	$ -	$ -	$ -	$ -	$ -	$ -	None
26	Drainage Improvements	Job	-	1	0	$ -	$ -	$ -	$ -	$ -	$ -	None
30	Bridge Cleaning & Inspection	Each	18.00	1	18	$ 1,182.72	$ 80.00	$ 10.00	$ -	$ 1,272.72	$ 22,908.96	
31	Bridge Deck Repairs & Inspection	Each	18.00	1	18	$ 1,182.72	$ 80.00	$ 150.00	$ -	$ 1,412.72	$ 25,428.96	
32	Bridge Superstructure Repairs	Job	-	1	0	$ -	$ -	$ -	$ -	$ -	$ -	None
33	Brdige Substructure Maintenance	Job	-	1	0	$ -	$ -	$ -	$ -	$ -	$ -	None
34	Channel Maintenance	Each	18.00	1	18	$ 1,182.72	$ 160.00	$ 15.00	$ -	$ 1,357.72	$ 24,438.96	
40	Road Patrol	Mile	643.00	50 miles	13	$ 232.32	$ 10.45	$ 15.00	$ -	$ 257.77	$ 3,351.01	
41	Litter Pickup	Mile	192.50	8 miles	24	$ 1,478.40	$ 160.00	$ 15.00	$ -	$ 1,653.40	$ 39,681.60	
42	Mowing & Vegetation Control	Acre	1,400.00	70 Arces	20	$ 591.36	$ 120.00	$ -	$ -	$ 711.36	$ 14,227.20	
43	Brush & Trees	Acre	1,400.00	20 Arces	30	$ 1,182.72	$ 80.00	$ 10.00	$ -	$ 1,272.72	$ 38,181.60	
50	Traffic Control Inspection Sign Cleaning, Washing & Inspection	Each		20 ea	1	$ 1,478.40	$ 80.00					
51	Sign Maintenance - Rpairs and Replace	Each		20 ea	1	$ 1,478.40	$ 80.00					
52	Delineator Maintenance	Each	4,065.00	35 ea	116	$ 929.28	$ 18.10	$ 875.00	$ -	$ 1,822.38	$ 211,395.53	
53	Striping	Mile	192.50	50 ea	10	$ -	$ -	$ -	$ 400,000.00	$ 40,000.00	$ 400,000.00	
54	Signal & Lighting Maintenance	Each	-	1 ea	0	$ -	$ -	$ -	$ -	$ -	$ -	No Signal System
60	Guardrail Maintenance	Feet		20 ft	1							
61	Fence Repairs	Feet	2,032,744.20	42240 ft	50	$ 591.36	$ 80.00	$ 200.00	$ -	$ 871.36	$ 43,568.00	192.5 minus 6.9 N104 and 19 mile of N9(Chpater Fencing)
62	Cattle Guard Clean & Repairs	Each										
63	Slope Protection Repairs	Square Yards	1.00	1	1	$ 1.00	$ 1.00	$ 1.00	$ 85,000.00	$ 1.00	$ 85,000.00	Force Account reparing Conc. Slope Pave on N9
64	Sidewaks Repairs	Square Yards	34,408.00	6800 sy	5	$ 1,182.72	$ 160.00	$ -	$ -	$ 1,342.72	$ 6,713.60	6.9 miles on N104 and N9 Both sides
70	Winter Preparation	Hour	40.00	5 days	5	$ 337.92	$ 160.00	$ -	$ -	$ 497.92	$ 2,489.60	
71	Snow & Ice Control	Mile	192.00	48 Miles	10	$ 2,069.76	$ 160.00	$ 75.00	$ -	$ 2,304.76	$ 23,047.60	
72	Washout Repairs	Each	8.00	1 ea.	8	$ 1,182.72	$ 160.00	$ -	$ -	$ 1,342.72	$ 10,741.76	
73	Slide Repairs	Each	1.00	1/3 Ea.	4	$ 1,182.72	$ 160.00	$ -	$ -	$ 1,342.72	$ 5,370.88	
74	Disister Response	Each	-	8-hrs/day	0	$ -	$ -	$ -	$ -	$ -		None
75	Ferry Maintenance	Hour	-	8-hrs/day	0	$ -	$ -	$ -	$ -	$ -	$ -	NO Ferrys
80	Shop Building Maintenance	Hour	300.00	8-hrs/day	37	$ 338.69	$ -	$ -	$ -	$ 338.69	$ 12,531.46	
81	Equipment Service - PM	Hour	144.00	8-hrs/day	18	$ 1,351.68	$ -	$ 70.00	$ -	$ 1,421.68	$ 25,590.24	
82	Equipment Repairs - minor	Hour	600.00	8-hrs/day	75	$ 591.36	$ -	$ 275.00	$ -	$ 866.36	$ 64,977.00	
83	Equipemnt Repairs - major	Hour	1,040.00	8-hrs/day	130	$ 337.92	$ 52.00	$ 275.00	$ 50,000.00	$ 664.92	$ 136,439.60	
84	Equipment Acquistion	Hour	78.00	8-hrs/day	10	$ 337.92	$ -	$ -	$ -	$ 337.92	$ 3,379.20	
85	Equipment Rental	Day	30.00	month	1	$ -	$ -	$ -	$ 15,000.00	$ 15,000.00	$ 15,000.00	Water Trauck for a Month
90	Leave & Holiday	Hour	720.00	8-hrs/day	90	$ 337.92	$ -	$ -	$ -	$ 337.92	$ 30,412.80	
91	Training	Hour	720.00	8-hrs/day	90	$ 337.92	$ -	$ -	$ -	$ 337.92	$ 30,412.80	
92	Permit Inspection	Hour	416.00	8-hrs/day	52	$ 337.92	$ 40.00	$ -	$ -	$ 377.92	$ 19,651.84	
93	Contract Monitoring	Hour	80.00	8-hrs/day	10	$ 337.92	$ 40.00	$ -	$ -	$ 377.92	$ 3,779.20	
94	General Operation	Hour	1,460.00	8-hrs/day	182.5	$ 464.64	$ 40.00	$ -	$ -	$ 504.64	$ 92,096.80	
95	Maintenance Management Systems	Hour	80.00	8-hrs/day	10	$ 464.64	$ 40.00	$ -	$ -	$ 504.64	$ 5,046.40	
96	Work for Others	Hour	80.00	8-hrs/day	10	$ 337.92	$ 40.00	$ -	$ -	$ 377.92	$ 3,779.20	
97	Travel Time	Hour	4,680.00	8-hrs/day	585	$ 337.92	$ 160.00	$ -	$ -	$ 497.92	$ 291,283.20	
98	Furlough	Hour	-	8-hrs/day	0	$ -	$ -	$ -	$ -	$ -	$ -	No Furloughs
											$ 3,162,556.48	

Indian Reservation Roads Program
Deferred Maintenance Assessment for Roads
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Filter		
Region	Agency	Reservation
N		

N - Navajo
N00 - Navajo Region Off
N00780 - Navajo Region Hdqtrs

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
2002	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460	143	2,317
2003	4	4 - Bitumenous < 2"	4.0	3-Fair	12,300	474	11,826
2004	4	4 - Bitumenous < 2"	1.9	3-Fair	5,843	2,047	3,796
2005	4	4 - Bitumenous < 2"	3.0	3-Fair	9,225	124	9,101
2006	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305	59	4,246
2007	4	4 - Bitumenous < 2"	8.9	3-Fair	27,368	707	26,661
2009	4	4 - Bitumenous < 2"	7.9	3-Fair	24,293	972	23,321
2011	4	1 - Earth Road	0.7	4-Poor	1,628	1,566	62
2011	4	4 - Bitumenous < 2"	8.5	3-Fair	26,138	883	25,255
2012	4	4 - Bitumenous < 2"	0.6	3-Fair	1,845	65	1,780
2015	4	4 - Bitumenous < 2"	3.2	3-Fair	9,840	52	9,788
2016	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	10	3,065
2017	4	4 - Bitumenous < 2"	2.3	3-Fair	7,073	338	6,735
2018	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305	475	3,830
2020	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	105	2,970
2021	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
2025	4	4 - Bitumenous < 2"	5.2	3-Fair	15,990	606	15,384
2030	4	4 - Bitumenous < 2"	12.0	3-Fair	36,900	579	36,321
2302	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
2303	4	4 - Bitumenous < 2"	0.9	3-Fair	2,768		
2304	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460		
2305	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538		
2306	4	4 - Bitumenous < 2"	1.2	3-Fair	3,690		
2309	4	4 - Bitumenous < 2"	1.3	3-Fair	3,998		
2311	4	4 - Bitumenous < 2"	6.4	3-Fair	19,680		
2315	4	4 - Bitumenous < 2"	2.3	3-Fair	7,073		
2316	4	4 - Bitumenous < 2"	0.2	3-Fair	615		
2317	4	4 - Bitumenous < 2"	0.7	3-Fair	2,153		

Indian Reservation Roads Program
Deferred Maintenance Assessment for Roads
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Filter		
Region	Agency	Reservation
N		

N00 - Navajo Region Off
N00780 - Navajo Region Hdqtrs

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
2318	4	4 - Bitumenous < 2"	1.9	3-Fair	5,843		
		Reservation Total:	82.0		251,625	9,205	186,455

N00796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
2002	4	4 - Bitumenous < 2"	1.8	2-Good	2,903		
2007	4	1 - Earth Road	2.3	3-Fair	3,968		
2011	4	1 - Earth Road	0.1	3-Fair	173		
2011	4	4 - Bitumenous < 2"	0.5	2-Good	806		
		Reservation Total:	4.7		7,849		
		Agency Total:	86.7		259,474	9,205	186,455

N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0005	4	4 - Bitumenous < 2"	11.6	4-Poor	46,110		
0005	4	5 - Bitumenous > 2"	15.0	3-Fair	69,188		
0012	4	4 - Bitumenous < 2"	25.8	5-Failing	128,678		
0013	4	5 - Bitumenous > 2"	36.5	4-Poor	229,950	6,409	223,541
0018	4	1 - Earth Road	9.4	5-Failing	29,258		
0019	4	1 - Earth Road	6.1	4-Poor	14,183	294	13,889
0019	4	4 - Bitumenous < 2"	12.2	3-Fair	37,515		
0030	4	1 - Earth Road	42.1	4-Poor	97,883		
0033	4	4 - Bitumenous < 2"	13.1	3-Fair	40,283	1,157	39,126
0034	4	1 - Earth Road	13.3	5-Failing	41,396	815	40,581

Indian Reservation Roads Program
Deferred Maintenance Assessment for Roads
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Filter		
Region	Agency	Reservation
N		

N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0034	4	3 - Gravel Surface	3.4	4-Poor	8,415		
0034	4	4 - Bitumenous < 2"	9.0	4-Poor	35,775	2,038	33,737
0035	4	1 - Earth Road	21.6	3-Fair	37,260	734	36,526
0035	4	4 - Bitumenous < 2"	22.9	3-Fair	70,418		
0035	4	5 - Bitumenous > 2"	6.8	3-Fair	31,365	366	30,999
0036	4	5 - Bitumenous > 2"	29.0	5-Failing	243,600	11,448	232,152
0038	4	1 - Earth Road	4.4	5-Failing	13,695	68	13,627
0056	4	1 - Earth Road	3.4	3-Fair	5,865		
0057	4	1 - Earth Road	1.0	4-Poor	2,325		
0057	4	4 - Bitumenous < 2"	7.2	5-Failing	35,910		
0063	4	1 - Earth Road	3.1	3-Fair	5,348		
0063	4	4 - Bitumenous < 2"	10.6	3-Fair	32,595		
0063	4	9 - Primitive	7.5	4-Poor	13,500		
0068	4	1 - Earth Road	19.3	4-Poor	44,873		
0121	4	1 - Earth Road	5.4	3-Fair	9,315		
0132	4	1 - Earth Road	3.5	4-Poor	8,138		
0133	4	1 - Earth Road	1.5	4-Poor	3,488		
0181	4	1 - Earth Road	4.5	4-Poor	10,463		
0191	4	1 - Earth Road	2.5	4-Poor	5,813		
0192	4	1 - Earth Road	4.4	4-Poor	10,230		
0193	4	1 - Earth Road	3.9	4-Poor	9,068		
0331	4	3 - Gravel Surface	0.7	4-Poor	1,733		
0332	4	1 - Earth Road	4.3	4-Poor	9,998		
0332	4	3 - Gravel Surface	5.4	5-Failing	18,630	145	18,485
0333	4	3 - Gravel Surface	1.4	4-Poor	3,465		
0334	4	1 - Earth Road	6.1	5-Failing	18,986		
0335	4	1 - Earth Road	3.1	4-Poor	7,208		
0336	4	1 - Earth Road	11.2	4-Poor	26,040		

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Filter		
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N		

N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0336	4	9 - Primitive	2.5	4-Poor	4,500		
0342	4	1 - Earth Road	8.9	4-Poor	20,693		
0351	4	1 - Earth Road	3.4	4-Poor	7,905		
0353	4	1 - Earth Road	6.7	4-Poor	15,578		
0354	4	1 - Earth Road	4.5	4-Poor	10,463		
0361	4	1 - Earth Road	2.0	4-Poor	4,650		
0362	4	1 - Earth Road	8.6	4-Poor	19,995	478	19,517
0363	4	1 - Earth Road	1.6	4-Poor	3,720		
0363	4	5 - Bitumenous > 2"	0.1	3-Fair	461		
0364	4	1 - Earth Road	6.4	4-Poor	14,880		
0364	4	3 - Gravel Surface	6.9	4-Poor	17,078		
0364	4	4 - Bitumenous < 2"	7.1	2-Good	11,449	4,168	7,281
0365	4	1 - Earth Road	1.7	4-Poor	3,953	417	3,536
0365	4	5 - Bitumenous > 2"	2.1	4-Poor	13,230		
0366	4	1 - Earth Road	6.1	3-Fair	10,523		
0367	4	1 - Earth Road	3.1	5-Failing	9,649		
0367	4	3 - Gravel Surface	1.6	5-Failing	5,520	2,929	2,591
0368	4	1 - Earth Road	2.1	4-Poor	4,883		
0369	4	1 - Earth Road	0.2	4-Poor	465		
0500	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0501	4	4 - Bitumenous < 2"	1.5	3-Fair	4,613		
0502	4	4 - Bitumenous < 2"	0.9	3-Fair	2,768		
0502	4	5 - Bitumenous > 2"	0.4	3-Fair	1,845		
0503	4	5 - Bitumenous > 2"	0.3	3-Fair	1,384		
0504	4	4 - Bitumenous < 2"	0.7	3-Fair	2,153		
0509	4	4 - Bitumenous < 2"	3.6	5-Failing	17,955		
0510	4	4 - Bitumenous < 2"	0.2	3-Fair	615		
0512	4	4 - Bitumenous < 2"	3.6	3-Fair	11,070		

Indian Reservation Roads Program
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N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0513	4	4 - Bitumenous < 2"	0.1	3-Fair	308		
0514	4	4 - Bitumenous < 2"	0.6	3-Fair	1,845		
0515	4	4 - Bitumenous < 2"	0.3	3-Fair	923		
0530	4	1 - Earth Road	0.4	3-Fair	690		
0531	4	3 - Gravel Surface	0.2	3-Fair	383		
0531	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
0545	4	1 - Earth Road	0.9	2-Good	979		
0545	4	4 - Bitumenous < 2"	0.3	2-Good	484		
0546	4	1 - Earth Road	2.5	5-Failing	7,781	1,414	6,367
0546	4	4 - Bitumenous < 2"	1.7	5-Failing	8,479	707	7,772
0547	4	1 - Earth Road	1.8	4-Poor	4,185	241	3,944
0548	4	1 - Earth Road	2.2	4-Poor	5,115	484	4,631
0549	4	1 - Earth Road	1.9	4-Poor	4,418	707	3,711
0550	4	1 - Earth Road	1.9	4-Poor	4,418	387	4,031
0551	4	4 - Bitumenous < 2"	0.8	4-Poor	3,180		
0552	4	4 - Bitumenous < 2"	2.7	3-Fair	8,303		
0553	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
0556	4	1 - Earth Road	1.2	3-Fair	2,070		
0557	4	1 - Earth Road	1.1	3-Fair	1,898		
0558	4	1 - Earth Road	0.8	3-Fair	1,380		
0559	4	1 - Earth Road	0.6	3-Fair	1,035	69	966
0561	4	1 - Earth Road	0.1	3-Fair	173		
0562	4	1 - Earth Road	1.5	3-Fair	2,588		
0562	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538	1,447	91
0563	4	1 - Earth Road	0.6	3-Fair	1,035		
0564	4	1 - Earth Road	0.5	3-Fair	863		
0565	4	1 - Earth Road	0.3	3-Fair	518		
0566	4	1 - Earth Road	0.3	3-Fair	518		

Indian Reservation Roads Program
Deferred Maintenance Assessment for Roads
Fiscal Year 2017 / Quarter 4

Filter		
Region	Agency	Reservation
N		

N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0569	4	3 - Gravel Surface	1.8	4-Poor	4,455		
0570	4	1 - Earth Road	0.8	4-Poor	1,860		
0571	4	1 - Earth Road	2.4	4-Poor	5,580	103	5,477
0681	4	1 - Earth Road	10.0	4-Poor	23,250		
5000	4	1 - Earth Road	11.4	3-Fair	19,665		
5000	4	4 - Bitumenous < 2"	14.2	4-Poor	56,445	66	56,379
5001	4	1 - Earth Road	12.4	4-Poor	28,830	189	28,641
5002	4	1 - Earth Road	6.9	4-Poor	16,043	65	15,978
5003	4	1 - Earth Road	1.8	4-Poor	4,185		
5004	4	1 - Earth Road	5.2	4-Poor	12,090		
5005	4	1 - Earth Road	8.8	4-Poor	20,460		
5006	4	1 - Earth Road	2.7	4-Poor	6,278		
5007	4	1 - Earth Road	14.8	4-Poor	34,410	221	34,189
5007	4	9 - Primitive	10.0	4-Poor	18,000		
5008	4	1 - Earth Road	0.7	4-Poor	1,628		
5009	4	1 - Earth Road	2.2	4-Poor	5,115		
5010	4	1 - Earth Road	8.8	5-Failing	27,390		
5010	4	5 - Bitumenous > 2"	4.4	3-Fair	20,295		
5010	4	9 - Primitive	2.5	5-Failing	6,000		
5011	4	1 - Earth Road	0.4	4-Poor	930		
5012	4	1 - Earth Road	8.8	4-Poor	20,460		
5012	4	3 - Gravel Surface	5.6	4-Poor	13,860		
5013	4	1 - Earth Road	14.0	4-Poor	32,550		
5014	4	1 - Earth Road	3.7	4-Poor	8,603	139	8,464
5015	4	1 - Earth Road	0.1	4-Poor	233		
5016	4	1 - Earth Road	8.6	4-Poor	19,995		
5017	4	1 - Earth Road	7.1	4-Poor	16,508		
5018	4	1 - Earth Road	0.1	4-Poor	233		

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N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
5018	4	4 - Bitumenous < 2"	0.2	3-Fair	615		
5019	4	1 - Earth Road	2.0	4-Poor	4,650		
5020	4	1 - Earth Road	24.7	3-Fair	42,608	107	42,501
5021	4	1 - Earth Road	4.0	3-Fair	6,900		
5022	4	1 - Earth Road	2.0	4-Poor	4,650		
5023	4	1 - Earth Road	8.3	4-Poor	19,298		
5024	4	1 - Earth Road	2.2	4-Poor	5,115		
5025	4	1 - Earth Road	2.3	4-Poor	5,348		
5026	4	1 - Earth Road	4.3	5-Failing	13,384		
5027	4	1 - Earth Road	1.2	4-Poor	2,790		
5028	4	1 - Earth Road	0.8	4-Poor	1,860		
5029	4	1 - Earth Road	2.1	4-Poor	4,883	258	4,625
5030	4	1 - Earth Road	13.7	4-Poor	31,853		
5031	4	1 - Earth Road	7.8	4-Poor	18,135	191	17,944
5034	4	1 - Earth Road	17.4	4-Poor	40,455	544	39,911
5035	4	1 - Earth Road	6.0	4-Poor	13,950		
5036	4	1 - Earth Road	1.9	4-Poor	4,418		
5037	4	1 - Earth Road	7.0	3-Fair	12,075		
5038	4	1 - Earth Road	1.5	4-Poor	3,488		
5039	4	1 - Earth Road	2.9	4-Poor	6,743		
5040	4	1 - Earth Road	13.4	4-Poor	31,155		
5040	4	9 - Primitive	15.2	4-Poor	27,360	79	27,281
5041	4	1 - Earth Road	0.2	4-Poor	465		
5042	4	1 - Earth Road	3.5	4-Poor	8,138		
5043	4	1 - Earth Road	9.5	4-Poor	22,088		
5045	4	1 - Earth Road	10.7	4-Poor	24,878		
5047	4	1 - Earth Road	8.6	4-Poor	19,995		
5048	4	1 - Earth Road	2.0	4-Poor	4,650		

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
5049	4	1 - Earth Road	3.6	4-Poor	8,370		
5050	4	1 - Earth Road	0.1	4-Poor	233		
5051	4	1 - Earth Road	0.6	4-Poor	1,395		
5052	4	1 - Earth Road	4.4	4-Poor	10,230		
5053	4	1 - Earth Road	3.4	4-Poor	7,905		
5054	4	1 - Earth Road	8.9	4-Poor	20,693	523	20,170
5055	4	1 - Earth Road	3.2	4-Poor	7,440		
5056	4	1 - Earth Road	5.4	4-Poor	12,555		
5057	4	1 - Earth Road	4.4	4-Poor	10,230		
5058	4	1 - Earth Road	8.2	4-Poor	19,065		
5059	4	1 - Earth Road	2.9	4-Poor	6,743	44	6,699
5060	4	1 - Earth Road	17.6	4-Poor	40,920		
5060	4	3 - Gravel Surface	9.1	4-Poor	22,523		
5060	4	4 - Bitumenous < 2"	3.5	4-Poor	13,913		
5061	4	1 - Earth Road	18.3	3-Fair	31,568		
5062	4	1 - Earth Road	4.1	3-Fair	7,073		
5063	4	1 - Earth Road	17.6	3-Fair	30,360	185	30,175
5065	4	1 - Earth Road	7.3	3-Fair	12,593		
5066	4	1 - Earth Road	8.7	3-Fair	15,008		
5067	4	1 - Earth Road	2.5	3-Fair	4,313		
5068	4	4 - Bitumenous < 2"	3.2	3-Fair	9,840		
5068	4	5 - Bitumenous > 2"	10.6	3-Fair	48,893		
5069	4	3 - Gravel Surface	2.7	3-Fair	5,164		
5070	4	1 - Earth Road	3.0	4-Poor	6,975		
5071	4	1 - Earth Road	2.1	4-Poor	4,883		
5072	4	1 - Earth Road	4.7	4-Poor	10,928		
5073	4	1 - Earth Road	0.6	4-Poor	1,395		
5080	4	1 - Earth Road	13.8	4-Poor	32,085		

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
5080	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305		
5081	4	1 - Earth Road	21.3	3-Fair	36,743		
5082	4	1 - Earth Road	13.4	3-Fair	23,115		
5085	4	1 - Earth Road	7.3	3-Fair	12,593		
5087	4	1 - Earth Road	4.0	3-Fair	6,900		
5089	4	1 - Earth Road	7.1	3-Fair	12,248		
5090	4	1 - Earth Road	2.1	3-Fair	3,623		
5091	4	1 - Earth Road	28.2	4-Poor	65,565		
5092	4	1 - Earth Road	5.7	5-Failing	17,741	185	17,556
5094	4	3 - Gravel Surface	0.3	3-Fair	574		
5099	4	1 - Earth Road	0.3	4-Poor	698		
5099	4	4 - Bitumenous < 2"	20.2	3-Fair	62,115	169	61,946
5111	4	1 - Earth Road	7.0	4-Poor	16,275		
5112	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538		
5113	4	1 - Earth Road	11.9	4-Poor	27,668	2,951	24,717
5114	4	5 - Bitumenous > 2"	1.6	3-Fair	7,380	130	7,250
5200	4	1 - Earth Road	2.0	4-Poor	4,650		
5201	4	1 - Earth Road	1.7	4-Poor	3,953		
5203	4	1 - Earth Road	3.5	4-Poor	8,138		
5204	4	1 - Earth Road	2.5	4-Poor	5,813		
5205	4	1 - Earth Road	2.5	4-Poor	5,813		
5206	4	1 - Earth Road	3.6	4-Poor	8,370		
5289	4	1 - Earth Road	0.9	3-Fair	1,553		
8008	4	1 - Earth Road	5.5	5-Failing	17,119	308	16,811
8009	4	1 - Earth Road	17.1	5-Failing	53,224	424	52,800
8014	4	1 - Earth Road	2.7	3-Fair	4,658		
8070	4	1 - Earth Road	17.1	3-Fair	29,498	1,831	27,667
8071	4	1 - Earth Road	4.0	3-Fair	6,900		

N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
8081	4	1 - Earth Road	1.7	4-Poor	3,953		
		Reservation Total:	1,224.1		3,414,885	45,634	1,294,275

N32796 - Navajo Off Res Lands(Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0005	4	5 - Bitumenous > 2"	1.1	4-Poor	6,930		
0012	4	4 - Bitumenous < 2"	0.6	3-Fair	1,845		
0036	4	5 - Bitumenous > 2"	1.1	3-Fair	5,074		
0038	4	1 - Earth Road	2.0	4-Poor	4,650		
5080	4	1 - Earth Road	0.7	4-Poor	1,628		
5091	4	1 - Earth Road	0.3	4-Poor	698		
		Reservation Total:	5.8		20,824		
		Agency Total:	1,229.9		3,435,709	45,634	1,294,275

N33 - Western Navajo
N33780 - Navajo (Western Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0002	4	1 - Earth Road	15.0	3-Fair	25,875	120	25,755
0002	4	3 - Gravel Surface	0.2	3-Fair	383	0	383
0002	4	4 - Bitumenous < 2"	20.6	3-Fair	63,345	0	63,345
0015	4	4 - Bitumenous < 2"	26.0	2-Good	41,925	111,474	0
0015	4	5 - Bitumenous > 2"	10.0	2-Good	29,325	2,914	26,411
0016	4	1 - Earth Road	16.5	3-Fair	28,463	1,836	26,627
0016	4	3 - Gravel Surface	3.5	3-Fair	6,694	0	6,694
0016	4	4 - Bitumenous < 2"	26.9	2-Good	43,376	3,199	40,177

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N33 - Western Navajo
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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0016	4	5 - Bitumenous > 2"	18.4	2-Good	53,958	3,062	50,896
0020	4	4 - Bitumenous < 2"	14.6	3-Fair	44,895	2,656	42,239
0020	4	5 - Bitumenous > 2"	27.5	2-Good	80,644	3,314	77,330
0021	4	1 - Earth Road	10.2	3-Fair	17,595	0	17,595
0021	4	4 - Bitumenous < 2"	10.6	2-Good	17,093	1,859	15,234
0021	4	5 - Bitumenous > 2"	1.6	2-Good	4,692	167	4,525
0021	4	9 - Primitive	30.5	3-Fair	40,031	2,674	37,357
0023	4	1 - Earth Road	7.8	3-Fair	13,455	0	13,455
0024	4	4 - Bitumenous < 2"	4.6	2-Good	7,418	1,125	6,293
0040	4	9 - Primitive	16.2	5-Failing	38,880	0	38,880
0042	4	1 - Earth Road	5.8	3-Fair	10,005	0	10,005
0042	4	4 - Bitumenous < 2"	14.8	3-Fair	45,510	7,457	38,053
0059	4	5 - Bitumenous > 2"	25.1	2-Good	73,606	276	73,330
0061	4	1 - Earth Road	2.6	3-Fair	4,485	0	4,485
0061	4	3 - Gravel Surface	5.6	2-Good	6,510	0	6,510
0061	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305	0	4,305
0070	4	1 - Earth Road	15.3	3-Fair	26,393	1,671	24,722
0071	4	3 - Gravel Surface	4.4	3-Fair	8,415	85	8,330
0071	4	9 - Primitive	7.9	3-Fair	10,369	85	10,284
0106	4	4 - Bitumenous < 2"	2.8	5-Failing	13,965	0	13,965
0118	4	1 - Earth Road	17.9	3-Fair	30,878	0	30,878
0128	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988	0	1,988
0151	4	4 - Bitumenous < 2"	0.3	2-Good	484	0	484
0161	4	1 - Earth Road	6.8	3-Fair	11,730	0	11,730
0162	4	1 - Earth Road	0.7	3-Fair	1,208	0	1,208
0162	4	3 - Gravel Surface	0.1	2-Good	116	0	116
0164	4	3 - Gravel Surface	0.1	3-Fair	191	0	191
0164	4	5 - Bitumenous > 2"	0.3	1-Excellent	377	0	377

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N33 - Western Navajo
N33780 - Navajo (Western Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0201	4	1 - Earth Road	12.1	3-Fair	20,873	0	20,873
0211	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
0212	4	1 - Earth Road	3.2	3-Fair	5,520	334	5,186
0213	4	1 - Earth Road	21.5	3-Fair	37,088	2,005	35,083
0214	4	1 - Earth Road	2.9	3-Fair	5,003	46	4,957
0215	4	1 - Earth Road	13.3	3-Fair	22,943	668	22,275
0221	4	1 - Earth Road	7.5	3-Fair	12,938	0	12,938
0221	4	4 - Bitumenous < 2"	4.5	2-Good	7,256	857	6,399
0221	4	5 - Bitumenous > 2"	0.7	2-Good	2,053	0	2,053
0221	4	9 - Primitive	1.6	3-Fair	2,100	1,294	806
0222	4	5 - Bitumenous > 2"	4.5	2-Good	13,196	0	13,196
0591	4	1 - Earth Road	16.3	3-Fair	28,118	0	28,118
0592	4	1 - Earth Road	2.8	3-Fair	4,830	0	4,830
0593	4	1 - Earth Road	3.4	3-Fair	5,865	0	5,865
0594	4	1 - Earth Road	9.4	4-Poor	21,855	0	21,855
0595	4	1 - Earth Road	3.9	3-Fair	6,728	0	6,728
0600	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305	0	4,305
0601	4	4 - Bitumenous < 2"	0.1	3-Fair	308	0	308
0602	4	4 - Bitumenous < 2"	2.7	3-Fair	8,303	0	8,303
0603	4	4 - Bitumenous < 2"	0.6	2-Good	968	0	968
0604	4	4 - Bitumenous < 2"	3.4	3-Fair	10,455	0	10,455
0606	4	5 - Bitumenous > 2"	0.2	3-Fair	923	0	923
0607	4	5 - Bitumenous > 2"	0.6	2-Good	1,760	0	1,760
0608	4	4 - Bitumenous < 2"	0.4	3-Fair	1,230	0	1,230
0608	4	5 - Bitumenous > 2"	2.7	3-Fair	12,454	0	12,454
0609	4	1 - Earth Road	1.4	3-Fair	2,415	0	2,415
0609	4	4 - Bitumenous < 2"	0.2	3-Fair	615	270	345
0610	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0612	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923
0613	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923
0614	4	4 - Bitumenous < 2"	1.1	3-Fair	3,383	0	3,383
0615	4	4 - Bitumenous < 2"	0.1	3-Fair	308	0	308
0616	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460	0	2,460
0617	4	4 - Bitumenous < 2"	0.2	3-Fair	615	0	615
0618	4	4 - Bitumenous < 2"	0.2	3-Fair	615	0	615
0619	4	1 - Earth Road	4.3	3-Fair	7,418	0	7,418
1011	4	4 - Bitumenous < 2"	0.8	2-Good	1,290	382	908
1012	4	1 - Earth Road	6.5	3-Fair	11,213	165	11,048
1013	4	5 - Bitumenous > 2"	0.2	3-Fair	923	0	923
1015	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460	0	2,460
1015	4	5 - Bitumenous > 2"	0.8	3-Fair	3,690	0	3,690
1017	4	1 - Earth Road	1.1	3-Fair	1,898	0	1,898
1017	4	4 - Bitumenous < 2"	3.7	2-Good	5,966	1,801	4,165
2121	4	1 - Earth Road	2.6	4-Poor	6,045	0	6,045
5910	4	1 - Earth Road	3.8	3-Fair	6,555	0	6,555
6001	4	4 - Bitumenous < 2"	0.1	3-Fair	308	0	308
6002	4	4 - Bitumenous < 2"	0.1	3-Fair	308	0	308
6003	4	4 - Bitumenous < 2"	0.1	3-Fair	308	0	308
6011	4	1 - Earth Road	7.4	3-Fair	12,765	46	12,719
6110	4	1 - Earth Road	15.0	3-Fair	25,875	0	25,875
6120	4	1 - Earth Road	11.6	3-Fair	20,010	0	20,010
6130	4	1 - Earth Road	15.5	3-Fair	26,738	0	26,738
6131	4	1 - Earth Road	4.8	3-Fair	8,280	0	8,280
6132	4	1 - Earth Road	3.8	3-Fair	6,555	0	6,555
6133	4	1 - Earth Road	22.7	3-Fair	39,158	0	39,158
6134	4	1 - Earth Road	20.3	3-Fair	35,018	0	35,018

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
6135	4	1 - Earth Road	2.8	3-Fair	4,830	0	4,830
6135	4	9 - Primitive	14.0	3-Fair	18,375	0	18,375
6140	4	1 - Earth Road	17.0	4-Poor	39,525	0	39,525
6141	4	4 - Bitumenous < 2"	0.2	3-Fair	615	0	615
6145	4	1 - Earth Road	1.3	3-Fair	2,243	0	2,243
6150	4	1 - Earth Road	21.2	3-Fair	36,570	0	36,570
6210	4	1 - Earth Road	13.0	3-Fair	22,425	0	22,425
6211	4	1 - Earth Road	8.7	3-Fair	15,008	0	15,008
6220	4	1 - Earth Road	13.8	4-Poor	32,085	0	32,085
6220	4	3 - Gravel Surface	0.3	3-Fair	574	0	574
6221	4	1 - Earth Road	2.8	3-Fair	4,830	0	4,830
6222	4	1 - Earth Road	2.0	3-Fair	3,450	0	3,450
6230	4	1 - Earth Road	14.3	4-Poor	33,248	117	33,131
6231	4	1 - Earth Road	21.9	4-Poor	50,918	0	50,918
6240	4	1 - Earth Road	1.2	3-Fair	2,070	0	2,070
6260	4	1 - Earth Road	15.9	3-Fair	27,428	2,005	25,423
6261	4	1 - Earth Road	10.3	3-Fair	17,768	1,337	16,431
6262	4	1 - Earth Road	2.0	3-Fair	3,450	334	3,116
6270	4	1 - Earth Road	8.8	3-Fair	15,180	668	14,512
6305	4	9 - Primitive	4.7	4-Poor	8,460	0	8,460
6310	4	1 - Earth Road	49.0	3-Fair	84,525	5,922	78,603
6312	4	1 - Earth Road	7.1	3-Fair	12,248	1,977	10,271
6320	4	1 - Earth Road	12.2	3-Fair	21,045	1,884	19,161
6321	4	1 - Earth Road	4.2	3-Fair	7,245	510	6,735
6322	4	1 - Earth Road	4.6	3-Fair	7,935	1,260	6,675
6325	4	1 - Earth Road	22.6	3-Fair	38,985	52	38,933
6325	4	9 - Primitive	3.6	3-Fair	4,725	0	4,725
6326	4	1 - Earth Road	6.5	3-Fair	11,213	0	11,213

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
6329	4	1 - Earth Road	1.0	3-Fair	1,725	0	1,725
6330	4	1 - Earth Road	32.8	3-Fair	56,580	3,676	52,904
6331	4	1 - Earth Road	3.8	3-Fair	6,555	334	6,221
6331	4	5 - Bitumenous > 2"	1.0	3-Fair	4,613	213	4,400
6400	4	9 - Primitive	7.0	5-Failing	16,800	0	16,800
6410	4	1 - Earth Road	3.9	3-Fair	6,728	0	6,728
6410	4	4 - Bitumenous < 2"	1.7	3-Fair	5,228	1,662	3,566
6420	4	1 - Earth Road	11.2	3-Fair	19,320	465	18,855
6430	4	1 - Earth Road	5.7	3-Fair	9,833	0	9,833
6440	4	1 - Earth Road	20.4	3-Fair	35,190	0	35,190
6444	4	1 - Earth Road	9.2	3-Fair	15,870	0	15,870
6450	4	1 - Earth Road	19.0	4-Poor	44,175	0	44,175
6460	4	1 - Earth Road	24.3	3-Fair	41,918	0	41,918
6460	4	4 - Bitumenous < 2"	0.2	1-Excellent	158	0	158
6461	4	1 - Earth Road	2.9	3-Fair	5,003	0	5,003
6461	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923
6462	4	1 - Earth Road	3.9	3-Fair	6,728	0	6,728
6463	4	1 - Earth Road	5.5	3-Fair	9,488	0	9,488
6465	4	1 - Earth Road	9.6	3-Fair	16,560	0	16,560
6466	4	1 - Earth Road	6.3	3-Fair	10,868	0	10,868
6470	4	3 - Gravel Surface	2.0	3-Fair	3,825	53	3,772
6471	4	1 - Earth Road	3.4	3-Fair	5,865	0	5,865
6480	4	1 - Earth Road	6.2	3-Fair	10,695	0	10,695
6480	4	3 - Gravel Surface	1.0	3-Fair	1,913	0	1,913
6485	4	1 - Earth Road	4.6	3-Fair	7,935	0	7,935
6486	4	1 - Earth Road	9.9	3-Fair	17,078	618	16,460
6487	4	1 - Earth Road	10.8	3-Fair	18,630	0	18,630
6490	4	1 - Earth Road	6.8	3-Fair	11,730	0	11,730

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Region	Agency	Reservation
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N33 - Western Navajo
N33780 - Navajo (Western Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
6491	4	1 - Earth Road	8.0	3-Fair	13,800	0	13,800
6510	4	1 - Earth Road	12.7	3-Fair	21,908	0	21,908
6520	4	1 - Earth Road	4.4	3-Fair	7,590	0	7,590
6530	4	1 - Earth Road	2.9	3-Fair	5,003	0	5,003
6541	4	1 - Earth Road	5.7	3-Fair	9,833	0	9,833
6620	4	1 - Earth Road	6.4	3-Fair	11,040	0	11,040
6710	4	1 - Earth Road	13.0	4-Poor	30,225	0	30,225
6720	4	1 - Earth Road	18.5	3-Fair	31,913	4,679	27,234
6720	4	4 - Bitumenous < 2"	0.8	5-Failing	3,990	4,679	0
6730	4	1 - Earth Road	41.7	3-Fair	71,933	4,191	67,742
6731	4	3 - Gravel Surface	9.4	3-Fair	17,978	0	17,978
6732	4	1 - Earth Road	20.7	3-Fair	35,708	2,339	33,369
6733	4	1 - Earth Road	5.6	4-Poor	13,020	0	13,020
6810	4	1 - Earth Road	9.9	3-Fair	17,078	3,316	13,762
6811	4	1 - Earth Road	7.3	3-Fair	12,593	2,914	9,679
6812	4	1 - Earth Road	4.1	3-Fair	7,073	334	6,739
6820	4	1 - Earth Road	14.8	3-Fair	25,530	1,888	23,642
6822	4	1 - Earth Road	4.9	3-Fair	8,453	894	7,559
6830	4	1 - Earth Road	9.8	3-Fair	16,905	2,970	13,935
6910	4	1 - Earth Road	19.9	3-Fair	34,328	2,339	31,989
6920	4	1 - Earth Road	7.7	3-Fair	13,283	481	12,802
6921	4	1 - Earth Road	5.9	3-Fair	10,178	0	10,178
6922	4	1 - Earth Road	2.4	3-Fair	4,140	0	4,140
6923	4	1 - Earth Road	6.3	3-Fair	10,868	0	10,868
6930	4	1 - Earth Road	11.9	3-Fair	20,528	71	20,457
6931	4	1 - Earth Road	5.7	3-Fair	9,833	0	9,833
6932	4	1 - Earth Road	1.7	3-Fair	2,933	334	2,599
6933	4	1 - Earth Road	4.4	3-Fair	7,590	668	6,922

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N33 - Western Navajo

N33780 - Navajo (Western Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
8071	4	1 - Earth Road	12.9	3-Fair	22,253	0	22,253
		Reservation Total:	1,406.3		2,704,502	207,026	2,567,714

N33796 - Navajo Off Res Lands(Western)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0020	4	4 - Bitumenous < 2"	1.6	4-Poor	6,360	0	6,360
6150	4	4 - Bitumenous < 2"	1.2	3-Fair	3,690	0	3,690
6910	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
6930	4	1 - Earth Road	3.4	4-Poor	7,905	0	7,905
		Reservation Total:	9.0		24,465	0	24,465

N33K80 - Navajo-Hopi Jt. Use (Western)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0002	4	5 - Bitumenous > 2"	9.3	4-Poor	58,590	0	58,590
0021	4	1 - Earth Road	2.1	5-Failing	6,536	23	6,513
6033	4	1 - Earth Road	8.6	5-Failing	26,768	0	26,768
6240	4	1 - Earth Road	4.2	5-Failing	13,073	0	13,073
6250	4	1 - Earth Road	7.6	5-Failing	23,655	0	23,655
6710	4	1 - Earth Road	5.1	3-Fair	8,798	0	8,798
6720	4	1 - Earth Road	20.9	3-Fair	36,053	0	36,053
6730	4	1 - Earth Road	1.7	3-Fair	2,933	0	2,933
		Reservation Total:	59.5		176,404	23	176,381
		Agency Total:	1,474.8		2,905,370	207,049	2,768,559

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N34 - Eastern Navajo
N34723 - Puertocito

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0055	4	1 - Earth Road	23.7	1-Excellent	11,139	6,000	5,139
0055	4	5 - Bitumenous > 2"	7.5	5-Failing	63,000	0	63,000
0541	4	1 - Earth Road	1.0	3-Fair	1,725	0	1,725
0542	4	9 - Primitive	0.8	3-Fair	1,050	0	1,050
0551	4	9 - Primitive	0.8	3-Fair	1,050	0	1,050
0706	4	4 - Bitumenous < 2"	0.4	2-Good	645	202	443
7030	4	1 - Earth Road	3.1	3-Fair	5,348	1,566	3,782
7030	4	3 - Gravel Surface	0.6	3-Fair	1,148	303	845
7031	4	1 - Earth Road	0.5	3-Fair	863	252	611
7032	4	1 - Earth Road	2.9	3-Fair	5,003	1,465	3,538
7033	4	1 - Earth Road	1.9	3-Fair	3,278	960	2,318
7034	4	3 - Gravel Surface	4.9	3-Fair	9,371	2,476	6,895
7035	4	1 - Earth Road	4.5	3-Fair	7,763	2,273	5,490
		Reservation Total:	52.6		111,380	15,497	95,883

N34724 - To'Hajiilee

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0056	4	1 - Earth Road	6.9	3-Fair	11,903	0	11,903
0056	4	4 - Bitumenous < 2"	6.9	3-Fair	21,218	493	20,725
0056	4	5 - Bitumenous > 2"	1.0	3-Fair	4,613	0	4,613
0057	4	1 - Earth Road	10.4	3-Fair	17,940	345	17,595
0058	4	1 - Earth Road	6.4	3-Fair	11,040	0	11,040
0059	4	1 - Earth Road	5.4	3-Fair	9,315	0	9,315
0561	4	9 - Primitive	3.6	3-Fair	4,725	0	4,725
0716	4	4 - Bitumenous < 2"	0.5	2-Good	806	0	806
7036	4	1 - Earth Road	1.6	3-Fair	2,760	0	2,760
7037	4	1 - Earth Road	2.6	3-Fair	4,485	0	4,485

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N34 - Eastern Navajo
N34724 - To'Hajiilee

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
7038	4	1 - Earth Road	1.0	3-Fair	1,725	0	1,725
7039	4	1 - Earth Road	3.6	3-Fair	6,210	0	6,210
7041	4	1 - Earth Road	2.0	3-Fair	3,450	0	3,450
7042	4	1 - Earth Road	4.1	3-Fair	7,073	0	7,073
7071	4	1 - Earth Road	1.5	3-Fair	2,588	0	2,588
7072	4	1 - Earth Road	0.5	3-Fair	863	0	863
7073	4	1 - Earth Road	1.4	3-Fair	2,415	0	2,415
7074	4	1 - Earth Road	0.8	3-Fair	1,380	0	1,380
7075	4	1 - Earth Road	1.9	3-Fair	3,278	0	3,278
7076	4	1 - Earth Road	4.8	3-Fair	8,280	0	8,280
7077	4	1 - Earth Road	0.8	3-Fair	1,380	0	1,380
		Reservation Total:	67.7		127,444	838	126,606

N34780 - Navajo (Eastern Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0009	4	4 - Bitumenous < 2"	5.5	2-Good	8,869	1,897	6,972
0009	4	5 - Bitumenous > 2"	5.8	2-Good	17,009	1,897	15,112
0052	4	1 - Earth Road	4.4	3-Fair	7,590	0	7,590
0098	4	1 - Earth Road	4.0	3-Fair	6,900	319	6,581
7009	4	1 - Earth Road	3.1	3-Fair	5,348	0	5,348
7021	4	1 - Earth Road	4.3	3-Fair	7,418	0	7,418
7049	4	1 - Earth Road	5.1	3-Fair	8,798	0	8,798
7057	4	1 - Earth Road	28.9	3-Fair	49,853	0	49,853
7057	4	4 - Bitumenous < 2"	0.7	2-Good	1,129	0	1,129
7060	4	1 - Earth Road	4.1	3-Fair	7,073	319	6,754
7101	4	1 - Earth Road	2.7	3-Fair	4,658	0	4,658
7122	4	1 - Earth Road	2.2	3-Fair	3,795	0	3,795

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N34 - Eastern Navajo

N34780 - Navajo (Eastern Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
7123	4	1 - Earth Road	1.9	3-Fair	3,278	0	3,278
7124	4	1 - Earth Road	6.4	3-Fair	11,040	0	11,040
7126	4	1 - Earth Road	2.7	3-Fair	4,658	0	4,658
7141	4	1 - Earth Road	0.3	3-Fair	518	0	518
9652	4	1 - Earth Road	6.0	3-Fair	10,350	1,342	9,008
		Reservation Total:	88.1		158,279	5,774	152,505

N34796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0009	4	4 - Bitumenous < 2"	37.9	3-Fair	116,543	0	116,543
0009	4	5 - Bitumenous > 2"	29.5	3-Fair	136,069	1,897	134,172
0011	4	1 - Earth Road	12.4	3-Fair	21,390	2,868	18,522
0011	4	4 - Bitumenous < 2"	12.2	2-Good	19,673	2,868	16,805
0046	4	1 - Earth Road	22.0	3-Fair	37,950	1,089	36,861
0046	4	5 - Bitumenous > 2"	1.9	3-Fair	8,764	0	8,764
0047	4	9 - Primitive	5.9	3-Fair	7,744	0	7,744
0048	4	1 - Earth Road	7.5	3-Fair	12,938	0	12,938
0048	4	4 - Bitumenous < 2"	10.2	3-Fair	31,365	1,529	29,836
0049	4	4 - Bitumenous < 2"	0.4	3-Fair	1,230	0	1,230
0049	4	5 - Bitumenous > 2"	12.0	3-Fair	55,350	6,243	49,107
0050	4	1 - Earth Road	7.0	3-Fair	12,075	639	11,436
0052	4	1 - Earth Road	2.1	3-Fair	3,623	0	3,623
0091	4	1 - Earth Road	9.0	3-Fair	15,525	0	15,525
0093	4	1 - Earth Road	4.8	3-Fair	8,280	357	7,923
0111	4	1 - Earth Road	1.9	3-Fair	3,278	0	3,278
0112	4	1 - Earth Road	0.8	3-Fair	1,380	0	1,380
0471	4	1 - Earth Road	11.9	3-Fair	20,528	0	20,528

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N34 - Eastern Navajo
N34796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0473	4	1 - Earth Road	6.4	3-Fair	11,040	0	11,040
0474	4	1 - Earth Road	6.5	3-Fair	11,213	0	11,213
0474	4	4 - Bitumenous < 2"	11.9	5-Failing	59,351	3,786	55,565
0475	4	1 - Earth Road	8.9	3-Fair	15,353	0	15,353
0476	4	1 - Earth Road	6.9	3-Fair	11,903	0	11,903
0481	4	1 - Earth Road	18.4	3-Fair	31,740	0	31,740
0482	4	1 - Earth Road	6.5	3-Fair	11,213	0	11,213
0483	4	1 - Earth Road	5.1	3-Fair	8,798	0	8,798
0485	4	1 - Earth Road	8.0	3-Fair	13,800	319	13,481
0486	4	1 - Earth Road	3.5	3-Fair	6,038	2,574	3,464
0488	4	1 - Earth Road	1.0	3-Fair	1,725	0	1,725
0489	4	1 - Earth Road	1.6	3-Fair	2,760	639	2,121
0491	4	1 - Earth Road	4.3	3-Fair	7,418	0	7,418
0492	4	1 - Earth Road	2.9	3-Fair	5,003	319	4,684
0493	4	1 - Earth Road	5.1	3-Fair	8,798	319	8,479
0701	4	4 - Bitumenous < 2"	1.2	3-Fair	3,690	0	3,690
0703	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538	0	1,538
0704	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538	0	1,538
0705	4	4 - Bitumenous < 2"	0.9	3-Fair	2,768	0	2,768
1040	4	1 - Earth Road	0.5	2-Good	544	0	544
1040	4	4 - Bitumenous < 2"	0.7	2-Good	1,129	2,074	0
1040	4	5 - Bitumenous > 2"	0.9	2-Good	2,639	0	2,639
1041	4	4 - Bitumenous < 2"	0.6	2-Good	968	0	968
1042	4	4 - Bitumenous < 2"	2.4	2-Good	3,870	0	3,870
1043	4	5 - Bitumenous > 2"	0.3	2-Good	880	0	880
1044	4	4 - Bitumenous < 2"	0.1	2-Good	161	0	161
1045	4	4 - Bitumenous < 2"	0.6	2-Good	968	0	968
1046	4	4 - Bitumenous < 2"	0.2	2-Good	323	0	323

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N34 - Eastern Navajo
N34796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
1047	4	4 - Bitumenous < 2"	0.3	2-Good	484	0	484
1048	4	4 - Bitumenous < 2"	0.8	2-Good	1,290	0	1,290
7004	4	1 - Earth Road	22.4	3-Fair	38,640	1,316	37,324
7005	4	1 - Earth Road	1.6	3-Fair	2,760	0	2,760
7008	4	1 - Earth Road	2.3	3-Fair	3,968	0	3,968
7009	4	1 - Earth Road	1.1	3-Fair	1,898	0	1,898
7013	4	1 - Earth Road	1.1	3-Fair	1,898	0	1,898
7014	4	1 - Earth Road	2.9	3-Fair	5,003	0	5,003
7017	4	1 - Earth Road	2.2	3-Fair	3,795	0	3,795
7029	4	1 - Earth Road	1.0	3-Fair	1,725	0	1,725
7044	4	4 - Bitumenous < 2"	3.1	5-Failing	15,461	664	14,797
7046	4	4 - Bitumenous < 2"	13.2	2-Good	21,285	18,257	3,028
7052	4	1 - Earth Road	3.7	3-Fair	6,383	0	6,383
7052	4	9 - Primitive	1.3	3-Fair	1,706	0	1,706
7053	4	1 - Earth Road	1.9	3-Fair	3,278	319	2,959
7054	4	1 - Earth Road	8.0	3-Fair	13,800	275	13,525
7059	4	1 - Earth Road	7.4	3-Fair	12,765	639	12,126
7062	4	4 - Bitumenous < 2"	7.5	3-Fair	23,063	753	22,310
7101	4	9 - Primitive	4.6	3-Fair	6,038	0	6,038
7111	4	1 - Earth Road	2.8	3-Fair	4,830	0	4,830
7113	4	1 - Earth Road	8.5	3-Fair	14,663	639	14,024
7114	4	1 - Earth Road	5.3	3-Fair	9,143	0	9,143
7117	4	1 - Earth Road	0.8	3-Fair	1,380	0	1,380
7119	4	1 - Earth Road	1.2	3-Fair	2,070	0	2,070
7120	4	4 - Bitumenous < 2"	0.1	3-Fair	308	0	308
7120	4	5 - Bitumenous > 2"	0.6	3-Fair	2,768	0	2,768
7128	4	1 - Earth Road	8.4	3-Fair	14,490	0	14,490
7129	4	1 - Earth Road	2.5	3-Fair	4,313	0	4,313

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N34 - Eastern Navajo
N34796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
7130	4	1 - Earth Road	1.0	3-Fair	1,725	0	1,725
7131	4	9 - Primitive	0.2	3-Fair	263	0	263
7132	4	1 - Earth Road	4.4	3-Fair	7,590	0	7,590
7133	4	1 - Earth Road	4.3	3-Fair	7,418	0	7,418
7134	4	1 - Earth Road	2.0	3-Fair	3,450	0	3,450
7135	4	1 - Earth Road	3.0	3-Fair	5,175	0	5,175
7136	4	1 - Earth Road	8.8	3-Fair	15,180	850	14,330
7140	4	4 - Bitumenous < 2"	9.9	4-Poor	39,353	4,488	34,865
7141	4	1 - Earth Road	3.1	3-Fair	5,348	0	5,348
7273	4	5 - Bitumenous > 2"	0.7	2-Good	2,053	0	2,053
		Reservation Total:	449.8		1,047,614	55,720	992,840
		Agency Total:	658.2		1,444,717	77,829	1,367,833

N35 - Chinle
N35780 - Navajo (Chinle)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0004	4	1 - Earth Road	9.0	4-Poor	20,925	4,008	16,917
0004	4	4 - Bitumenous < 2"	22.7	3-Fair	69,803	6,144	63,659
0004	4	5 - Bitumenous > 2"	14.2	2-Good	41,642	3,843	37,799
0007	4	1 - Earth Road	18.9	4-Poor	43,943	1,262	42,681
0007	4	4 - Bitumenous < 2"	11.5	3-Fair	35,363	0	35,363
0007	4	5 - Bitumenous > 2"	2.2	3-Fair	10,148	22,090	0
0012	4	4 - Bitumenous < 2"	38.0	4-Poor	151,050	5,992	145,058
0013	4	5 - Bitumenous > 2"	9.4	3-Fair	43,358	1,162	42,196
0018	4	1 - Earth Road	17.4	4-Poor	40,455	889	39,566
0025	4	1 - Earth Road	12.4	4-Poor	28,830	0	28,830

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N35 - Chinle
N35780 - Navajo (Chinle)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0025	4	4 - Bitumenous < 2"	2.3	4-Poor	9,143	231	8,912
0026	4	1 - Earth Road	15.6	4-Poor	36,270		
0027	4	1 - Earth Road	9.8	4-Poor	22,785	6,756	16,029
0027	4	5 - Bitumenous > 2"	14.7	3-Fair	67,804	205	67,599
0029	4	1 - Earth Road	23.8	4-Poor	55,335	1,753	53,582
0029	4	4 - Bitumenous < 2"	7.0	4-Poor	27,825	504	27,321
0041	4	1 - Earth Road	7.6	4-Poor	17,670	461	17,209
0041	4	4 - Bitumenous < 2"	21.3	4-Poor	84,668	12,471	72,197
0059	4	5 - Bitumenous > 2"	20.6	4-Poor	129,780	1,631	128,149
0060	4	1 - Earth Road	1.4	4-Poor	3,255	686	2,569
0060	4	4 - Bitumenous < 2"	1.6	4-Poor	6,360		
0061	4	1 - Earth Road	7.2	4-Poor	16,740		
0064	4	4 - Bitumenous < 2"	24.4	3-Fair	75,030	4,092	70,938
0065	4	4 - Bitumenous < 2"	7.6	4-Poor	30,210	581	29,629
0067	4	1 - Earth Road	11.2	4-Poor	26,040	861	25,179
0067	4	4 - Bitumenous < 2"	2.0	4-Poor	7,950	147	7,803
0100	4	1 - Earth Road	0.7	4-Poor	1,628		
0100	4	4 - Bitumenous < 2"	0.7	4-Poor	2,783		
0100	4	5 - Bitumenous > 2"	0.1	3-Fair	461		
0101	4	4 - Bitumenous < 2"	0.2	1-Excellent	158		
0102	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
0104	4	4 - Bitumenous < 2"	0.2	1-Excellent	158		
0105	4	4 - Bitumenous < 2"	0.4	5-Failing	1,995		
0106	4	4 - Bitumenous < 2"	0.2	4-Poor	795	562	233
0109	4	1 - Earth Road	0.2	4-Poor	465		
0109	4	4 - Bitumenous < 2"	1.5	4-Poor	5,963		
0131	4	1 - Earth Road	3.2	4-Poor	7,440	866	6,574
0131	4	4 - Bitumenous < 2"	0.2	4-Poor	795		

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N35 - Chinle
N35780 - Navajo (Chinle)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0132	4	1 - Earth Road	2.3	4-Poor	5,348		
0133	4	1 - Earth Road	2.3	4-Poor	5,348		
0133	4	4 - Bitumenous < 2"	0.4	4-Poor	1,590		
0134	4	1 - Earth Road	2.7	4-Poor	6,278	112	6,166
0135	4	1 - Earth Road	0.9	4-Poor	2,093	527	1,566
0136	4	1 - Earth Road	2.9	4-Poor	6,743	2,181	4,562
0171	4	1 - Earth Road	7.4	4-Poor	17,205	1,202	16,003
0172	4	1 - Earth Road	11.9	4-Poor	27,668	20,888	6,780
0172	4	4 - Bitumenous < 2"	0.2	5-Failing	998		
0200	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0201	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0202	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0203	4	4 - Bitumenous < 2"	5.6	1-Excellent	4,410		
0205	4	4 - Bitumenous < 2"	0.1	5-Failing	499		
0206	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0251	4	1 - Earth Road	2.0	4-Poor	4,650		
0251	4	4 - Bitumenous < 2"	29.3	5-Failing	146,134	3,837	142,297
0271	4	1 - Earth Road	3.2	4-Poor	7,440		
0271	4	4 - Bitumenous < 2"	0.5	2-Good	806		
0291	4	4 - Bitumenous < 2"	0.7	4-Poor	2,783		
0300	4	1 - Earth Road	0.1	3-Fair	173		
0301	4	1 - Earth Road	0.1	4-Poor	233		
0302	4	1 - Earth Road	0.3	4-Poor	698		
0302	4	4 - Bitumenous < 2"	0.2	2-Good	323		
0303	4	4 - Bitumenous < 2"	0.7	4-Poor	2,783		
0400	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0403	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0405	4	4 - Bitumenous < 2"	0.1	4-Poor	398		

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0406	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0597	4	4 - Bitumenous < 2"	0.4	4-Poor	1,590		
0601	4	4 - Bitumenous < 2"	0.4	4-Poor	1,590		
0641	4	1 - Earth Road	2.7	4-Poor	6,278	48	6,230
0672	4	1 - Earth Road	5.4	4-Poor	12,555		
0673	4	1 - Earth Road	2.2	4-Poor	5,115	508	4,607
0702	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193		
0800	4	4 - Bitumenous < 2"	0.1	5-Failing	499		
0801	4	4 - Bitumenous < 2"	1.2	4-Poor	4,770		
0803	4	4 - Bitumenous < 2"	0.2	4-Poor	795		
0804	4	4 - Bitumenous < 2"	0.2	4-Poor	795		
0806	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0810	4	1 - Earth Road	0.2	4-Poor	465		
8008	4	1 - Earth Road	1.4	4-Poor	3,255	1,110	2,145
8009	4	1 - Earth Road	5.6	4-Poor	13,020	2,330	10,690
8015	4	1 - Earth Road	13.3	4-Poor	30,923	244	30,679
8016	4	1 - Earth Road	6.3	4-Poor	14,648	602	14,046
8017	4	1 - Earth Road	4.5	4-Poor	10,463	65	10,398
8018	4	1 - Earth Road	3.8	4-Poor	8,835	65	8,770
8027	4	1 - Earth Road	15.7	4-Poor	36,503	8,233	28,270
8027	4	4 - Bitumenous < 2"	0.3	3-Fair	923		
8028	4	1 - Earth Road	8.7	4-Poor	20,228	918	19,310
8029	4	1 - Earth Road	15.6	4-Poor	36,270	831	35,439
8030	4	1 - Earth Road	25.3	4-Poor	58,823	1,937	56,886
8030	4	4 - Bitumenous < 2"	1.6	2-Good	2,580	3,437	0
8031	4	1 - Earth Road	12.1	4-Poor	28,133	3,463	24,670
8031	4	3 - Gravel Surface	0.5	4-Poor	1,238		
8031	4	4 - Bitumenous < 2"	5.5	3-Fair	16,913		

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
8032	4	1 - Earth Road	9.9	4-Poor	23,018	1,686	21,332
8033	4	1 - Earth Road	6.5	4-Poor	15,113	687	14,426
8033	4	9 - Primitive	5.7	5-Failing	13,680		
8034	4	1 - Earth Road	24.9	4-Poor	57,893	3,586	54,307
8042	4	1 - Earth Road	7.8	4-Poor	18,135		
8043	4	1 - Earth Road	10.8	4-Poor	25,110		
8059	4	1 - Earth Road	20.1	4-Poor	46,733	1,329	45,404
8060	4	1 - Earth Road	4.9	4-Poor	11,393	845	10,548
8061	4	1 - Earth Road	2.4	4-Poor	5,580	332	5,248
8062	4	1 - Earth Road	11.0	4-Poor	25,575	782	24,793
8063	4	1 - Earth Road	7.1	4-Poor	16,508		
8065	4	1 - Earth Road	9.9	4-Poor	23,018	935	22,083
8066	4	1 - Earth Road	24.2	4-Poor	56,265	805	55,460
8066	4	4 - Bitumenous < 2"	2.4	3-Fair	7,380		
8066	4	5 - Bitumenous > 2"	8.6	3-Fair	39,668	1,813	37,855
8067	4	1 - Earth Road	4.8	4-Poor	11,160	889	10,271
8068	4	1 - Earth Road	20.7	4-Poor	48,128	1,747	46,381
8069	4	1 - Earth Road	4.2	4-Poor	9,765		
8072	4	1 - Earth Road	5.6	4-Poor	13,020		
8073	4	1 - Earth Road	17.6	4-Poor	40,920	1,720	39,200
8074	4	1 - Earth Road	7.9	4-Poor	18,368	1,363	17,005
8076	4	1 - Earth Road	10.5	4-Poor	24,413	48	24,365
8077	4	1 - Earth Road	16.2	4-Poor	37,665	634	37,031
8077	4	4 - Bitumenous < 2"	1.4	2-Good	2,258		
8077	4	9 - Primitive	5.5	4-Poor	9,900		
8078	4	1 - Earth Road	4.1	4-Poor	9,533		
8078	4	4 - Bitumenous < 2"	1.8	2-Good	2,903		
8079	4	1 - Earth Road	5.9	4-Poor	13,718		

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
8080	4	3 - Gravel Surface	10.7	4-Poor	26,483		
8082	4	1 - Earth Road	9.1	4-Poor	21,158	66	21,092
8083	4	1 - Earth Road	10.4	4-Poor	24,180	390	23,790
8084	4	1 - Earth Road	21.3	4-Poor	49,523	8,673	40,850
8085	4	1 - Earth Road	4.9	4-Poor	11,393	87	11,306
8086	4	1 - Earth Road	17.6	4-Poor	40,920	2,309	38,611
8087	4	1 - Earth Road	2.8	4-Poor	6,510		
8088	4	1 - Earth Road	11.3	4-Poor	26,273	1,024	25,249
8089	4	1 - Earth Road	10.2	4-Poor	23,715		
8090	4	1 - Earth Road	33.3	4-Poor	77,423	6,724	70,699
8091	4	1 - Earth Road	1.5	4-Poor	3,488	633	2,855
8092	4	1 - Earth Road	1.1	4-Poor	2,558	1,650	908
8094	4	1 - Earth Road	9.4	4-Poor	21,855	2,802	19,053
8094	4	5 - Bitumenous > 2"	2.2	3-Fair	10,148		
8095	4	1 - Earth Road	3.8	3-Fair	6,555	14,187	0
		Reservation Total:	962.6		2,673,249	187,481	2,135,610

N35K80 - Navajo-Hopi Jt. Use

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0004	4	1 - Earth Road	10.5	4-Poor	24,413		
0041	4	3 - Gravel Surface	4.5	4-Poor	11,138		
0060	4	4 - Bitumenous < 2"	2.1	3-Fair	6,458		
0061	4	1 - Earth Road	1.4	3-Fair	2,415		
0065	4	1 - Earth Road	2.7	3-Fair	4,658		
8027	4	1 - Earth Road	16.6	4-Poor	38,595		
8029	4	1 - Earth Road	3.7	4-Poor	8,603		
8031	4	1 - Earth Road	5.0	4-Poor	11,625		

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N35 - Chinle
N35K80 - Navajo-Hopi Jt. Use

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
8060	4	1 - Earth Road	0.7	4-Poor	1,628		
8062	4	1 - Earth Road	1.2	4-Poor	2,790		
8074	4	1 - Earth Road	0.7	4-Poor	1,628		
		Reservation Total:	49.1		113,948		
		Agency Total:	1,011.7		2,787,197	187,481	2,135,610

N36 - Fort Defiance
N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0006	4	4 - Bitumenous < 2"	36.3	3-Fair	111,623	10,962	100,661
0007	4	1 - Earth Road	5.5	4-Poor	12,788	1,193	11,595
0007	4	4 - Bitumenous < 2"	15.9	4-Poor	63,203	4,801	58,402
0009	4	5 - Bitumenous > 2"	20.0	2-Good	58,650	6,040	52,610
0012	4	4 - Bitumenous < 2"	21.9	3-Fair	67,343	6,613	60,730
0012	4	5 - Bitumenous > 2"	36.1	3-Fair	166,511	10,902	155,609
0015	4	4 - Bitumenous < 2"	67.4	3-Fair	207,255	20,354	186,901
0025	4	1 - Earth Road	9.5	4-Poor	22,088	2,061	20,027
0026	4	1 - Earth Road	2.8	4-Poor	6,510	607	5,903
0027	4	4 - Bitumenous < 2"	4.5	3-Fair	13,838	224	13,614
0027	4	5 - Bitumenous > 2"	8.2	3-Fair	37,823	980	36,843
0028	4	1 - Earth Road	35.4	4-Poor	82,305	3,255	79,050
0028	4	4 - Bitumenous < 2"	0.2	5-Failing	998	0	998
0030	4	1 - Earth Road	28.9	4-Poor	67,193	6,155	61,038
0030	4	4 - Bitumenous < 2"	3.0	3-Fair	9,225	0	9,225
0031	4	1 - Earth Road	14.9	5-Failing	46,376	368	46,008
0031	4	5 - Bitumenous > 2"	3.0	2-Good	8,798	652	8,146

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N36 - Fort Defiance
N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0031	4	9 - Primitive	1.2	5-Failing	2,880	0	2,880
0037	4	1 - Earth Road	18.9	4-Poor	43,943	0	43,943
0039	4	1 - Earth Road	4.8	4-Poor	11,160	0	11,160
0039	4	4 - Bitumenous < 2"	1.0	2-Good	1,613	0	1,613
0039	4	5 - Bitumenous > 2"	1.4	2-Good	4,106	650	3,456
0054	4	4 - Bitumenous < 2"	0.6	2-Good	968	124	844
0054	4	5 - Bitumenous > 2"	9.9	3-Fair	45,664	2,989	42,675
0060	4	4 - Bitumenous < 2"	25.1	4-Poor	99,773	7,580	92,193
0069	4	1 - Earth Road	12.1	4-Poor	28,133	2,625	25,508
0096	4	1 - Earth Road	12.3	4-Poor	28,598	0	28,598
0100	4	4 - Bitumenous < 2"	2.3	3-Fair	7,073	694	6,379
0108	4	1 - Earth Road	0.2	4-Poor	465	0	465
0108	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988	0	1,988
0110	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628
0110	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	302	2,773
0110	4	5 - Bitumenous > 2"	0.1	4-Poor	630	0	630
0111	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
0112	4	1 - Earth Road	11.9	4-Poor	27,668	0	27,668
0112	4	4 - Bitumenous < 2"	7.8	4-Poor	31,005	2,355	28,650
0113	4	1 - Earth Road	0.5	4-Poor	1,163	0	1,163
0113	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193	0	1,193
0123	4	1 - Earth Road	2.5	4-Poor	5,813	542	5,271
0123	4	3 - Gravel Surface	0.6	3-Fair	1,148	140	1,008
0124	4	1 - Earth Road	10.6	4-Poor	24,645	0	24,645
0125	4	1 - Earth Road	3.7	4-Poor	8,603	0	8,603
0126	4	9 - Primitive	11.7	5-Failing	28,080	0	28,080
0130	4	4 - Bitumenous < 2"	3.0	3-Fair	9,225	0	9,225
0131	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628

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N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0132	4	4 - Bitumenous < 2"	0.6	3-Fair	1,845	0	1,845
0135	4	1 - Earth Road	0.3	4-Poor	698	0	698
0136	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	0	3,075
0137	4	4 - Bitumenous < 2"	1.5	3-Fair	4,613	0	4,613
0138	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	0	3,075
0151	4	1 - Earth Road	4.2	4-Poor	9,765	0	9,765
0151	4	4 - Bitumenous < 2"	1.1	3-Fair	3,383	0	3,383
0152	4	1 - Earth Road	1.5	4-Poor	3,488	0	3,488
0153	4	1 - Earth Road	15.5	4-Poor	36,038	0	36,038
0153	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988	0	1,988
0154	4	1 - Earth Road	5.8	4-Poor	13,485	0	13,485
0155	4	1 - Earth Road	8.5	4-Poor	19,763	1,844	17,919
0156	4	1 - Earth Road	3.7	4-Poor	8,603	0	8,603
0157	4	1 - Earth Road	23.4	4-Poor	54,405	3,689	50,716
0157	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988	0	1,988
0203	4	1 - Earth Road	23.4	4-Poor	54,405	0	54,405
0203	4	3 - Gravel Surface	1.0	4-Poor	2,475	0	2,475
0203	4	9 - Primitive	11.2	4-Poor	20,160	0	20,160
0321	4	1 - Earth Road	16.7	4-Poor	38,828	0	38,828
0321	4	4 - Bitumenous < 2"	0.2	5-Failing	998	0	998
0372	4	1 - Earth Road	2.4	4-Poor	5,580	0	5,580
0391	4	4 - Bitumenous < 2"	0.5	2-Good	806	0	806
0541	4	1 - Earth Road	0.3	4-Poor	698	0	698
0542	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923
0543	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193	0	1,193
0544	4	4 - Bitumenous < 2"	0.4	4-Poor	1,590	0	1,590
0601	4	1 - Earth Road	3.9	4-Poor	9,068	0	9,068
0602	4	4 - Bitumenous < 2"	2.6	5-Failing	12,968	785	12,183

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0603	4	1 - Earth Road	7.7	4-Poor	17,903	0	17,903
0691	4	1 - Earth Road	5.2	4-Poor	12,090	1,128	10,962
0692	4	1 - Earth Road	2.0	4-Poor	4,650	0	4,650
0693	4	1 - Earth Road	3.9	4-Poor	9,068	846	8,222
0693	4	4 - Bitumenous < 2"	0.5	2-Good	806	0	806
0694	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
9000	4	1 - Earth Road	7.7	4-Poor	17,903	1,670	16,233
9001	4	1 - Earth Road	13.1	4-Poor	30,458	0	30,458
9001	4	4 - Bitumenous < 2"	0.7	3-Fair	2,153	0	2,153
9002	4	1 - Earth Road	9.6	4-Poor	22,320	2,083	20,237
9003	4	1 - Earth Road	29.1	4-Poor	67,658	0	67,658
9004	4	1 - Earth Road	3.5	4-Poor	8,138	0	8,138
9005	4	1 - Earth Road	10.4	4-Poor	24,180	0	24,180
9010	4	1 - Earth Road	34.5	4-Poor	80,213	2,170	78,043
9010	4	4 - Bitumenous < 2"	11.8	1-Excellent	9,293	489	8,804
9011	4	1 - Earth Road	8.5	4-Poor	19,763	0	19,763
9012	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
9014	4	1 - Earth Road	3.3	4-Poor	7,673	0	7,673
9031	4	1 - Earth Road	15.1	4-Poor	35,108	3,276	31,832
9031	4	4 - Bitumenous < 2"	2.8	5-Failing	13,965	0	13,965
9051	4	1 - Earth Road	8.6	4-Poor	19,995	0	19,995
9052	4	1 - Earth Road	11.1	4-Poor	25,808	2,408	23,400
9053	4	1 - Earth Road	7.0	4-Poor	16,275	1,519	14,756
9054	4	1 - Earth Road	5.6	4-Poor	13,020	1,215	11,805
9055	4	1 - Earth Road	9.5	4-Poor	22,088	0	22,088
9056	4	1 - Earth Road	4.0	4-Poor	9,300	0	9,300
9057	4	1 - Earth Road	12.5	4-Poor	29,063	2,712	26,351
9061	4	1 - Earth Road	4.0	4-Poor	9,300	0	9,300

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
9062	4	1 - Earth Road	11.1	4-Poor	25,808	0	25,808
9065	4	1 - Earth Road	19.4	4-Poor	45,105	0	45,105
9066	4	1 - Earth Road	3.1	4-Poor	7,208	0	7,208
9067	4	1 - Earth Road	1.3	4-Poor	3,023	0	3,023
9068	4	1 - Earth Road	6.0	4-Poor	13,950	0	13,950
9069	4	1 - Earth Road	1.7	4-Poor	3,953	0	3,953
9073	4	1 - Earth Road	2.0	4-Poor	4,650	434	4,216
9074	4	9 - Primitive	1.1	5-Failing	2,640	0	2,640
9101	4	1 - Earth Road	9.4	4-Poor	21,855	0	21,855
9101	4	5 - Bitumenous > 2"	2.2	3-Fair	10,148	650	9,498
9102	4	1 - Earth Road	7.6	3-Fair	13,110	0	13,110
9103	4	1 - Earth Road	3.1	4-Poor	7,208	0	7,208
9155	4	1 - Earth Road	7.3	4-Poor	16,973	0	16,973
9157	4	1 - Earth Road	3.0	4-Poor	6,975	0	6,975
9201	4	1 - Earth Road	5.8	4-Poor	13,485	0	13,485
9202	4	1 - Earth Road	1.0	4-Poor	2,325	0	2,325
9202	4	4 - Bitumenous < 2"	1.3	3-Fair	3,998	0	3,998
9205	4	1 - Earth Road	3.9	4-Poor	9,068	0	9,068
9252	4	1 - Earth Road	1.6	4-Poor	3,720	0	3,720
9304	4	1 - Earth Road	6.7	4-Poor	15,578	0	15,578
9310	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628
9311	4	1 - Earth Road	1.6	4-Poor	3,720	0	3,720
9345	4	1 - Earth Road	1.5	4-Poor	3,488	0	3,488
9345	4	4 - Bitumenous < 2"	1.4	2-Good	2,258	0	2,258
9351	4	1 - Earth Road	5.3	4-Poor	12,323	0	12,323
9352	4	1 - Earth Road	5.8	4-Poor	13,485	1,258	12,227
9353	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
9355	4	1 - Earth Road	14.6	4-Poor	33,945	0	33,945

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N36 - Fort Defiance
N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
9401	4	1 - Earth Road	10.7	4-Poor	24,878	0	24,878
9402	4	1 - Earth Road	19.6	4-Poor	45,570	1,736	43,834
9402	4	3 - Gravel Surface	0.6	3-Fair	1,148	0	1,148
9402	4	4 - Bitumenous < 2"	0.4	5-Failing	1,995	0	1,995
9404	4	1 - Earth Road	9.4	4-Poor	21,855	0	21,855
9405	4	1 - Earth Road	6.7	4-Poor	15,578	0	15,578
9406	4	1 - Earth Road	5.0	4-Poor	11,625	1,085	10,540
9408	4	1 - Earth Road	3.2	4-Poor	7,440	0	7,440
9410	4	1 - Earth Road	9.9	5-Failing	30,814	0	30,814
9411	4	1 - Earth Road	3.1	4-Poor	7,208	0	7,208
9450	4	1 - Earth Road	0.7	5-Failing	2,179	0	2,179
9451	4	1 - Earth Road	1.2	5-Failing	3,735	0	3,735
9452	4	1 - Earth Road	1.9	4-Poor	4,418	0	4,418
9501	4	1 - Earth Road	9.5	4-Poor	22,088	0	22,088
9502	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
9503	4	1 - Earth Road	3.1	4-Poor	7,208	0	7,208
9504	4	1 - Earth Road	4.6	4-Poor	10,695	0	10,695
9551	4	1 - Earth Road	2.6	4-Poor	6,045	0	6,045
9603	4	1 - Earth Road	1.6	4-Poor	3,720	0	3,720
9604	4	1 - Earth Road	5.6	4-Poor	13,020	0	13,020
9606	4	1 - Earth Road	15.9	4-Poor	36,968	0	36,968
9652	4	1 - Earth Road	17.3	4-Poor	40,223	3,754	36,469
9653	4	1 - Earth Road	9.5	4-Poor	22,088	0	22,088
9654	4	1 - Earth Road	3.1	4-Poor	7,208	0	7,208
9655	4	1 - Earth Road	9.1	4-Poor	21,158	1,974	19,184
9658	4	1 - Earth Road	12.3	4-Poor	28,598	0	28,598
9659	4	1 - Earth Road	7.1	4-Poor	16,508	0	16,508
9660	4	1 - Earth Road	6.3	4-Poor	14,648	0	14,648

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Filter		
Region	Agency	Reservation
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N36 - Fort Defiance
N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
9702	4	1 - Earth Road	14.7	4-Poor	34,178	0	34,178
9703	4	1 - Earth Road	15.0	4-Poor	34,875	3,255	31,620
9751	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628
9752	4	1 - Earth Road	9.4	4-Poor	21,855	0	21,855
9753	4	1 - Earth Road	3.5	4-Poor	8,138	0	8,138
9753	4	9 - Primitive	3.0	5-Failing	7,200	0	7,200
9754	4	1 - Earth Road	3.7	4-Poor	8,603	0	8,603
9760	4	1 - Earth Road	3.8	4-Poor	8,835	0	8,835
9801	4	1 - Earth Road	2.7	4-Poor	6,278	0	6,278
9803	4	9 - Primitive	7.2	4-Poor	12,960	0	12,960
9806	4	1 - Earth Road	8.5	4-Poor	19,763	0	19,763
9811	4	1 - Earth Road	7.3	4-Poor	16,973	0	16,973
9813	4	1 - Earth Road	5.5	4-Poor	12,788	0	12,788
9840	4	1 - Earth Road	5.0	4-Poor	11,625	0	11,625
9841	4	1 - Earth Road	3.0	4-Poor	6,975	0	6,975
9843	4	1 - Earth Road	5.4	4-Poor	12,555	0	12,555
9844	4	1 - Earth Road	8.2	4-Poor	19,065	0	19,065
9845	4	1 - Earth Road	4.0	4-Poor	9,300	0	9,300
9846	4	1 - Earth Road	5.0	4-Poor	11,625	0	11,625
9854	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
9855	4	1 - Earth Road	2.4	4-Poor	5,580	0	5,580
9856	4	9 - Primitive	1.1	5-Failing	2,640	0	2,640
9857	4	1 - Earth Road	12.0	4-Poor	27,900	2,604	25,296
9858	4	1 - Earth Road	7.5	4-Poor	17,438	1,627	15,811
9859	4	1 - Earth Road	2.2	4-Poor	5,115	477	4,638
9860	4	1 - Earth Road	21.3	4-Poor	49,523	2,604	46,919
9863	4	1 - Earth Road	1.4	4-Poor	3,255	0	3,255
9864	4	1 - Earth Road	6.6	4-Poor	15,345	0	15,345

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N36 - Fort Defiance

N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
9901	4	1 - Earth Road	10.0	4-Poor	23,250	0	23,250
		Reservation Total:	1,322.9		3,418,132	140,460	3,277,672

N36796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0054	4	5 - Bitumenous > 2"	1.0	3-Fair	4,613	302	4,311
9402	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
9405	4	1 - Earth Road	0.8	4-Poor	1,860	0	1,860
		Reservation Total:	4.6		12,983	302	12,681

N36K80 - Navajo-Hopi Jt. Use

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0006	4	4 - Bitumenous < 2"	4.4	3-Fair	13,530	1,328	12,202
9000	4	1 - Earth Road	1.3	4-Poor	3,023	282	2,741
9062	4	1 - Earth Road	10.1	4-Poor	23,483	0	23,483
9101	4	1 - Earth Road	5.6	4-Poor	13,020	0	13,020
9102	4	1 - Earth Road	0.6	4-Poor	1,395	0	1,395
9751	4	1 - Earth Road	7.0	4-Poor	16,275	0	16,275
9759	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
9760	4	1 - Earth Road	1.6	4-Poor	3,720	0	3,720
		Reservation Total:	31.8		77,235	1,610	75,625
		Agency Total:	1,359.3		3,508,349	142,372	3,365,977

Indian Reservation Roads Program
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Filter		
Region	Agency	Reservation
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N48 - Niip
N48780 - Navajo (Niip)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0101	4	1 - Earth Road	0.5	4-Poor	1,163		
3003	4	4 - Bitumenous < 2"	2.1	3-Fair	6,458		
3003	4	5 - Bitumenous > 2"	6.0	3-Fair	27,675	157	27,518
3005	4	4 - Bitumenous < 2"	13.9	3-Fair	42,743	376	42,367
4050	4	4 - Bitumenous < 2"	6.3	3-Fair	19,373	77	19,296
4055	4	4 - Bitumenous < 2"	9.8	3-Fair	30,135		
4055	4	5 - Bitumenous > 2"	1.1	3-Fair	5,074	477	4,597
4056	4	4 - Bitumenous < 2"	1.5	4-Poor	5,963		
4057	4	4 - Bitumenous < 2"	0.9	4-Poor	3,578		
4059	4	4 - Bitumenous < 2"	3.5	4-Poor	13,913		
4061	4	4 - Bitumenous < 2"	0.4	2-Good	645		
4062	4	4 - Bitumenous < 2"	4.3	3-Fair	13,223		
4062	4	5 - Bitumenous > 2"	1.7	3-Fair	7,841		
4063	4	4 - Bitumenous < 2"	3.9	3-Fair	11,993	28	11,965
4064	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538		
4065	4	4 - Bitumenous < 2"	15.3	3-Fair	47,048		
4066	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
4067	4	4 - Bitumenous < 2"	5.7	3-Fair	17,528		
4068	4	4 - Bitumenous < 2"	0.3	3-Fair	923		
4069	4	4 - Bitumenous < 2"	0.1	5-Failing	499		
4070	4	4 - Bitumenous < 2"	1.1	3-Fair	3,383		
4072	4	4 - Bitumenous < 2"	1.2	3-Fair	3,690		
4073	4	4 - Bitumenous < 2"	2.0	3-Fair	6,150		
4077	4	4 - Bitumenous < 2"	3.8	4-Poor	15,105		
4078	4	5 - Bitumenous > 2"	0.8	5-Failing	6,720		
4080	4	4 - Bitumenous < 2"	0.6	4-Poor	2,385		
4081	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988		
4082	4	4 - Bitumenous < 2"	0.2	5-Failing	998		

N48 - Niip

N48780 - Navajo (Niip)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
4083	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193		
4085	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305		
4087	4	4 - Bitumenous < 2"	3.5	3-Fair	10,763		
4093	4	4 - Bitumenous < 2"	8.7	3-Fair	26,753		
4095	4	4 - Bitumenous < 2"	5.1	3-Fair	15,683	259	15,424
4103	4	4 - Bitumenous < 2"	1.3	5-Failing	6,484		
4104	4	4 - Bitumenous < 2"	2.0	4-Poor	7,950		
4109	4	4 - Bitumenous < 2"	0.4	5-Failing	1,995		
4111	4	4 - Bitumenous < 2"	2.5	5-Failing	12,469		
4150	4	5 - Bitumenous > 2"	4.9	3-Fair	22,601		
4154	4	5 - Bitumenous > 2"	4.1	3-Fair	18,911		
4155	4	5 - Bitumenous > 2"	1.8	3-Fair	8,303		
4164	4	5 - Bitumenous > 2"	1.4	3-Fair	6,458		
		Reservation Total:	126.4		444,664	1,374	121,165

N48796 - Navajo Off Res Lands (Niip)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
3002	4	4 - Bitumenous < 2"	9.7	2-Good	15,641	28	15,613
3003	4	4 - Bitumenous < 2"	9.3	4-Poor	36,968	39,317	0
3003	4	5 - Bitumenous > 2"	7.3	3-Fair	33,671	41,602	0
4001	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988		
4002	4	4 - Bitumenous < 2"	8.2	3-Fair	25,215	1,107	24,108
4003	4	4 - Bitumenous < 2"	1.9	4-Poor	7,553		
4005	4	4 - Bitumenous < 2"	2.0	3-Fair	6,150		
4006	4	4 - Bitumenous < 2"	3.1	3-Fair	9,533		
4007	4	4 - Bitumenous < 2"	4.4	5-Failing	21,945		
4011	4	4 - Bitumenous < 2"	1.8	3-Fair	5,535		

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N48 - Niip
N48796 - Navajo Off Res Lands (Niip)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
4014	4	4 - Bitumenous < 2"	4.4	5-Failing	21,945	100	21,845
4017	4	4 - Bitumenous < 2"	9.7	5-Failing	48,379		
4018	4	4 - Bitumenous < 2"	0.7	3-Fair	2,153		
4022	4	4 - Bitumenous < 2"	7.4	2-Good	11,933	455	11,478
4028	4	4 - Bitumenous < 2"	3.6	3-Fair	11,070		
4030	4	4 - Bitumenous < 2"	0.8	4-Poor	3,180		
4035	4	4 - Bitumenous < 2"	8.7	2-Good	14,029	1,937	12,092
4040	4	4 - Bitumenous < 2"	2.6	3-Fair	7,995		
4043	4	4 - Bitumenous < 2"	4.6	4-Poor	18,285		
4045	4	4 - Bitumenous < 2"	2.2	4-Poor	8,745		
4047	4	4 - Bitumenous < 2"	9.5	4-Poor	37,763		
4049	4	4 - Bitumenous < 2"	4.2	3-Fair	12,915		
4060	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
4100	4	4 - Bitumenous < 2"	1.3	2-Good	2,096		
4101	4	4 - Bitumenous < 2"	1.3	2-Good	2,096		
4121	4	4 - Bitumenous < 2"	4.8	4-Poor	19,080		
4123	4	4 - Bitumenous < 2"	3.3	4-Poor	13,118		
4140	4	4 - Bitumenous < 2"	2.1	3-Fair	6,458		
4142	4	4 - Bitumenous < 2"	1.5	3-Fair	4,613		
4145	4	5 - Bitumenous > 2"	2.3	2-Good	6,745		
4146	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
4146	4	5 - Bitumenous > 2"	2.0	3-Fair	9,225		
4156	4	5 - Bitumenous > 2"	1.1	3-Fair	5,074		
4178	4	5 - Bitumenous > 2"	7.2	2-Good	21,114	28	21,086
		Reservation Total:	135.5		458,355	84,574	106,222
		Agency Total:	261.9		903,019	85,948	227,386

Region Total:	6,082.5	15,243,834	755,518	11,346,095

Report Total (filtered):	6,082.5	15,243,834	755,518	11,346,095

Indian Reservation Roads Program
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Filter		
Region	Agency	Reservation
N		

N - Navajo
N00 - Navajo Region Off
N00780 - Navajo Region Hdqtrs

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
2002	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460	500	1,960
2003	4	4 - Bitumenous < 2"	4.0	3-Fair	12,300	378	11,922
2004	4	4 - Bitumenous < 2"	1.9	3-Fair	5,843	125	5,718
2005	4	4 - Bitumenous < 2"	3.0	3-Fair	9,225		
2006	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305	376	3,929
2007	4	4 - Bitumenous < 2"	8.9	3-Fair	27,368	315	27,053
2009	4	4 - Bitumenous < 2"	7.9	3-Fair	24,293	473	23,820
2011	4	1 - Earth Road	0.7	4-Poor	1,628		
2011	4	4 - Bitumenous < 2"	8.5	3-Fair	26,138	1,734	24,404
2012	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305	189	4,116
2015	4	4 - Bitumenous < 2"	3.2	3-Fair	9,840	1,073	8,767
2016	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	278	2,797
2017	4	4 - Bitumenous < 2"	2.3	3-Fair	7,073	945	6,128
2018	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305	227	4,078
2020	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	193	2,882
2021	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	198	2,877
2025	4	4 - Bitumenous < 2"	5.2	3-Fair	15,990	2,178	13,812
2030	4	4 - Bitumenous < 2"	12.0	3-Fair	36,900	693	36,207
2302	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
2303	4	4 - Bitumenous < 2"	0.9	3-Fair	2,768		
2304	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460		
2305	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538		
2306	4	4 - Bitumenous < 2"	1.2	3-Fair	3,690		
2309	4	4 - Bitumenous < 2"	1.3	3-Fair	3,998		
2311	4	4 - Bitumenous < 2"	6.4	3-Fair	19,680		
2312	4	4 - Bitumenous < 2"	0.3	3-Fair	923		
2315	4	4 - Bitumenous < 2"	2.3	3-Fair	7,073		
2316	4	4 - Bitumenous < 2"	0.2	3-Fair	615		

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Region	Agency	Reservation
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N00 - Navajo Region Off
N00780 - Navajo Region Hdqtrs

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
2317	4	4 - Bitumenous < 2"	0.7	3-Fair	2,153		
2318	4	4 - Bitumenous < 2"	1.9	3-Fair	5,843		
2320	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460		
		Reservation Total:	83.9		257,468	9,875	180,468

N00796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
2002	4	4 - Bitumenous < 2"	1.8	2-Good	2,903	50	2,853
2007	4	1 - Earth Road	2.3	3-Fair	3,968		
2011	4	1 - Earth Road	0.1	3-Fair	173		
2011	4	4 - Bitumenous < 2"	0.5	2-Good	806		
		Reservation Total:	4.7		7,849	50	2,853
		Agency Total:	88.6		265,316	9,925	183,320

N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0005	4	5 - Bitumenous > 2"	26.6	3-Fair	122,693		
0012	4	4 - Bitumenous < 2"	25.8	5-Failing	128,678		
0013	4	5 - Bitumenous > 2"	35.5	4-Poor	223,650		
0018	4	1 - Earth Road	9.4	5-Failing	29,258		
0019	4	1 - Earth Road	6.1	4-Poor	14,183		
0019	4	4 - Bitumenous < 2"	12.2	3-Fair	37,515		
0030	4	1 - Earth Road	42.1	4-Poor	97,883		
0033	4	4 - Bitumenous < 2"	13.2	3-Fair	40,590		

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N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0034	4	1 - Earth Road	13.3	5-Failing	41,396		
0034	4	3 - Gravel Surface	3.4	4-Poor	8,415		
0034	4	4 - Bitumenous < 2"	9.0	3-Fair	27,675		
0035	4	1 - Earth Road	20.2	3-Fair	34,845		
0035	4	4 - Bitumenous < 2"	24.3	4-Poor	96,593		
0035	4	5 - Bitumenous > 2"	6.8	3-Fair	31,365		
0036	4	5 - Bitumenous > 2"	29.0	5-Failing	243,600		
0038	4	1 - Earth Road	4.4	5-Failing	13,695		
0056	4	1 - Earth Road	3.4	3-Fair	5,865		
0057	4	1 - Earth Road	1.0	4-Poor	2,325		
0057	4	4 - Bitumenous < 2"	7.2	5-Failing	35,910		
0063	4	1 - Earth Road	10.6	3-Fair	18,285		
0063	4	4 - Bitumenous < 2"	10.6	3-Fair	32,595		
0068	4	1 - Earth Road	19.3	4-Poor	44,873		
0121	4	1 - Earth Road	5.4	3-Fair	9,315		
0132	4	1 - Earth Road	3.5	4-Poor	8,138		
0133	4	1 - Earth Road	1.5	4-Poor	3,488		
0181	4	1 - Earth Road	4.5	4-Poor	10,463		
0191	4	1 - Earth Road	2.5	4-Poor	5,813		
0192	4	1 - Earth Road	4.4	4-Poor	10,230		
0193	4	1 - Earth Road	3.9	4-Poor	9,068		
0331	4	3 - Gravel Surface	0.7	4-Poor	1,733		
0332	4	1 - Earth Road	4.3	4-Poor	9,998		
0332	4	3 - Gravel Surface	5.4	5-Failing	18,630		
0333	4	3 - Gravel Surface	1.4	4-Poor	3,465		
0334	4	1 - Earth Road	6.1	5-Failing	18,986		
0335	4	1 - Earth Road	3.1	4-Poor	7,208		
0336	4	1 - Earth Road	11.2	4-Poor	26,040		

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Filter		
Region	Agency	Reservation
N		

N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0336	4	9 - Primitive	2.5	4-Poor	4,500		
0342	4	1 - Earth Road	8.9	4-Poor	20,693		
0351	4	1 - Earth Road	3.4	4-Poor	7,905		
0353	4	1 - Earth Road	6.7	4-Poor	15,578		
0354	4	1 - Earth Road	4.5	4-Poor	10,463		
0361	4	1 - Earth Road	2.0	4-Poor	4,650		
0362	4	1 - Earth Road	8.6	4-Poor	19,995		
0363	4	1 - Earth Road	1.6	3-Fair	2,760		
0363	4	5 - Bitumenous > 2"	0.1	3-Fair	461		
0364	4	1 - Earth Road	6.4	4-Poor	14,880		
0364	4	3 - Gravel Surface	6.9	4-Poor	17,078		
0364	4	4 - Bitumenous < 2"	7.1	2-Good	11,449		
0365	4	1 - Earth Road	1.7	4-Poor	3,953		
0365	4	5 - Bitumenous > 2"	2.1	4-Poor	13,230		
0366	4	1 - Earth Road	6.1	3-Fair	10,523		
0367	4	1 - Earth Road	3.1	5-Failing	9,649		
0367	4	3 - Gravel Surface	1.6	4-Poor	3,960		
0368	4	1 - Earth Road	0.2	4-Poor	465		
0368	4	4 - Bitumenous < 2"	1.9	2-Good	3,064		
0369	4	1 - Earth Road	0.2	4-Poor	465		
0500	4	4 - Bitumenous < 2"	0.1	4-Poor	398		
0501	4	4 - Bitumenous < 2"	1.5	3-Fair	4,613		
0502	4	4 - Bitumenous < 2"	0.9	3-Fair	2,768		
0502	4	5 - Bitumenous > 2"	0.4	3-Fair	1,845		
0503	4	5 - Bitumenous > 2"	0.3	3-Fair	1,384		
0504	4	4 - Bitumenous < 2"	0.7	3-Fair	2,153		
0509	4	4 - Bitumenous < 2"	3.6	5-Failing	17,955		
0510	4	4 - Bitumenous < 2"	0.2	3-Fair	615		

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N32 - Shiprock
N32780 - Navajo (Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0512	4	4 - Bitumenous < 2"	4.3	3-Fair	13,223		
0513	4	4 - Bitumenous < 2"	0.1	3-Fair	308		
0514	4	4 - Bitumenous < 2"	0.6	3-Fair	1,845		
0515	4	4 - Bitumenous < 2"	0.3	3-Fair	923		
0530	4	1 - Earth Road	0.4	3-Fair	690		
0531	4	3 - Gravel Surface	0.2	3-Fair	383		
0531	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
0545	4	1 - Earth Road	0.9	2-Good	979		
0545	4	4 - Bitumenous < 2"	0.3	2-Good	484		
0546	4	1 - Earth Road	2.5	5-Failing	7,781		
0546	4	4 - Bitumenous < 2"	1.7	3-Fair	5,228		
0547	4	1 - Earth Road	1.8	3-Fair	3,105		
0548	4	1 - Earth Road	2.2	4-Poor	5,115		
0549	4	1 - Earth Road	1.9	3-Fair	3,278		
0550	4	1 - Earth Road	1.9	4-Poor	4,418		
0551	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460		
0552	4	4 - Bitumenous < 2"	2.7	3-Fair	8,303		
0553	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
0556	4	1 - Earth Road	1.2	3-Fair	2,070		
0557	4	1 - Earth Road	1.1	3-Fair	1,898		
0558	4	1 - Earth Road	0.8	3-Fair	1,380		
0559	4	1 - Earth Road	0.6	3-Fair	1,035		
0561	4	1 - Earth Road	0.1	3-Fair	173		
0562	4	1 - Earth Road	1.5	3-Fair	2,588		
0562	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538		
0563	4	1 - Earth Road	0.6	3-Fair	1,035		
0564	4	1 - Earth Road	0.5	3-Fair	863		
0565	4	1 - Earth Road	0.3	3-Fair	518		

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0566	4	1 - Earth Road	0.3	3-Fair	518		
0569	4	3 - Gravel Surface	1.8	4-Poor	4,455		
0570	4	1 - Earth Road	0.8	4-Poor	1,860		
0571	4	1 - Earth Road	2.4	4-Poor	5,580		
0681	4	1 - Earth Road	10.0	4-Poor	23,250		
5000	4	1 - Earth Road	11.4	3-Fair	19,665		
5000	4	4 - Bitumenous < 2"	14.4	3-Fair	44,280		
5001	4	1 - Earth Road	12.4	4-Poor	28,830		
5002	4	1 - Earth Road	6.9	4-Poor	16,043		
5003	4	1 - Earth Road	1.8	4-Poor	4,185		
5004	4	1 - Earth Road	5.2	4-Poor	12,090		
5005	4	1 - Earth Road	8.8	4-Poor	20,460		
5006	4	1 - Earth Road	2.7	4-Poor	6,278		
5007	4	1 - Earth Road	14.8	4-Poor	34,410		
5007	4	9 - Primitive	10.0	4-Poor	18,000		
5008	4	1 - Earth Road	0.7	4-Poor	1,628		
5009	4	1 - Earth Road	2.2	4-Poor	5,115		
5010	4	1 - Earth Road	8.8	3-Fair	15,180		
5010	4	5 - Bitumenous > 2"	4.3	3-Fair	19,834		
5010	4	9 - Primitive	2.5	5-Failing	6,000		
5011	4	1 - Earth Road	0.4	4-Poor	930		
5012	4	1 - Earth Road	8.8	3-Fair	15,180		
5012	4	3 - Gravel Surface	5.6	3-Fair	10,710		
5013	4	1 - Earth Road	14.0	4-Poor	32,550		
5014	4	1 - Earth Road	3.7	4-Poor	8,603		
5015	4	1 - Earth Road	0.1	4-Poor	233		
5016	4	1 - Earth Road	8.6	4-Poor	19,995		
5017	4	1 - Earth Road	7.1	4-Poor	16,508		

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
5018	4	1 - Earth Road	0.1	4-Poor	233		
5018	4	4 - Bitumenous < 2"	0.2	3-Fair	615		
5019	4	1 - Earth Road	2.0	4-Poor	4,650		
5020	4	1 - Earth Road	24.7	3-Fair	42,608		
5021	4	1 - Earth Road	4.0	3-Fair	6,900		
5022	4	1 - Earth Road	2.0	4-Poor	4,650		
5023	4	1 - Earth Road	8.3	4-Poor	19,298		
5024	4	1 - Earth Road	2.2	4-Poor	5,115		
5025	4	1 - Earth Road	1.3	4-Poor	3,023		
5026	4	1 - Earth Road	4.3	5-Failing	13,384		
5027	4	1 - Earth Road	1.2	4-Poor	2,790		
5028	4	1 - Earth Road	0.8	4-Poor	1,860		
5029	4	1 - Earth Road	2.1	4-Poor	4,883		
5030	4	1 - Earth Road	13.7	4-Poor	31,853		
5031	4	1 - Earth Road	7.6	4-Poor	17,670		
5031	4	4 - Bitumenous < 2"	0.2	2-Good	323		
5034	4	1 - Earth Road	17.4	4-Poor	40,455		
5035	4	1 - Earth Road	6.0	4-Poor	13,950		
5036	4	1 - Earth Road	1.9	4-Poor	4,418		
5037	4	1 - Earth Road	7.0	3-Fair	12,075		
5038	4	1 - Earth Road	1.5	4-Poor	3,488		
5039	4	1 - Earth Road	2.9	4-Poor	6,743		
5040	4	1 - Earth Road	13.4	4-Poor	31,155		
5040	4	9 - Primitive	15.2	4-Poor	27,360		
5041	4	1 - Earth Road	0.2	4-Poor	465		
5042	4	1 - Earth Road	3.5	4-Poor	8,138		
5043	4	1 - Earth Road	9.5	4-Poor	22,088		
5045	4	1 - Earth Road	10.7	4-Poor	24,878		

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N32 - Shiprock
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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
5047	4	1 - Earth Road	8.6	4-Poor	19,995		
5048	4	1 - Earth Road	2.0	4-Poor	4,650		
5049	4	1 - Earth Road	3.6	4-Poor	8,370		
5050	4	1 - Earth Road	0.1	4-Poor	233		
5051	4	1 - Earth Road	0.6	4-Poor	1,395		
5052	4	1 - Earth Road	4.4	4-Poor	10,230		
5053	4	1 - Earth Road	3.4	4-Poor	7,905		
5054	4	1 - Earth Road	8.9	4-Poor	20,693		
5055	4	1 - Earth Road	3.2	4-Poor	7,440		
5056	4	1 - Earth Road	5.4	4-Poor	12,555		
5057	4	1 - Earth Road	4.4	4-Poor	10,230		
5058	4	1 - Earth Road	8.2	4-Poor	19,065		
5059	4	1 - Earth Road	2.9	4-Poor	6,743		
5060	4	1 - Earth Road	17.6	4-Poor	40,920		
5060	4	3 - Gravel Surface	9.1	4-Poor	22,523		
5060	4	4 - Bitumenous < 2"	3.5	4-Poor	13,913		
5061	4	1 - Earth Road	18.3	3-Fair	31,568		
5062	4	1 - Earth Road	4.1	3-Fair	7,073		
5063	4	1 - Earth Road	17.6	3-Fair	30,360		
5065	4	1 - Earth Road	7.3	3-Fair	12,593		
5066	4	1 - Earth Road	8.7	3-Fair	15,008		
5067	4	1 - Earth Road	2.5	3-Fair	4,313		
5068	4	4 - Bitumenous < 2"	3.2	3-Fair	9,840		
5068	4	5 - Bitumenous > 2"	10.6	3-Fair	48,893		
5069	4	3 - Gravel Surface	2.7	3-Fair	5,164		
5070	4	1 - Earth Road	3.0	4-Poor	6,975		
5071	4	1 - Earth Road	2.1	3-Fair	3,623		
5072	4	1 - Earth Road	4.7	4-Poor	10,928		

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N32 - Shiprock
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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
5073	4	1 - Earth Road	0.6	4-Poor	1,395		
5080	4	1 - Earth Road	13.8	4-Poor	32,085		
5080	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305		
5081	4	1 - Earth Road	21.3	3-Fair	36,743		
5082	4	1 - Earth Road	13.4	3-Fair	23,115		
5085	4	1 - Earth Road	7.3	3-Fair	12,593		
5087	4	1 - Earth Road	4.0	3-Fair	6,900		
5089	4	1 - Earth Road	7.1	3-Fair	12,248		
5090	4	1 - Earth Road	2.1	3-Fair	3,623		
5091	4	1 - Earth Road	28.2	4-Poor	65,565		
5092	4	1 - Earth Road	5.7	5-Failing	17,741		
5094	4	3 - Gravel Surface	0.3	3-Fair	574		
5099	4	3 - Gravel Surface	0.3	3-Fair	574		
5099	4	4 - Bitumenous < 2"	20.2	3-Fair	62,115		
5111	4	1 - Earth Road	7.0	4-Poor	16,275		
5112	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538		
5113	4	1 - Earth Road	11.9	4-Poor	27,668		
5114	4	5 - Bitumenous > 2"	1.6	3-Fair	7,380		
5200	4	1 - Earth Road	2.0	4-Poor	4,650		
5201	4	1 - Earth Road	1.7	4-Poor	3,953		
5203	4	1 - Earth Road	3.5	4-Poor	8,138		
5204	4	1 - Earth Road	2.5	4-Poor	5,813		
5205	4	1 - Earth Road	2.5	4-Poor	5,813		
5206	4	1 - Earth Road	3.6	4-Poor	8,370		
5289	4	1 - Earth Road	0.9	3-Fair	1,553		
8008	4	1 - Earth Road	5.5	5-Failing	17,119		
8009	4	1 - Earth Road	17.1	5-Failing	53,224		
8014	4	1 - Earth Road	2.7	3-Fair	4,658		

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N32 - Shiprock
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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
8070	4	1 - Earth Road	17.1	3-Fair	29,498		
8071	4	1 - Earth Road	4.0	3-Fair	6,900		
8081	4	1 - Earth Road	1.7	4-Poor	3,953		
		Reservation Total:	1,223.0		3,386,355		

N32796 - Navajo Off Res Lands(Shiprock)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0005	4	5 - Bitumenous > 2"	1.3	4-Poor	8,190		
0012	4	4 - Bitumenous < 2"	0.6	3-Fair	1,845		
0036	4	5 - Bitumenous > 2"	1.1	3-Fair	5,074		
0038	4	1 - Earth Road	2.0	4-Poor	4,650		
5080	4	1 - Earth Road	0.7	4-Poor	1,628		
5091	4	1 - Earth Road	0.3	4-Poor	698		
		Reservation Total:	6.0		22,084		
		Agency Total:	1,229.0		3,408,439		

N33 - Western Navajo
N33780 - Navajo (Western Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0002	4	1 - Earth Road	15.0	4-Poor	34,875	17,986	16,889
0002	4	3 - Gravel Surface	0.2	3-Fair	383	74	309
0002	4	4 - Bitumenous < 2"	20.6	4-Poor	81,885	74	81,811
0015	4	4 - Bitumenous < 2"	26.0	3-Fair	79,950	5,728	74,222
0015	4	5 - Bitumenous > 2"	10.0	3-Fair	46,125	34	46,091
0016	4	1 - Earth Road	14.8	3-Fair	25,530	0	25,530

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N33 - Western Navajo
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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0016	4	4 - Bitumenous < 2"	18.9	3-Fair	58,118	0	58,118
0016	4	5 - Bitumenous > 2"	23.0	3-Fair	106,088	1,342	104,746
0020	4	4 - Bitumenous < 2"	14.6	3-Fair	44,895	79	44,816
0020	4	5 - Bitumenous > 2"	27.5	2-Good	80,644	113	80,531
0021	4	1 - Earth Road	33.0	4-Poor	76,725	3,822	72,903
0021	4	4 - Bitumenous < 2"	7.9	2-Good	12,739	0	12,739
0021	4	5 - Bitumenous > 2"	13.5	2-Good	39,589	18,226	21,363
0023	4	1 - Earth Road	7.8	4-Poor	18,135	0	18,135
0024	4	4 - Bitumenous < 2"	4.6	3-Fair	14,145	1,301	12,844
0040	4	9 - Primitive	16.2	5-Failing	38,880	0	38,880
0042	4	1 - Earth Road	5.8	4-Poor	13,485	0	13,485
0042	4	4 - Bitumenous < 2"	14.8	4-Poor	58,830	586	58,244
0059	4	5 - Bitumenous > 2"	25.1	3-Fair	115,774	1,941	113,833
0061	4	1 - Earth Road	2.6	3-Fair	4,485	0	4,485
0061	4	3 - Gravel Surface	5.6	3-Fair	10,710	0	10,710
0061	4	4 - Bitumenous < 2"	1.4	4-Poor	5,565	0	5,565
0070	4	1 - Earth Road	15.3	3-Fair	26,393	0	26,393
0071	4	1 - Earth Road	7.9	3-Fair	13,628	4,074	9,554
0071	4	3 - Gravel Surface	4.4	4-Poor	10,890	1,701	9,189
0106	4	4 - Bitumenous < 2"	2.8	5-Failing	13,965	4,043	9,922
0118	4	1 - Earth Road	17.9	3-Fair	30,878	2,539	28,339
0128	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988	0	1,988
0151	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923
0161	4	1 - Earth Road	6.8	4-Poor	15,810	0	15,810
0162	4	3 - Gravel Surface	0.1	3-Fair	191	0	191
0162	4	5 - Bitumenous > 2"	0.7	3-Fair	3,229	0	3,229
0164	4	3 - Gravel Surface	0.1	3-Fair	191	0	191
0164	4	5 - Bitumenous > 2"	0.3	1-Excellent	377	0	377

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0201	4	1 - Earth Road	12.1	4-Poor	28,133	0	28,133
0211	4	1 - Earth Road	2.8	5-Failing	8,715	0	8,715
0212	4	1 - Earth Road	3.2	4-Poor	7,440	0	7,440
0213	4	1 - Earth Road	21.5	4-Poor	49,988	684	49,304
0214	4	1 - Earth Road	2.9	4-Poor	6,743	2,300	4,443
0215	4	1 - Earth Road	13.3	4-Poor	30,923	0	30,923
0221	4	1 - Earth Road	7.5	3-Fair	12,938	2,421	10,517
0221	4	4 - Bitumenous < 2"	4.5	2-Good	7,256	224	7,032
0221	4	5 - Bitumenous > 2"	0.7	3-Fair	3,229	0	3,229
0221	4	9 - Primitive	1.6	4-Poor	2,880	0	2,880
0222	4	5 - Bitumenous > 2"	4.5	3-Fair	20,756	0	20,756
0591	4	1 - Earth Road	16.3	4-Poor	37,898	112	37,786
0592	4	1 - Earth Road	2.8	3-Fair	4,830	30	4,800
0593	4	1 - Earth Road	3.4	4-Poor	7,905	0	7,905
0594	4	1 - Earth Road	9.4	4-Poor	21,855	75	21,780
0595	4	1 - Earth Road	3.9	3-Fair	6,728	0	6,728
0600	4	4 - Bitumenous < 2"	1.4	4-Poor	5,565	0	5,565
0601	4	4 - Bitumenous < 2"	0.1	4-Poor	398	0	398
0602	4	4 - Bitumenous < 2"	2.7	4-Poor	10,733	0	10,733
0603	4	4 - Bitumenous < 2"	0.6	3-Fair	1,845	0	1,845
0604	4	4 - Bitumenous < 2"	3.4	4-Poor	13,515	0	13,515
0606	4	5 - Bitumenous > 2"	0.2	4-Poor	1,260	0	1,260
0607	4	5 - Bitumenous > 2"	0.6	3-Fair	2,768	0	2,768
0608	4	4 - Bitumenous < 2"	0.4	4-Poor	1,590	0	1,590
0608	4	5 - Bitumenous > 2"	2.7	3-Fair	12,454	554	11,900
0609	4	1 - Earth Road	1.4	4-Poor	3,255	0	3,255
0609	4	4 - Bitumenous < 2"	0.2	4-Poor	795	0	795
0610	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193	0	1,193

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0612	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193	0	1,193
0613	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193	0	1,193
0614	4	4 - Bitumenous < 2"	1.1	4-Poor	4,373	0	4,373
0615	4	4 - Bitumenous < 2"	0.1	4-Poor	398	0	398
0616	4	4 - Bitumenous < 2"	0.8	4-Poor	3,180	0	3,180
0617	4	4 - Bitumenous < 2"	0.2	4-Poor	795	0	795
0618	4	4 - Bitumenous < 2"	0.2	4-Poor	795	0	795
0619	4	1 - Earth Road	4.3	5-Failing	13,384	0	13,384
1011	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460	0	2,460
1012	4	1 - Earth Road	6.5	4-Poor	15,113	0	15,113
1013	4	5 - Bitumenous > 2"	0.2	3-Fair	923	0	923
1015	4	4 - Bitumenous < 2"	0.8	3-Fair	2,460	578	1,882
1015	4	5 - Bitumenous > 2"	0.8	3-Fair	3,690	0	3,690
1017	4	1 - Earth Road	1.1	3-Fair	1,898	434	1,464
1017	4	4 - Bitumenous < 2"	3.7	3-Fair	11,378	0	11,378
2121	4	1 - Earth Road	2.6	5-Failing	8,093	0	8,093
5910	4	1 - Earth Road	3.8	4-Poor	8,835	0	8,835
6001	4	4 - Bitumenous < 2"	0.1	4-Poor	398	0	398
6002	4	4 - Bitumenous < 2"	0.1	4-Poor	398	0	398
6003	4	4 - Bitumenous < 2"	0.1	4-Poor	398	0	398
6011	4	1 - Earth Road	7.4	3-Fair	12,765	823	11,942
6110	4	1 - Earth Road	15.0	4-Poor	34,875	102	34,773
6120	4	1 - Earth Road	11.6	4-Poor	26,970	0	26,970
6130	4	1 - Earth Road	15.5	4-Poor	36,038	59	35,979
6131	4	1 - Earth Road	4.8	4-Poor	11,160	0	11,160
6132	4	1 - Earth Road	3.8	4-Poor	8,835	59	8,776
6133	4	1 - Earth Road	22.7	3-Fair	39,158	188	38,970
6134	4	1 - Earth Road	20.3	3-Fair	35,018	1,346	33,672

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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
6135	4	1 - Earth Road	2.8	4-Poor	6,510	1,822	4,688
6135	4	9 - Primitive	14.0	4-Poor	25,200	4,879	20,321
6140	4	1 - Earth Road	17.0	5-Failing	52,913	0	52,913
6141	4	4 - Bitumenous < 2"	0.2	4-Poor	795	0	795
6145	4	1 - Earth Road	1.3	3-Fair	2,243	0	2,243
6150	4	1 - Earth Road	21.2	4-Poor	49,290	0	49,290
6210	4	1 - Earth Road	13.0	4-Poor	30,225	0	30,225
6211	4	1 - Earth Road	8.7	4-Poor	20,228	0	20,228
6220	4	1 - Earth Road	13.8	5-Failing	42,953	398	42,555
6220	4	3 - Gravel Surface	0.3	4-Poor	743	0	743
6221	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
6222	4	1 - Earth Road	2.0	4-Poor	4,650	0	4,650
6230	4	1 - Earth Road	14.3	4-Poor	33,248	429	32,819
6231	4	1 - Earth Road	21.9	4-Poor	50,918	0	50,918
6240	4	1 - Earth Road	1.2	3-Fair	2,070	442	1,628
6250	4	1 - Earth Road	2.6	4-Poor	6,045	0	6,045
6260	4	1 - Earth Road	15.9	3-Fair	27,428	255	27,173
6261	4	1 - Earth Road	10.3	3-Fair	17,768	425	17,343
6262	4	1 - Earth Road	2.0	3-Fair	3,450	0	3,450
6270	4	1 - Earth Road	8.8	4-Poor	20,460	0	20,460
6305	4	1 - Earth Road	2.1	3-Fair	3,623	0	3,623
6305	4	9 - Primitive	2.4	4-Poor	4,320	0	4,320
6310	4	1 - Earth Road	49.0	4-Poor	113,925	1,772	112,153
6312	4	1 - Earth Road	7.1	3-Fair	12,248	881	11,367
6320	4	1 - Earth Road	12.2	4-Poor	28,365	1,548	26,817
6321	4	1 - Earth Road	4.2	3-Fair	7,245	0	7,245
6322	4	1 - Earth Road	4.6	4-Poor	10,695	0	10,695
6325	4	1 - Earth Road	22.6	4-Poor	52,545	0	52,545

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Region	Agency	Reservation
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N33 - Western Navajo
N33780 - Navajo (Western Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
6325	4	9 - Primitive	3.6	3-Fair	4,725	0	4,725
6326	4	1 - Earth Road	6.5	4-Poor	15,113	0	15,113
6329	4	1 - Earth Road	1.0	3-Fair	1,725	0	1,725
6330	4	1 - Earth Road	32.8	3-Fair	56,580	4,230	52,350
6331	4	1 - Earth Road	3.8	4-Poor	8,835	4,418	4,417
6331	4	5 - Bitumenous > 2"	1.0	4-Poor	6,300	691	5,609
6400	4	9 - Primitive	7.0	5-Failing	16,800	0	16,800
6410	4	1 - Earth Road	3.9	4-Poor	9,068	0	9,068
6410	4	4 - Bitumenous < 2"	1.7	4-Poor	6,758	0	6,758
6420	4	1 - Earth Road	11.2	4-Poor	26,040	0	26,040
6430	4	1 - Earth Road	5.7	4-Poor	13,253	0	13,253
6440	4	1 - Earth Road	20.4	3-Fair	35,190	0	35,190
6444	4	1 - Earth Road	9.2	3-Fair	15,870	0	15,870
6450	4	1 - Earth Road	19.0	4-Poor	44,175	268	43,907
6460	4	1 - Earth Road	24.3	4-Poor	56,498	1,626	54,872
6460	4	4 - Bitumenous < 2"	0.2	2-Good	323	0	323
6461	4	1 - Earth Road	2.9	3-Fair	5,003	298	4,705
6461	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923
6462	4	1 - Earth Road	3.9	4-Poor	9,068	0	9,068
6463	4	1 - Earth Road	5.5	4-Poor	12,788	199	12,589
6465	4	1 - Earth Road	9.6	4-Poor	22,320	782	21,538
6466	4	1 - Earth Road	6.3	4-Poor	14,648	0	14,648
6470	4	3 - Gravel Surface	2.0	3-Fair	3,825	0	3,825
6471	4	1 - Earth Road	3.4	3-Fair	5,865	0	5,865
6480	4	1 - Earth Road	6.2	3-Fair	10,695	0	10,695
6480	4	3 - Gravel Surface	1.0	4-Poor	2,475	0	2,475
6485	4	1 - Earth Road	4.6	3-Fair	7,935	772	7,163
6486	4	1 - Earth Road	9.3	3-Fair	16,043	1,483	14,560

Indian Reservation Roads Program
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N33 - Western Navajo
N33780 - Navajo (Western Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
6487	4	1 - Earth Road	10.8	4-Poor	25,110	1,777	23,333
6490	4	1 - Earth Road	6.8	3-Fair	11,730	1,587	10,143
6491	4	1 - Earth Road	8.0	4-Poor	18,600	360	18,240
6510	4	1 - Earth Road	12.7	3-Fair	21,908	0	21,908
6520	4	1 - Earth Road	4.4	4-Poor	10,230	75	10,155
6530	4	1 - Earth Road	2.9	3-Fair	5,003	53	4,950
6541	4	1 - Earth Road	5.7	3-Fair	9,833	65	9,768
6620	4	1 - Earth Road	6.4	4-Poor	14,880	0	14,880
6710	4	1 - Earth Road	13.0	4-Poor	30,225	0	30,225
6720	4	1 - Earth Road	18.5	3-Fair	31,913	518	31,395
6720	4	4 - Bitumenous < 2"	0.8	5-Failing	3,990	0	3,990
6730	4	1 - Earth Road	41.7	3-Fair	71,933	58	71,875
6731	4	3 - Gravel Surface	9.4	3-Fair	17,978	0	17,978
6732	4	1 - Earth Road	20.7	3-Fair	35,708	0	35,708
6733	4	1 - Earth Road	5.6	4-Poor	13,020	0	13,020
6810	4	1 - Earth Road	9.9	3-Fair	17,078	5,432	11,646
6811	4	1 - Earth Road	7.3	4-Poor	16,973	13,325	3,648
6812	4	1 - Earth Road	4.1	3-Fair	7,073	0	7,073
6820	4	1 - Earth Road	14.8	4-Poor	34,410	2,718	31,692
6822	4	1 - Earth Road	4.9	4-Poor	11,393	2,118	9,275
6830	4	1 - Earth Road	9.8	3-Fair	16,905	6,865	10,040
6910	4	1 - Earth Road	19.9	4-Poor	46,268	68	46,200
6920	4	1 - Earth Road	7.7	3-Fair	13,283	0	13,283
6921	4	1 - Earth Road	5.9	3-Fair	10,178	0	10,178
6922	4	1 - Earth Road	2.4	4-Poor	5,580	68	5,512
6923	4	1 - Earth Road	6.3	3-Fair	10,868	1,232	9,636
6930	4	1 - Earth Road	11.9	3-Fair	20,528	843	19,685
6931	4	1 - Earth Road	5.7	4-Poor	13,253	0	13,253

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Region	Agency	Reservation
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N33 - Western Navajo

N33780 - Navajo (Western Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
6932	4	1 - Earth Road	1.7	3-Fair	2,933	0	2,933
6933	4	1 - Earth Road	4.4	3-Fair	7,590	0	7,590
8071	4	1 - Earth Road	12.9	4-Poor	29,993	0	29,993
		Reservation Total:	1,401.0		3,337,562	138,432	3,199,130

N33796 - Navajo Off Res Lands(Western)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0020	4	4 - Bitumenous < 2"	1.6	4-Poor	6,360	0	6,360
6150	4	4 - Bitumenous < 2"	1.2	3-Fair	3,690	0	3,690
6910	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
6930	4	1 - Earth Road	3.4	4-Poor	7,905	0	7,905
		Reservation Total:	9.0		24,465	0	24,465

N33K80 - Navajo-Hopi Jt. Use (Western)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0002	4	5 - Bitumenous > 2"	9.3	4-Poor	58,590	0	58,590
0021	4	1 - Earth Road	2.1	5-Failing	6,536	1,331	5,205
6033	4	1 - Earth Road	8.6	5-Failing	26,768	0	26,768
6240	4	1 - Earth Road	4.2	5-Failing	13,073	0	13,073
6250	4	1 - Earth Road	7.6	5-Failing	23,655	0	23,655
6710	4	1 - Earth Road	5.1	3-Fair	8,798	0	8,798
6720	4	1 - Earth Road	20.9	3-Fair	36,053	0	36,053
6730	4	1 - Earth Road	1.7	3-Fair	2,933	0	2,933
		Reservation Total:	59.5		176,404	1,331	175,073

N33 - Western Navajo

Agency Total:	1,469.5		3,538,431	139,763	3,398,668

N34 - Eastern Navajo

N34723 - Puertocito

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0055	4	4 - Bitumenous < 2"	16.9	1-Excellent	13,309		
0055	4	5 - Bitumenous > 2"	7.9	5-Failing	66,360		
0541	4	1 - Earth Road	1.3	3-Fair	2,243		
0542	4	9 - Primitive	0.8	3-Fair	1,050		
0551	4	9 - Primitive	0.8	3-Fair	1,050		
0706	4	4 - Bitumenous < 2"	0.4	2-Good	645		
7030	4	1 - Earth Road	3.1	3-Fair	5,348		
7030	4	3 - Gravel Surface	0.6	3-Fair	1,148		
7031	4	1 - Earth Road	0.5	3-Fair	863		
7032	4	1 - Earth Road	6.3	3-Fair	10,868		
7032	4	3 - Gravel Surface	0.5	3-Fair	956		
7033	4	1 - Earth Road	1.9	3-Fair	3,278		
7034	4	3 - Gravel Surface	4.9	3-Fair	9,371		
7035	4	1 - Earth Road	4.5	3-Fair	7,763		
		Reservation Total:	50.4		124,249		

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N34 - Eastern Navajo
N34724 - To'Hajiilee

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0056	4	1 - Earth Road	6.9	3-Fair	11,903		
0056	4	4 - Bitumenous < 2"	6.9	3-Fair	21,218		
0056	4	5 - Bitumenous > 2"	1.0	3-Fair	4,613		
0057	4	1 - Earth Road	10.4	3-Fair	17,940		
0058	4	1 - Earth Road	6.4	3-Fair	11,040		
0059	4	1 - Earth Road	5.4	3-Fair	9,315		
0561	4	9 - Primitive	3.6	3-Fair	4,725		
0716	4	4 - Bitumenous < 2"	0.5	2-Good	806		
7036	4	1 - Earth Road	1.6	3-Fair	2,760		
7037	4	1 - Earth Road	2.6	3-Fair	4,485		
7038	4	1 - Earth Road	1.0	3-Fair	1,725		
7039	4	1 - Earth Road	3.6	3-Fair	6,210		
7041	4	1 - Earth Road	2.0	3-Fair	3,450		
7042	4	1 - Earth Road	4.1	3-Fair	7,073		
7071	4	1 - Earth Road	1.5	3-Fair	2,588		
7072	4	1 - Earth Road	0.5	3-Fair	863		
7073	4	1 - Earth Road	1.4	3-Fair	2,415		
7074	4	1 - Earth Road	0.8	3-Fair	1,380		
7075	4	1 - Earth Road	1.9	3-Fair	3,278		
7076	4	1 - Earth Road	4.8	3-Fair	8,280		
7077	4	1 - Earth Road	0.8	3-Fair	1,380		
		Reservation Total:	67.7		127,444		

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N34 - Eastern Navajo

N34780 - Navajo (Eastern Navajo)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0009	4	4 - Bitumenous < 2"	5.5	2-Good	8,869		
0009	4	5 - Bitumenous > 2"	5.8	2-Good	17,009		
0052	4	1 - Earth Road	2.9	3-Fair	5,003		
0052	4	4 - Bitumenous < 2"	1.5	3-Fair	4,613		
0098	4	1 - Earth Road	4.0	3-Fair	6,900		
7009	4	1 - Earth Road	3.1	3-Fair	5,348		
7021	4	1 - Earth Road	4.3	3-Fair	7,418		
7049	4	1 - Earth Road	5.1	3-Fair	8,798		
7057	4	1 - Earth Road	28.9	3-Fair	49,853		
7057	4	4 - Bitumenous < 2"	0.7	2-Good	1,129		
7060	4	1 - Earth Road	4.1	3-Fair	7,073		
7101	4	1 - Earth Road	2.7	3-Fair	4,658		
7122	4	1 - Earth Road	2.2	3-Fair	3,795		
7123	4	1 - Earth Road	1.9	3-Fair	3,278		
7124	4	1 - Earth Road	6.4	3-Fair	11,040		
7126	4	1 - Earth Road	2.7	3-Fair	4,658		
7141	4	1 - Earth Road	0.3	3-Fair	518		
9652	4	1 - Earth Road	6.0	3-Fair	10,350		
		Reservation Total:	88.1		160,304		

N34796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0009	4	4 - Bitumenous < 2"	37.9	4-Poor	150,653		
0009	4	5 - Bitumenous > 2"	29.5	4-Poor	185,850		
0011	4	1 - Earth Road	12.4	3-Fair	21,390		
0011	4	4 - Bitumenous < 2"	12.2	2-Good	19,673		
0046	4	1 - Earth Road	22.0	3-Fair	37,950		

Indian Reservation Roads Program
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Region	Agency	Reservation
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N34 - Eastern Navajo
N34796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0046	4	5 - Bitumenous > 2"	1.9	3-Fair	8,764		
0047	4	9 - Primitive	5.9	3-Fair	7,744		
0048	4	1 - Earth Road	0.3	3-Fair	518		
0048	4	4 - Bitumenous < 2"	17.4	3-Fair	53,505		
0049	4	4 - Bitumenous < 2"	0.4	3-Fair	1,230		
0049	4	5 - Bitumenous > 2"	12.0	3-Fair	55,350		
0050	4	1 - Earth Road	1.3	3-Fair	2,243		
0052	4	1 - Earth Road	2.1	3-Fair	3,623		
0091	4	1 - Earth Road	9.0	3-Fair	15,525		
0093	4	1 - Earth Road	4.8	3-Fair	8,280		
0111	4	1 - Earth Road	1.7	3-Fair	2,933		
0112	4	1 - Earth Road	0.8	3-Fair	1,380		
0471	4	1 - Earth Road	11.9	3-Fair	20,528		
0473	4	1 - Earth Road	10.0	3-Fair	17,250		
0474	4	1 - Earth Road	6.5	3-Fair	11,213		
0474	4	4 - Bitumenous < 2"	11.9	5-Failing	59,351		
0475	4	1 - Earth Road	8.9	3-Fair	15,353		
0476	4	1 - Earth Road	6.9	3-Fair	11,903		
0481	4	1 - Earth Road	18.4	3-Fair	31,740		
0482	4	1 - Earth Road	6.5	3-Fair	11,213		
0483	4	1 - Earth Road	5.1	3-Fair	8,798		
0485	4	1 - Earth Road	8.0	3-Fair	13,800		
0486	4	1 - Earth Road	3.5	3-Fair	6,038		
0488	4	1 - Earth Road	1.0	3-Fair	1,725		
0489	4	1 - Earth Road	1.6	3-Fair	2,760		
0491	4	1 - Earth Road	4.3	3-Fair	7,418		
0492	4	1 - Earth Road	2.9	3-Fair	5,003		
0493	4	1 - Earth Road	0.5	3-Fair	863		

Indian Reservation Roads Program
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Filter		
Region	Agency	Reservation
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N34 - Eastern Navajo
N34796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0701	4	4 - Bitumenous < 2"	1.2	3-Fair	3,690		
0703	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538		
0704	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538		
0705	4	4 - Bitumenous < 2"	0.9	3-Fair	2,768		
1040	4	1 - Earth Road	0.5	2-Good	544		
1040	4	4 - Bitumenous < 2"	0.7	2-Good	1,129		
1040	4	5 - Bitumenous > 2"	0.9	2-Good	2,639		
1041	4	4 - Bitumenous < 2"	0.6	2-Good	968		
1042	4	4 - Bitumenous < 2"	2.4	2-Good	3,870		
1043	4	5 - Bitumenous > 2"	0.3	2-Good	880		
1044	4	4 - Bitumenous < 2"	0.1	2-Good	161		
1045	4	4 - Bitumenous < 2"	0.6	2-Good	968		
1046	4	4 - Bitumenous < 2"	0.2	2-Good	323		
1047	4	4 - Bitumenous < 2"	0.6	2-Good	968		
1048	4	4 - Bitumenous < 2"	0.8	2-Good	1,290		
7004	4	1 - Earth Road	22.4	3-Fair	38,640		
7005	4	1 - Earth Road	1.6	3-Fair	2,760		
7008	4	1 - Earth Road	2.3	3-Fair	3,968		
7009	4	1 - Earth Road	1.1	3-Fair	1,898		
7013	4	1 - Earth Road	1.1	3-Fair	1,898		
7014	4	1 - Earth Road	2.9	3-Fair	5,003		
7017	4	1 - Earth Road	2.2	3-Fair	3,795		
7029	4	1 - Earth Road	1.0	3-Fair	1,725		
7044	4	4 - Bitumenous < 2"	3.1	5-Failing	15,461		
7046	4	4 - Bitumenous < 2"	13.2	2-Good	21,285		
7052	4	1 - Earth Road	3.7	3-Fair	6,383		
7052	4	9 - Primitive	1.3	3-Fair	1,706		
7053	4	1 - Earth Road	1.9	3-Fair	3,278		

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N34 - Eastern Navajo
N34796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
7054	4	1 - Earth Road	8.0	3-Fair	13,800		
7059	4	1 - Earth Road	7.4	3-Fair	12,765		
7062	4	4 - Bitumenous < 2"	7.5	3-Fair	23,063		
7101	4	9 - Primitive	4.6	3-Fair	6,038		
7111	4	1 - Earth Road	2.8	3-Fair	4,830		
7113	4	1 - Earth Road	8.5	3-Fair	14,663		
7114	4	1 - Earth Road	5.3	3-Fair	9,143		
7117	4	1 - Earth Road	0.8	3-Fair	1,380		
7119	4	1 - Earth Road	1.2	3-Fair	2,070		
7120	4	4 - Bitumenous < 2"	0.1	3-Fair	308		
7120	4	5 - Bitumenous > 2"	0.6	3-Fair	2,768		
7128	4	1 - Earth Road	8.4	3-Fair	14,490		
7129	4	1 - Earth Road	2.5	3-Fair	4,313		
7130	4	1 - Earth Road	1.0	3-Fair	1,725		
7131	4	9 - Primitive	0.2	3-Fair	263		
7132	4	1 - Earth Road	4.4	3-Fair	7,590		
7133	4	1 - Earth Road	4.3	3-Fair	7,418		
7134	4	1 - Earth Road	1.6	3-Fair	2,760		
7135	4	1 - Earth Road	3.0	3-Fair	5,175		
7136	4	1 - Earth Road	3.3	3-Fair	5,693		
7140	4	4 - Bitumenous < 2"	9.9	4-Poor	39,353		
7141	4	1 - Earth Road	3.1	3-Fair	5,348		
7273	4	5 - Bitumenous > 2"	0.7	2-Good	2,053		
		Reservation Total:	437.3		1,119,629		
		Agency Total:	643.5		1,531,625		

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N35 - Chinle
N35780 - Navajo (Chinle)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0004	4	1 - Earth Road	8.7	4-Poor	20,228	435	19,793
0004	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923
0004	4	5 - Bitumenous > 2"	36.8	2-Good	107,916	3,812	104,104
0007	4	1 - Earth Road	18.9	4-Poor	43,943	0	43,943
0007	4	4 - Bitumenous < 2"	11.5	3-Fair	35,363	1,349	34,014
0007	4	5 - Bitumenous > 2"	2.2	3-Fair	10,148	0	10,148
0012	4	4 - Bitumenous < 2"	38.0	4-Poor	151,050	3,432	147,618
0013	4	5 - Bitumenous > 2"	9.4	3-Fair	43,358	431	42,927
0018	4	1 - Earth Road	17.4	4-Poor	40,455	268	40,187
0025	4	1 - Earth Road	12.4	4-Poor	28,830	0	28,830
0025	4	4 - Bitumenous < 2"	2.3	4-Poor	9,143	0	9,143
0026	4	1 - Earth Road	15.6	4-Poor	36,270	0	36,270
0027	4	1 - Earth Road	9.8	4-Poor	22,785	4,433	18,352
0027	4	5 - Bitumenous > 2"	14.7	3-Fair	67,804	0	67,804
0029	4	1 - Earth Road	23.8	4-Poor	55,335	0	55,335
0029	4	4 - Bitumenous < 2"	7.0	4-Poor	27,825	0	27,825
0041	4	1 - Earth Road	7.6	4-Poor	17,670	0	17,670
0041	4	4 - Bitumenous < 2"	21.3	4-Poor	84,668	5,237	79,431
0059	4	5 - Bitumenous > 2"	20.6	4-Poor	129,780	2,873	126,907
0060	4	1 - Earth Road	1.4	4-Poor	3,255	0	3,255
0060	4	4 - Bitumenous < 2"	1.6	4-Poor	6,360	0	6,360
0061	4	1 - Earth Road	7.2	4-Poor	16,740	0	16,740
0064	4	5 - Bitumenous > 2"	24.4	3-Fair	112,545	454	112,091
0065	4	4 - Bitumenous < 2"	7.6	4-Poor	30,210	1,203	29,007
0067	4	1 - Earth Road	11.2	4-Poor	26,040	0	26,040
0067	4	5 - Bitumenous > 2"	2.0	3-Fair	9,225	0	9,225
0100	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628
0100	4	4 - Bitumenous < 2"	0.7	4-Poor	2,783	0	2,783

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N35 - Chinle
N35780 - Navajo (Chinle)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0100	4	5 - Bitumenous > 2"	0.1	3-Fair	461	0	461
0101	4	4 - Bitumenous < 2"	0.2	1-Excellent	158	0	158
0102	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	0	3,075
0104	4	4 - Bitumenous < 2"	0.2	1-Excellent	158	0	158
0105	4	4 - Bitumenous < 2"	0.4	5-Failing	1,995	0	1,995
0106	4	4 - Bitumenous < 2"	0.2	4-Poor	795	0	795
0109	4	1 - Earth Road	0.2	4-Poor	465	0	465
0109	4	4 - Bitumenous < 2"	1.5	4-Poor	5,963	0	5,963
0131	4	1 - Earth Road	3.2	4-Poor	7,440	0	7,440
0131	4	4 - Bitumenous < 2"	0.2	4-Poor	795	0	795
0132	4	1 - Earth Road	2.3	4-Poor	5,348	0	5,348
0133	4	1 - Earth Road	2.3	4-Poor	5,348	0	5,348
0133	4	4 - Bitumenous < 2"	0.4	4-Poor	1,590	0	1,590
0134	4	1 - Earth Road	2.7	4-Poor	6,278	0	6,278
0135	4	1 - Earth Road	0.9	4-Poor	2,093	0	2,093
0136	4	1 - Earth Road	2.9	4-Poor	6,743	0	6,743
0171	4	1 - Earth Road	7.4	4-Poor	17,205	1,351	15,854
0172	4	1 - Earth Road	15.7	4-Poor	36,503	4,236	32,267
0172	4	4 - Bitumenous < 2"	0.2	5-Failing	998	0	998
0203	4	4 - Bitumenous < 2"	5.6	1-Excellent	4,410	0	4,410
0251	4	1 - Earth Road	2.0	4-Poor	4,650	0	4,650
0251	4	4 - Bitumenous < 2"	29.3	5-Failing	146,134	0	146,134
0271	4	1 - Earth Road	3.2	4-Poor	7,440	0	7,440
0271	4	4 - Bitumenous < 2"	0.5	2-Good	806	0	806
0291	4	4 - Bitumenous < 2"	0.7	4-Poor	2,783	0	2,783
0302	4	1 - Earth Road	0.3	4-Poor	698	0	698
0303	4	4 - Bitumenous < 2"	0.7	4-Poor	2,783	0	2,783
0406	4	4 - Bitumenous < 2"	0.1	4-Poor	398	0	398

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N35 - Chinle
N35780 - Navajo (Chinle)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0597	4	4 - Bitumenous < 2"	0.4	4-Poor	1,590	0	1,590
0601	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193	0	1,193
0641	4	1 - Earth Road	2.7	4-Poor	6,278	0	6,278
0672	4	1 - Earth Road	5.4	4-Poor	12,555	0	12,555
0673	4	1 - Earth Road	2.2	4-Poor	5,115	928	4,187
0702	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193	0	1,193
0801	4	4 - Bitumenous < 2"	1.2	4-Poor	4,770	0	4,770
0803	4	4 - Bitumenous < 2"	0.2	4-Poor	795	0	795
0804	4	4 - Bitumenous < 2"	0.2	4-Poor	795	0	795
0806	4	4 - Bitumenous < 2"	0.1	4-Poor	398	0	398
0810	4	5 - Bitumenous > 2"	0.2	2-Good	587	0	587
8008	4	1 - Earth Road	1.4	4-Poor	3,255	0	3,255
8009	4	1 - Earth Road	5.6	4-Poor	13,020	1,286	11,734
8015	4	1 - Earth Road	13.3	4-Poor	30,923	0	30,923
8016	4	1 - Earth Road	6.3	4-Poor	14,648	0	14,648
8017	4	1 - Earth Road	4.5	4-Poor	10,463	0	10,463
8018	4	1 - Earth Road	3.8	4-Poor	8,835	0	8,835
8027	4	1 - Earth Road	15.7	4-Poor	36,503	6,679	29,824
8027	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923
8028	4	1 - Earth Road	8.7	4-Poor	20,228	1,406	18,822
8029	4	1 - Earth Road	15.6	4-Poor	36,270	222	36,048
8030	4	1 - Earth Road	25.3	4-Poor	58,823	19,909	38,914
8030	4	4 - Bitumenous < 2"	1.6	2-Good	2,580	0	2,580
8031	4	1 - Earth Road	12.1	4-Poor	28,133	1,336	26,797
8031	4	3 - Gravel Surface	0.5	4-Poor	1,238	0	1,238
8031	4	4 - Bitumenous < 2"	5.5	3-Fair	16,913	0	16,913
8032	4	1 - Earth Road	9.9	4-Poor	23,018	0	23,018
8033	4	1 - Earth Road	6.5	4-Poor	15,113	0	15,113

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N35 - Chinle
N35780 - Navajo (Chinle)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
8033	4	9 - Primitive	5.7	5-Failing	13,680	0	13,680
8034	4	1 - Earth Road	24.9	4-Poor	57,893	366	57,527
8042	4	1 - Earth Road	4.5	4-Poor	10,463	0	10,463
8043	4	1 - Earth Road	4.4	4-Poor	10,230	0	10,230
8059	4	1 - Earth Road	20.1	4-Poor	46,733	3,394	43,339
8060	4	1 - Earth Road	4.9	4-Poor	11,393	0	11,393
8061	4	1 - Earth Road	2.4	4-Poor	5,580	408	5,172
8062	4	1 - Earth Road	11.0	4-Poor	25,575	0	25,575
8063	4	1 - Earth Road	7.1	4-Poor	16,508	0	16,508
8065	4	1 - Earth Road	9.9	4-Poor	23,018	0	23,018
8066	4	1 - Earth Road	24.2	4-Poor	56,265	596	55,669
8066	4	4 - Bitumenous < 2"	2.4	3-Fair	7,380	0	7,380
8066	4	5 - Bitumenous > 2"	8.6	3-Fair	39,668	46	39,622
8067	4	1 - Earth Road	4.8	4-Poor	11,160	1,075	10,085
8068	4	1 - Earth Road	20.7	4-Poor	48,128	157	47,971
8069	4	1 - Earth Road	4.2	4-Poor	9,765	0	9,765
8072	4	1 - Earth Road	5.6	4-Poor	13,020	0	13,020
8073	4	1 - Earth Road	17.6	4-Poor	40,920	0	40,920
8074	4	1 - Earth Road	7.9	4-Poor	18,368	934	17,434
8076	4	1 - Earth Road	10.5	4-Poor	24,413	0	24,413
8077	4	1 - Earth Road	21.9	4-Poor	50,918	0	50,918
8077	4	5 - Bitumenous > 2"	8.4	3-Fair	38,745	0	38,745
8078	4	1 - Earth Road	4.1	4-Poor	9,533	0	9,533
8078	4	5 - Bitumenous > 2"	1.8	3-Fair	8,303	0	8,303
8079	4	1 - Earth Road	5.9	4-Poor	13,718	0	13,718
8080	4	3 - Gravel Surface	10.7	4-Poor	26,483	0	26,483
8081	4	1 - Earth Road	1.7	4-Poor	3,953	0	3,953
8082	4	1 - Earth Road	9.1	4-Poor	21,158	1,548	19,610

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N35 - Chinle
N35780 - Navajo (Chinle)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
8083	4	1 - Earth Road	10.4	4-Poor	24,180	1,385	22,795
8084	4	1 - Earth Road	21.3	4-Poor	49,523	0	49,523
8085	4	1 - Earth Road	4.9	4-Poor	11,393	0	11,393
8086	4	1 - Earth Road	17.6	4-Poor	40,920	0	40,920
8087	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
8088	4	1 - Earth Road	11.3	4-Poor	26,273	0	26,273
8089	4	1 - Earth Road	10.2	4-Poor	23,715	0	23,715
8090	4	1 - Earth Road	33.3	4-Poor	77,423	3,967	73,456
8091	4	1 - Earth Road	1.5	4-Poor	3,488	0	3,488
8092	4	1 - Earth Road	1.1	4-Poor	2,558	0	2,558
8094	4	1 - Earth Road	9.4	4-Poor	21,855	0	21,855
8094	4	5 - Bitumenous > 2"	2.2	3-Fair	10,148	366	9,782
8095	4	1 - Earth Road	3.8	3-Fair	6,555	128	6,427
		Reservation Total:	964.1		2,739,428	75,650	2,663,778

N35K80 - Navajo-Hopi Jt. Use

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0004	4	1 - Earth Road	10.5	4-Poor	24,413	0	24,413
0041	4	3 - Gravel Surface	4.5	4-Poor	11,138	0	11,138
0060	4	4 - Bitumenous < 2"	2.1	3-Fair	6,458	0	6,458
0061	4	1 - Earth Road	1.4	3-Fair	2,415	0	2,415
0065	4	1 - Earth Road	2.7	3-Fair	4,658	0	4,658
8027	4	1 - Earth Road	16.6	4-Poor	38,595	0	38,595
8029	4	1 - Earth Road	3.7	4-Poor	8,603	0	8,603
8031	4	1 - Earth Road	5.0	4-Poor	11,625	0	11,625
8060	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628
8062	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790

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N35 - Chinle
N35K80 - Navajo-Hopi Jt. Use

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
8074	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628
		Reservation Total:	49.1		113,948	0	113,948
		Agency Total:	1,013.2		2,853,375	75,650	2,777,725

N36 - Fort Defiance
N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0006	4	4 - Bitumenous < 2"	36.3	3-Fair	111,623	1,000	110,623
0007	4	1 - Earth Road	5.5	4-Poor	12,788	500	12,288
0007	4	4 - Bitumenous < 2"	15.9	3-Fair	48,893	5,000	43,893
0009	4	5 - Bitumenous > 2"	20.0	2-Good	58,650	4,000	54,650
0012	4	4 - Bitumenous < 2"	21.9	3-Fair	67,343	2,000	65,343
0012	4	5 - Bitumenous > 2"	36.1	3-Fair	166,511	12,000	154,511
0015	4	4 - Bitumenous < 2"	67.4	3-Fair	207,255	6,000	201,255
0025	4	1 - Earth Road	9.5	4-Poor	22,088	0	22,088
0026	4	1 - Earth Road	9.3	4-Poor	21,623	400	21,223
0027	4	4 - Bitumenous < 2"	4.5	3-Fair	13,838	500	13,338
0027	4	5 - Bitumenous > 2"	8.2	3-Fair	37,823	400	37,423
0028	4	1 - Earth Road	45.6	4-Poor	106,020	500	105,520
0028	4	4 - Bitumenous < 2"	0.1	5-Failing	499	0	499
0030	4	1 - Earth Road	29.8	4-Poor	69,285	1,000	68,285
0030	4	4 - Bitumenous < 2"	2.8	3-Fair	8,610	0	8,610
0031	4	1 - Earth Road	10.5	4-Poor	24,413	400	24,013
0031	4	5 - Bitumenous > 2"	3.0	2-Good	8,798	0	8,798
0037	4	1 - Earth Road	7.3	4-Poor	16,973	200	16,773
0039	4	1 - Earth Road	0.7	4-Poor	1,628	500	1,128

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N36 - Fort Defiance
N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0039	4	5 - Bitumenous > 2"	1.4	2-Good	4,106	0	4,106
0054	4	4 - Bitumenous < 2"	0.6	2-Good	968	300	668
0054	4	5 - Bitumenous > 2"	9.9	3-Fair	45,664	1,000	44,664
0060	4	4 - Bitumenous < 2"	25.1	4-Poor	99,773	1,200	98,573
0069	4	1 - Earth Road	12.1	4-Poor	28,133	0	28,133
0096	4	1 - Earth Road	12.3	4-Poor	28,598	0	28,598
0100	4	4 - Bitumenous < 2"	2.3	3-Fair	7,073	200	6,873
0108	4	1 - Earth Road	0.2	4-Poor	465	0	465
0108	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988	0	1,988
0110	4	1 - Earth Road	0.1	4-Poor	233	0	233
0110	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	4,500	0
0110	4	5 - Bitumenous > 2"	0.1	3-Fair	461	1,500	0
0111	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
0112	4	1 - Earth Road	11.9	4-Poor	27,668	400	27,268
0112	4	4 - Bitumenous < 2"	7.8	4-Poor	31,005	0	31,005
0113	4	1 - Earth Road	0.5	4-Poor	1,163	0	1,163
0113	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193	0	1,193
0123	4	1 - Earth Road	2.5	4-Poor	5,813	0	5,813
0123	4	3 - Gravel Surface	0.6	3-Fair	1,148	0	1,148
0124	4	1 - Earth Road	10.6	4-Poor	24,645	0	24,645
0125	4	1 - Earth Road	4.6	4-Poor	10,695	0	10,695
0126	4	9 - Primitive	11.7	5-Failing	28,080	0	28,080
0130	4	4 - Bitumenous < 2"	3.0	3-Fair	9,225	0	9,225
0131	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628
0132	4	4 - Bitumenous < 2"	0.6	3-Fair	1,845	0	1,845
0135	4	1 - Earth Road	0.3	4-Poor	698	0	698
0136	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
0137	4	4 - Bitumenous < 2"	1.5	3-Fair	4,613		

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N36 - Fort Defiance
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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0138	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075	0	3,075
0151	4	1 - Earth Road	4.2	4-Poor	9,765	0	9,765
0151	4	4 - Bitumenous < 2"	1.1	3-Fair	3,383	0	3,383
0152	4	1 - Earth Road	1.5	4-Poor	3,488	0	3,488
0153	4	1 - Earth Road	15.5	4-Poor	36,038	400	35,638
0153	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988	0	1,988
0154	4	1 - Earth Road	5.8	4-Poor	13,485	300	13,185
0155	4	1 - Earth Road	8.5	4-Poor	19,763	0	19,763
0156	4	1 - Earth Road	1.3	4-Poor	3,023	0	3,023
0157	4	1 - Earth Road	23.4	4-Poor	54,405	0	54,405
0157	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988	0	1,988
0203	4	1 - Earth Road	34.6	4-Poor	80,445	1,500	78,945
0203	4	3 - Gravel Surface	1.0	4-Poor	2,475	0	2,475
0321	4	1 - Earth Road	16.7	4-Poor	38,828	1,000	37,828
0321	4	4 - Bitumenous < 2"	0.2	5-Failing	998	400	598
0372	4	1 - Earth Road	2.4	4-Poor	5,580	0	5,580
0391	4	4 - Bitumenous < 2"	0.5	2-Good	806	0	806
0541	4	1 - Earth Road	0.3	4-Poor	698	0	698
0542	4	4 - Bitumenous < 2"	0.3	3-Fair	923	0	923
0543	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193	0	1,193
0544	4	4 - Bitumenous < 2"	0.4	4-Poor	1,590	0	1,590
0601	4	1 - Earth Road	3.9	4-Poor	9,068	0	9,068
0602	4	4 - Bitumenous < 2"	2.6	4-Poor	10,335	1,000	9,335
0603	4	1 - Earth Road	7.7	4-Poor	17,903	0	17,903
0691	4	1 - Earth Road	5.2	4-Poor	12,090	0	12,090
0692	4	1 - Earth Road	2.0	4-Poor	4,650	0	4,650
0693	4	1 - Earth Road	3.9	4-Poor	9,068	0	9,068
0693	4	4 - Bitumenous < 2"	0.5	2-Good	806	0	806

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N36 - Fort Defiance
N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0694	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
1370	4	4 - Bitumenous < 2"	0.6	3-Fair	1,845	0	1,845
9000	4	1 - Earth Road	7.7	4-Poor	17,903	500	17,403
9001	4	1 - Earth Road	13.1	4-Poor	30,458	500	29,958
9001	4	4 - Bitumenous < 2"	0.7	3-Fair	2,153	0	2,153
9002	4	1 - Earth Road	9.6	4-Poor	22,320	1,000	21,320
9003	4	1 - Earth Road	29.1	4-Poor	67,658	600	67,058
9004	4	1 - Earth Road	3.5	4-Poor	8,138	0	8,138
9005	4	1 - Earth Road	4.0	4-Poor	9,300	0	9,300
9010	4	1 - Earth Road	34.5	4-Poor	80,213	1,000	79,213
9010	4	4 - Bitumenous < 2"	11.9	1-Excellent	9,371	0	9,371
9011	4	1 - Earth Road	8.6	4-Poor	19,995	0	19,995
9012	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
9014	4	1 - Earth Road	3.3	4-Poor	7,673	0	7,673
9031	4	1 - Earth Road	15.1	4-Poor	35,108	300	34,808
9031	4	4 - Bitumenous < 2"	2.8	5-Failing	13,965	0	13,965
9051	4	1 - Earth Road	8.6	4-Poor	19,995	200	19,795
9052	4	1 - Earth Road	11.1	4-Poor	25,808	200	25,608
9053	4	1 - Earth Road	7.0	4-Poor	16,275	700	15,575
9054	4	1 - Earth Road	5.6	4-Poor	13,020	600	12,420
9055	4	1 - Earth Road	9.5	4-Poor	22,088	0	22,088
9056	4	1 - Earth Road	4.0	4-Poor	9,300	1,000	8,300
9057	4	1 - Earth Road	12.5	4-Poor	29,063	0	29,063
9061	4	1 - Earth Road	4.0	4-Poor	9,300	0	9,300
9062	4	1 - Earth Road	11.1	4-Poor	25,808	0	25,808
9065	4	1 - Earth Road	19.4	4-Poor	45,105	0	45,105
9066	4	1 - Earth Road	3.1	4-Poor	7,208	0	7,208
9067	4	1 - Earth Road	1.3	4-Poor	3,023	0	3,023

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N36 - Fort Defiance
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Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
9068	4	1 - Earth Road	6.0	4-Poor	13,950	0	13,950
9069	4	1 - Earth Road	1.7	4-Poor	3,953	0	3,953
9073	4	1 - Earth Road	2.0	4-Poor	4,650	500	4,150
9101	4	1 - Earth Road	9.4	4-Poor	21,855	600	21,255
9101	4	5 - Bitumenous > 2"	1.3	3-Fair	5,996	0	5,996
9102	4	1 - Earth Road	7.6	3-Fair	13,110	600	12,510
9103	4	1 - Earth Road	3.1	4-Poor	7,208	1,500	5,708
9155	4	1 - Earth Road	7.3	4-Poor	16,973	0	16,973
9157	4	1 - Earth Road	3.0	4-Poor	6,975	0	6,975
9201	4	1 - Earth Road	5.8	4-Poor	13,485	400	13,085
9202	4	1 - Earth Road	1.0	4-Poor	2,325	0	2,325
9202	4	4 - Bitumenous < 2"	1.3	3-Fair	3,998	0	3,998
9205	4	1 - Earth Road	3.9	4-Poor	9,068	0	9,068
9252	4	1 - Earth Road	1.6	4-Poor	3,720	0	3,720
9304	4	1 - Earth Road	6.7	4-Poor	15,578	0	15,578
9310	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628
9311	4	1 - Earth Road	1.6	4-Poor	3,720	0	3,720
9345	4	4 - Bitumenous < 2"	2.7	2-Good	4,354	2,000	2,354
9352	4	1 - Earth Road	5.8	4-Poor	13,485	0	13,485
9353	4	1 - Earth Road	3.4	4-Poor	7,905	0	7,905
9355	4	1 - Earth Road	14.6	4-Poor	33,945	0	33,945
9401	4	1 - Earth Road	10.7	4-Poor	24,878	0	24,878
9402	4	1 - Earth Road	19.6	4-Poor	45,570	1,000	44,570
9402	4	3 - Gravel Surface	0.6	3-Fair	1,148	0	1,148
9402	4	4 - Bitumenous < 2"	0.4	4-Poor	1,590	400	1,190
9404	4	1 - Earth Road	9.4	4-Poor	21,855	0	21,855
9405	4	1 - Earth Road	6.7	4-Poor	15,578	0	15,578
9406	4	1 - Earth Road	5.0	4-Poor	11,625	0	11,625

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Filter		
Region	Agency	Reservation
N		

N36 - Fort Defiance
N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
9408	4	1 - Earth Road	3.2	4-Poor	7,440	0	7,440
9410	4	1 - Earth Road	9.9	5-Failing	30,814	0	30,814
9411	4	1 - Earth Road	4.3	4-Poor	9,998	0	9,998
9450	4	1 - Earth Road	0.7	5-Failing	2,179	0	2,179
9451	4	1 - Earth Road	1.2	5-Failing	3,735	0	3,735
9452	4	1 - Earth Road	1.9	4-Poor	4,418	0	4,418
9501	4	1 - Earth Road	9.5	4-Poor	22,088	0	22,088
9502	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
9503	4	1 - Earth Road	3.1	4-Poor	7,208	0	7,208
9504	4	1 - Earth Road	4.6	4-Poor	10,695	0	10,695
9551	4	1 - Earth Road	2.6	4-Poor	6,045	0	6,045
9603	4	1 - Earth Road	1.6	4-Poor	3,720	0	3,720
9604	4	1 - Earth Road	5.6	4-Poor	13,020	0	13,020
9606	4	1 - Earth Road	13.8	4-Poor	32,085	500	31,585
9652	4	1 - Earth Road	17.3	4-Poor	40,223	500	39,723
9653	4	1 - Earth Road	10.3	4-Poor	23,948	500	23,448
9654	4	1 - Earth Road	3.1	4-Poor	7,208	400	6,808
9655	4	1 - Earth Road	9.1	4-Poor	21,158	400	20,758
9658	4	1 - Earth Road	12.3	4-Poor	28,598	0	28,598
9659	4	1 - Earth Road	7.1	4-Poor	16,508	500	16,008
9660	4	1 - Earth Road	6.3	4-Poor	14,648	800	13,848
9702	4	1 - Earth Road	14.7	4-Poor	34,178	0	34,178
9703	4	1 - Earth Road	15.0	4-Poor	34,875	500	34,375
9751	4	1 - Earth Road	0.7	4-Poor	1,628	0	1,628
9752	4	1 - Earth Road	9.4	4-Poor	21,855	0	21,855
9753	4	1 - Earth Road	3.5	4-Poor	8,138	0	8,138
9753	4	9 - Primitive	3.0	5-Failing	7,200	0	7,200
9754	4	1 - Earth Road	3.7	4-Poor	8,603	0	8,603

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Filter		
Region	Agency	Reservation
N		

N36 - Fort Defiance
N36780 - Navajo (Ft. Defiance)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
9760	4	1 - Earth Road	3.8	4-Poor	8,835	0	8,835
9801	4	1 - Earth Road	2.7	4-Poor	6,278	0	6,278
9803	4	1 - Earth Road	3.7	3-Fair	6,383	0	6,383
9806	4	1 - Earth Road	8.5	4-Poor	19,763	0	19,763
9811	4	1 - Earth Road	7.3	4-Poor	16,973	0	16,973
9813	4	1 - Earth Road	5.5	4-Poor	12,788	0	12,788
9840	4	1 - Earth Road	5.0	4-Poor	11,625	0	11,625
9841	4	1 - Earth Road	3.0	4-Poor	6,975	0	6,975
9843	4	1 - Earth Road	5.4	4-Poor	12,555	0	12,555
9844	4	1 - Earth Road	8.2	4-Poor	19,065	0	19,065
9845	4	1 - Earth Road	4.0	4-Poor	9,300	0	9,300
9846	4	1 - Earth Road	5.0	4-Poor	11,625	0	11,625
9854	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
9855	4	1 - Earth Road	2.4	4-Poor	5,580	0	5,580
9857	4	1 - Earth Road	12.0	4-Poor	27,900	0	27,900
9858	4	1 - Earth Road	7.5	4-Poor	17,438	0	17,438
9859	4	1 - Earth Road	2.2	4-Poor	5,115	0	5,115
9860	4	1 - Earth Road	21.3	4-Poor	49,523	0	49,523
9863	4	1 - Earth Road	1.4	4-Poor	3,255	0	3,255
9864	4	1 - Earth Road	6.6	4-Poor	15,345	0	15,345
9901	4	1 - Earth Road	10.0	4-Poor	23,250	500	22,750
		Reservation Total:	1,298.6		3,337,177	66,300	3,265,653

N36 - Fort Defiance
N36796 - Navajo Off Res Lands

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0054	4	5 - Bitumenous > 2"	1.0	3-Fair	4,613	0	4,613
9402	4	1 - Earth Road	2.8	4-Poor	6,510	0	6,510
9405	4	3 - Gravel Surface	0.8	4-Poor	1,980	0	1,980
		Reservation Total:	4.6		13,103	0	13,103

N36K80 - Navajo-Hopi Jt. Use

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0006	4	4 - Bitumenous < 2"	4.4	3-Fair	13,530	0	13,530
9000	4	1 - Earth Road	1.3	4-Poor	3,023	0	3,023
9062	4	1 - Earth Road	10.1	4-Poor	23,483	0	23,483
9101	4	1 - Earth Road	5.6	4-Poor	13,020	0	13,020
9102	4	1 - Earth Road	0.6	4-Poor	1,395	0	1,395
9751	4	1 - Earth Road	7.0	4-Poor	16,275	0	16,275
9759	4	1 - Earth Road	1.2	4-Poor	2,790	0	2,790
		Reservation Total:	30.2		73,515	0	73,515
		Agency Total:	1,333.4		3,423,794	66,300	3,352,271

N48 - Niip
N48780 - Navajo (Niip)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
0101	4	1 - Earth Road	0.5	4-Poor	1,163		
3003	4	4 - Bitumenous < 2"	2.1	3-Fair	6,458		
3003	4	5 - Bitumenous > 2"	6.0	3-Fair	27,675	2,326	25,349
3005	4	4 - Bitumenous < 2"	13.9	3-Fair	42,743		
4050	4	4 - Bitumenous < 2"	6.3	3-Fair	19,373	174	19,199

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Filter		
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N48 - Niip
N48780 - Navajo (Niip)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
4055	4	4 - Bitumenous < 2"	9.8	3-Fair	30,135	1,005	29,130
4055	4	5 - Bitumenous > 2"	1.1	3-Fair	5,074		
4056	4	4 - Bitumenous < 2"	1.5	4-Poor	5,963		
4057	4	4 - Bitumenous < 2"	0.9	4-Poor	3,578		
4059	4	4 - Bitumenous < 2"	3.5	4-Poor	13,913		
4061	4	4 - Bitumenous < 2"	0.4	2-Good	645		
4062	4	4 - Bitumenous < 2"	4.3	3-Fair	13,223		
4062	4	5 - Bitumenous > 2"	1.7	3-Fair	7,841		
4063	4	4 - Bitumenous < 2"	3.9	3-Fair	11,993		
4064	4	4 - Bitumenous < 2"	0.5	3-Fair	1,538		
4065	4	4 - Bitumenous < 2"	15.3	3-Fair	47,048	3,483	43,565
4066	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
4067	4	4 - Bitumenous < 2"	5.7	3-Fair	17,528	588	16,940
4068	4	4 - Bitumenous < 2"	0.3	3-Fair	923		
4069	4	4 - Bitumenous < 2"	0.1	5-Failing	499		
4070	4	4 - Bitumenous < 2"	1.1	3-Fair	3,383		
4072	4	4 - Bitumenous < 2"	1.2	3-Fair	3,690		
4073	4	4 - Bitumenous < 2"	2.0	3-Fair	6,150		
4077	4	4 - Bitumenous < 2"	3.8	4-Poor	15,105		
4078	4	5 - Bitumenous > 2"	0.8	5-Failing	6,720		
4080	4	4 - Bitumenous < 2"	0.6	4-Poor	2,385		
4081	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988		
4082	4	4 - Bitumenous < 2"	0.2	5-Failing	998		
4083	4	4 - Bitumenous < 2"	0.3	4-Poor	1,193		
4085	4	4 - Bitumenous < 2"	1.4	3-Fair	4,305		
4087	4	4 - Bitumenous < 2"	3.5	3-Fair	10,763		
4093	4	4 - Bitumenous < 2"	8.7	3-Fair	26,753		
4095	4	4 - Bitumenous < 2"	5.1	3-Fair	15,683		

Indian Reservation Roads Program
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Filter		
Region	Agency	Reservation
N		

N48 - Niip

N48780 - Navajo (Niip)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
4103	4	4 - Bitumenous < 2"	1.3	5-Failing	6,484		
4104	4	4 - Bitumenous < 2"	2.0	4-Poor	7,950		
4109	4	4 - Bitumenous < 2"	0.4	5-Failing	1,995		
4111	4	4 - Bitumenous < 2"	2.5	5-Failing	12,469		
4150	4	5 - Bitumenous > 2"	4.9	3-Fair	22,601	502	22,099
4154	4	5 - Bitumenous > 2"	4.1	3-Fair	18,911		
4155	4	5 - Bitumenous > 2"	1.8	3-Fair	8,303		
4164	4	5 - Bitumenous > 2"	1.4	3-Fair	6,458	251	6,207
		Reservation Total:	126.4		444,664	8,329	162,487

N48796 - Navajo Off Res Lands (Niip)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
3002	4	4 - Bitumenous < 2"	9.7	2-Good	15,641		
3003	4	4 - Bitumenous < 2"	9.3	4-Poor	36,968		
3003	4	5 - Bitumenous > 2"	7.3	3-Fair	33,671		
4001	4	4 - Bitumenous < 2"	0.5	4-Poor	1,988		
4002	4	4 - Bitumenous < 2"	8.2	3-Fair	25,215		
4003	4	4 - Bitumenous < 2"	1.9	4-Poor	7,553		
4005	4	4 - Bitumenous < 2"	2.0	3-Fair	6,150		
4006	4	4 - Bitumenous < 2"	3.1	3-Fair	9,533		
4007	4	4 - Bitumenous < 2"	4.4	5-Failing	21,945		
4011	4	4 - Bitumenous < 2"	1.8	3-Fair	5,535		
4014	4	4 - Bitumenous < 2"	4.4	5-Failing	21,945		
4017	4	4 - Bitumenous < 2"	9.7	5-Failing	48,379		
4018	4	4 - Bitumenous < 2"	0.7	3-Fair	2,153		
4022	4	4 - Bitumenous < 2"	7.4	2-Good	11,933		
4028	4	4 - Bitumenous < 2"	3.6	3-Fair	11,070		

Indian Reservation Roads Program
Deferred Maintenance Assessment for Roads
Fiscal Year 2018 / Quarter 4

Filter		
Region	Agency	Reservation
N		

N48 - Niip
N48796 - Navajo Off Res Lands (Niip)

Route Number	Qtr	Surface Type Code	Length (mi)	Level Of Service Code	Maintenance Need ($)	Maintenance Performed ($)	Maintenance Deferred ($)
4030	4	4 - Bitumenous < 2"	0.8	4-Poor	3,180		
4035	4	4 - Bitumenous < 2"	8.7	2-Good	14,029		
4040	4	4 - Bitumenous < 2"	2.6	3-Fair	7,995		
4043	4	4 - Bitumenous < 2"	4.6	4-Poor	18,285		
4045	4	4 - Bitumenous < 2"	2.2	4-Poor	8,745		
4047	4	4 - Bitumenous < 2"	9.5	4-Poor	37,763		
4049	4	4 - Bitumenous < 2"	4.2	3-Fair	12,915		
4060	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
4100	4	4 - Bitumenous < 2"	1.3	2-Good	2,096		
4101	4	4 - Bitumenous < 2"	1.3	2-Good	2,096		
4121	4	4 - Bitumenous < 2"	4.8	4-Poor	19,080		
4123	4	4 - Bitumenous < 2"	3.3	4-Poor	13,118		
4140	4	4 - Bitumenous < 2"	2.1	3-Fair	6,458		
4142	4	4 - Bitumenous < 2"	1.5	3-Fair	4,613		
4145	4	5 - Bitumenous > 2"	2.3	2-Good	6,745		
4146	4	4 - Bitumenous < 2"	1.0	3-Fair	3,075		
4146	4	5 - Bitumenous > 2"	2.0	3-Fair	9,225		
4156	4	5 - Bitumenous > 2"	1.1	3-Fair	5,074		
4178	4	5 - Bitumenous > 2"	7.2	2-Good	21,114		
		Reservation Total:	135.5		458,355		
		Agency Total:	261.9		903,019	8,329	162,487
		Region Total:	6,039.1		15,923,999	299,967	9,874,471

Report Total (filtered):	6,039.1	15,923,999	299,967	9,874,471

APPENDIX C

January 9, 2018 Interview with Tom Kratochvil (NMDOT District 3 Maintenance Engineer) on the NMDOT Pavement Management procedures/details.

- Do you have a formal document for your pavement management program?
  - We have downloaded the New Mexico Department of Transportation's Pavement Maintenance Manual – 2007 edition
  - Is this document still used by the NMDOT?
    - *It is still a reference, but there is a new document that the NMDOT uses now. It is refered to as a MMS Manual (formerly HMMS).*
    - ***Tom K. will provide DDM with an electronic copy of the file.***

- What data do you collect?
  - *Old method of data collection consisted of sending out the construction crew staff during the winter and evaluating the pavement within the district. They would collect pavement data on a 1/10th segment for each mile of roadway.*
  - *Talk with Jeff Mann at NMDOT Pavement Design about their recent conversion to using GPR vans. The data collection technology was purchased from Mandli.* ***DDM to set up meeting.***

- Do you have any preferred methods of maintenance? Or any you don't like?
  - *Fog Seal, Crack Seal, Overlay, Mill and Fill*
  - *Microsurfacing is not a good application to use as just an overlay. You can use it for rutting and leveling areas, but it should have an overlay. Never use as an overlay/topcoat.*

- Do you like to follow a specific pavement life cycle for specific maintenance activities?
  - *Pavement maintenance cycles are dependent on the road location (weather and traffic type/movements). There are areas of the state that have extreme weather cycle patterns that will increase the pavement deterioration rate. One noted to be near I-40 at the Continental Divide (referred to as The Top of the World).*
  - *3-5 years: Fog seal the pavement. This cycle can be repeated if no other issues present themselves.*
    - *The timeframe for the initial application depends on the original mix design (low <5% oil content = 2-3 years, higher oil content 6% = 3-5 years).*
    - *Fog seals don't work as well with OGFC as it slowly fills the voids and prevents the capability of OGFC to shed water.*
  - *> 5 years: Crack seal (when cracking starts to appear).*
    - *Don't let the cracks get too big as you will need to spend more effort in getting them filled. May have to route them.*
  - *7-8 years (approximately 2 years after the crack seal): Thin overlay.*
    - *This can be a new OGFC layer or Novachip. Novachip is not a good application if there are wide cracks present.*
  - *10-15 years: Mill and inlay.*
    - *The milling depth should leave at least 1½" - 2" of asphalt material behind so as not to damage it.*
    - *If you have a thin asphalt section, then you make have to mill a small amount and overlay with a thicker section, which in turn raises the*

profile of your roadway. Doing this can have negative impacts to your pavement taper, guardrail/CWB installations, culverts and bridge clearances.
        - *If you don't have enough material and have to take it all off, then you will have to reshape and compact the subgrade before placing the new asphalt back on.*
    - *Full depth in-place (hot/cold) reclamation options are out there if the pavement section or deterioration does not allow for mill and inlay.*
        - *HIR: This process requires an overlay or chip seal once it's done.*
        - *Cutler: This is a one-shot process that does not require a follow-up application. More preferable.*

- Do you use any specific software?
    - *Talk with Jeff Mann at NMDOT Pavement Design about their pavement management software. It has been fairly accurate in predicting the need for future projects.* ***DDM to set up meeting.***

- Is there a good database out there to develop rough costs for budgeting maintenance activities?
    - *NMDOT uses price agreements to complete their maintenance work. Tom K. provided the location on the NMDOT website for them.*
    - *Tom K. uses a rough budget amount of $130k per lane-mile for a 2 ½" thick mill and fill.*

- Other topics discussed:
    - *When placing asphalt (new or overlay), it is always better to require the contractor to place multiple lifts (2 – 1½" lifts are better than 1 - 3" lift). Each additional lift of asphalt allows the contractor to level out rough areas from the subgrade and provide a smoother riding surface.*
    - *Funding splits: NMDOT understands the need to spread out the maintenance funding equally, but a straight split does not always work out. They tried a funding split idea where two regions got a minimum 1/3 split of funding. The remaining 1/3 split was placed in the middle for the two regions to compete for it. Significantly regional projects and/or project readiness were factors in getting the final 1/3 funding amount.*

January 22, 2018 Interview with Jeff Mann, Shawn Romero and Phillip Montoya (NMDOT Pavement Section) on the NMDOT Pavement Management procedures/details.

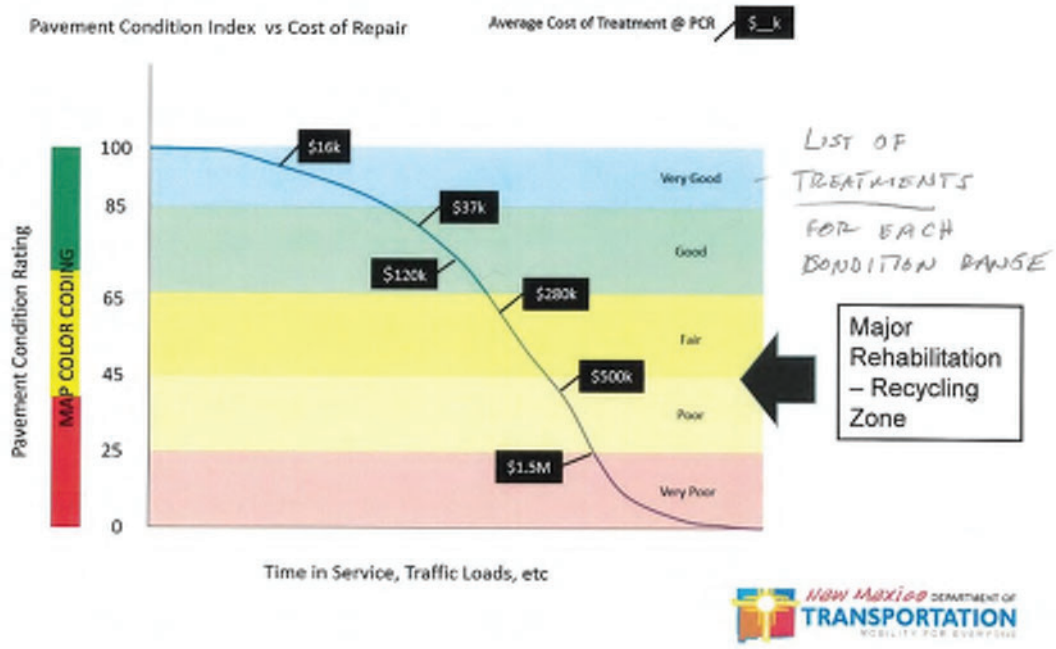
- Do you have a formal document for your pavement management program?
  - *NMDOT is regulated by FHWA's 23 CFR requirements.*
  - *NMDOT has created a PMS Engineering Configuration Manual that follows the FHWA's Distress Identification Manual (FHWA-HRT-13-092) dated May 2014.*
    - ***Jeff asked that Wilson & Company submit an IPRA request to get a copy of the NMDOT's pavement manual.***
  - *Jeff and Shawn pulled out several hard copy publications that they suggested for reference documents.*
    - *FHWA Distress Identification Manual 13092 May 2014*
    - *FHWA Guidelines for the Preservation of High-Traffic-Volume Roadways 14487 2011*
    - *FHWA Reformulated Pavement Remaining Services Life Framework Manual 13038 Nov 2013*
    - *NCHRP 501 - Pavement Management Systems - Putting Data to Work*
    - *Selecting a Preventative Maintenance Treatment for Flexible Pavements by Hicks/Seeds*

- What data do you collect?
  - *Old method of data collection consisted of using the NM State and UNM summer interns to collect data. They would collect pavement data on a 1/10th segment for each mile of roadway.*
  - *NMDOT started a database in 2012 for the pavement data.*
  - *In 2013, NMDOT started collecting pavement data electronically using consultants.*
    - *15,000 lane-miles/year*
      - *They only collect the right lane on multi-lane roadways*
      - *All the NHS / year*
      - *½ of the non-NHS /year*
    - *Rough cost to complete this effort is $85 - $90 / lane mile*

- Do you use any specific software?
  - *The NMDOT started using Agile Assets software platform in 2013.*
  - *https://www.agileassets.com/*

- Other topics discussed:
  - *Jeff indicated that a pavement evaluation number of 50 or lower may warrant subsurface investigation before applying any specific mitigation for pavement maintenance.*
  - *They provided a graphic display of a Recycling Project Type Selection Guide (see next page).*

Recycling Project Type Selection Guide



APPENDIX D

November 02, 2017 Interview with BJ Gottlieb (City of Rio Rancho's City Engineer) was interviewed on 11/02/17 in regards to the City's pavement management system.

BJ developed the City's program back in 2008 and has been managing it since then. He is extremely knowledgeable in the overall process and the MicroPaver (also known as Paver) software in which they use.

- Do you have a formal document for your pavement management program?
  - Yes, it is a brief document (6 pages) that helps explain the program to the elected officials. It also provides background on how projects are selected.
  - ***BJ provided Wilson & Company with an electronic copy.***
- What data do you collect?
  - The first time they collected data, it took 3 staff together one year to complete 450 miles of pavement evaluation.
  - The evaluations are now split up into the council districts (6 total) and there are 2 staff that will complete updated pavement evaluations (one district per year) from May to September on a part-time basis (one 4-hour day per week).
- Do you have any preferred methods of maintenance?
  - Not really. I like them all as long as they are applied correctly.
  - The best approach is to have a 5-year cycle of improvements on a section of roadway (understanding that funding may limit this).
- Did the CORR research options before buying the software you use?
  - Yes, the MicroPaver software was selected because of the low subscription cost and the stable network from which it was developed. The US Army Corp of Engineers will always be around to provide software updates, answer questions and provide training.
  - Scott McDonald with Farnsworth in Pueblo, CO serves as technical support for MicroPaver.
- Is the MicroPaver software user-friendly?
  - Yes
  - There are two books that can be purchased for the MicroPaver software. The Field Inspector book explains the data collection very well.
  - ***DDM Note: I was able to find an electronic version of the Paver 7.0 User Manual on the internet.***
- What kind of outputs does it allow?
  - Tables and graphs. These are good for the engineers, but they need to be massaged to show the public and/or politicians.
  - Results for sections of road may need to be evaluated if they have differing conditions. Program will try to apply one type of improvement for the whole section.
  - The output can also be imported into GIS. You just have to make sure that the MicroPaver sections match up to the GIS layers that you are wanting to import.
  - He believes that the latest version (7.0) of the software now has an easier transition to GIS.
- MicroPaver issues?
  - The results need to be massaged based on political influences and sections of roadway. Program does not understand that the money needs to be distributed as equally as possible among the political boundaries.
  - MicroPaver does not understand surface seals and will not recognize them. The results need to be manipulated as a result of this.

Pavement Preservation Program (P^3)

for the
City of Rio Rancho

Submitted by:
Department of Public Works – Engineering Division

February 27, 2017

I. Background & History

Traditionally, a “worst-first” approach hasbeen applied to pavement maintenance. Referred to as reactive maintenance, this philosophy prescribes to repairing roads once significant structural damage has already been incurred. The end result necessitates more severe rehabilitation projects that are expensive, cause significant traffic delays, and provide for unsafe road conditions before repairs can be completed. The City of Rio Rancho, however, will implement a proactive solution going forward to maintaining roads – the Pavement Preservation Program (P^3). The National Center for Pavement Prevention defines pavement preservation as “a cost-effective set of practices that extend pavement life and improve safety and motorist satisfaction while saving public tax dollars.” Essentially, the P^3 seeks to create a system of implementing relatively small scale repairs on roads before structural degradation to prolong the necessity of full blown road reconstruction. In short, the City of Rio Rancho will add additional maintenance cycles, in order to postpone or avoid more expensive capital projects. Successful pavement preservation will result in long term savings, reduced traffic congestion, and safer roads. Postponing maintenance on roadways leads to a “too little, too late” situation; once the structural integrity of a road is compromised, requiring more expensive reactive maintenance.

Successful Pavement Prevention Programs require dedicated funding which is essential to ensuring proactive measures. Data collection and management is also crucial and it provides a quantifiable means of assessing roadways and the preservation program as a whole. Successful pavement preservation programs need to be efficient and effective and employ the right treatment on the right pavement at the right time for each road. In short, maintenance to prolong road life must be executed with careful timing.

The Department of Public Works' Engineering Division began implementing the P^3 in 2008. The origination of this program started with a single pavement inspection for each paved road within the City limits during that year. Each subsequent year, one Council District is re-inspected and the data collected is entered into the MicroPaver database. Once entered, this data is then used to extrapolate distress information and future condition.

II. Purpose and Assumptions

The purpose of this plan is to establish guidelines for the City of Rio Rancho’s Pavement Preservation Program. The implementation of this Program is contingent upon a dedicated source. 70% of fund savings, each fiscal year, will be reprogrammed for P^3, established in Governing Body Resolution R50 passed on June 22, 2016. Depending on the timing of application, the nature of the road distress, and the type of activity, certain activities may be classified as pavement preservation or reconstruction.

The Department of Public Works' Streets & Right-of-Way Division (SROW), working in concert with the Engineering Division on pavement preservation, will concentrate on significantly smaller scale

projects, focusing primarily on a road's surface rather than subsurface structure. Larger capital projects, will be developed by the Engineering Division, i.e. roads that have structural degradation that require partial or full blown road reconstruction. These roads with structural degradation will continue to be bid and any appurtenant work (e.g. crack sealing or patching) tied to that project will be part of that bid.

Concurrent with fund savings, the City will utilize voter approved General Obligation (GO) Bonds on a two year cycle to fund more costly capital road reconstruction projects. A predictable GO Bond cycle is essential for road reconstruction.

Existing maintenance budgets will continue using current funding sources and will implement pavement preservation maintenance strategies. Public Works has purchased, and will purchase additional, equipment principally for crack sealing and patching and eventually for surface sealing equipment. SROW in-house staff will use this equipment to complete surface repairs and surface sealing work. These techniques prolong the life of road ways by addressing surface imperfections before they are allowed to deteriorate the subsurface structure of the road. It should be noted that the SROW maintenance budget will increase every year to account for increased asphalt road repair materials and equipment maintenance.

III. Definitions

Crack Sealing: This is a stopgap measure to prolong pavement life by minimizing water infiltration into the base course or subgrade. Crack sealing may be used on all asphalt pavements and only in cracks that are **less than or equal to two inches wide**. Crack sealing should be finished before Preventative Maintenance is completed.

Crack Patching: This is a stopgap measure to prolong pavement life by minimizing water infiltration into the base course or subgrade. Crack patching is another routine maintenance activity which consists of placing bituminous material into "non-working" cracks to substantially reduce water infiltration and reinforce adjacent top-down cracks. Crack patching may be used on all asphalt pavements and in cracks that are **greater than two inches wide**. Crack patching should be finished before Preventative Maintenance is completed.

Pavement Distress: Degradation of the roadway over time due to usage, environmental factors, and sometimes construction issues. Some of the more commonly seen distresses are: Fatigue or Alligator Cracking, Longitudinal or Transverse Cracking, Weathering of the asphalt surface, etc.

Pavement Preservation (Maintenance): This is a system whereby agencies use limited capital resources to ensure the quality of their roadways are maintained. This can be accomplished by using three subcategories: Preventative Maintenance, Rehabilitation, and Reconstruction.

Preventative Maintenance (PM): AASHTO, defines that as "a planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserve the system, retards

future deterioration, and maintains or improves the functional condition of the system." This is a system that keeps good roads good, by using cost effective maintenance treatments. These treatments provide a better quality riding surface and lock in valuable oil content that retards future failure to extend the life of pavements. A few examples of preventative maintenance treatments are slurry seal, microsurface, cape seal, etc. This should not be confused with an overlay, rehabilitation, or a reconstruction.

Rehabilitation: This is a structural process that helps extend the life of the pavement and restores measurable pavement conditions. It is the process of removing distressed parts of the asphalt (milling), repairing any distresses that go beyond the milling limits, and overlaying or inlaying with a new asphalt mix. This is not a reconstruction, nor a new road, but may be considered repaving. Many cities and states around the country utilize this technique when preventative maintenance is no longer effective on the asphalt surface.

Reconstruction: This is the ending result of all pavements. Once the distresses of a road are such that Preventative Maintenance or a Rehabilitation are no longer an option, this should be completed. The process is to remove all asphaltic material and base course (if present) and rework the subgrade. Once the subgrade is reworked, the structural section (base course and asphalt) is then rebuilt. This effectively becomes a new road within the existing location.

Road Classification: A hierarchical or priority system for classifying roadways based on volumes, speed, etc. The highest priority roadways within a typical city are arterials. Arterial roads carry the most traffic volume and engineers are concerned about throughput at intersections (traffic signal timing) and access management. Some example of these roads in Rio Rancho are: Southern Blvd, Northern Blvd, Unser Blvd, High Resort Blvd, etc. The next level in the classification system are collectors. Collectors carry less traffic than an arterial, but are more widespread. Their role is to move traffic from residential or local roads to arterial roadways. Examples of these roads in Rio Rancho are: Western Hills Dr, Lisbon Ave, Riverside Dr, etc. Finally, the lowest level with very little restrictions are residential roads. These are the roads where most citizens live.

Routine Maintenance: Consists of work that is planned and performed on a routine basis to maintain and preserve the condition of the roadway system or to respond to specific conditions and events that restore the roadway system to an adequate level of service.

During routine maintenance, day-to-day activities are scheduled by SROW and Engineering Division - Traffic personnel to maintain and preserve the condition of the roadways system at a satisfactory level of service. Examples of pavement-related routine maintenance activities include cleaning of roadside ditches and structures and maintenance of pavement markings. Routine Maintenance activities are often "in-house" performed and are not eligible for Federal-aid funding.

Surface Seals: This is a generic term used to describe various different types of surfacre treatments used to rejuvenate and seal the surface of an asphalt roadway. It consists of applications of asphalt

emulsion sprayed on the existing pavements surface. . Most often, these are used on open graded pavements with a weathered surface. These surface seals are used to renew oxidized asphalt surfaces that have become dry and brittle. Surface seals include fog, slurry, microsurfacing, etc.

IV. Project Selection

After assessments are completed; Pavement Condition Indices (PCIs) are calculated; and coordination with the Utilities Department and Streets & Right-of-Way Division has concluded, road maintenance projects will be determined using the following strategy:

1. Roads rating in the upper zone of the PCI scale, i.e. Good, Satisfactory, or Fair, will be evaluated for Preventative Maintenance.
2. Roads rating in the middle zone of the PCI scale, i.e. Poor and Very Poor, will be evaluated for Rehabilitation.
3. Roads rating in the lower zone of the PCI scale, i.e. Serious and Failed, will be evaluated for Reconstruction.

Though the above strategy is a best practice for evaluating road work, it is not a one size fits all. For example, a road rating in the Fair category would, based on best practices, be slated for Preventative Maintenance; however, after a review of the distresses, it may make more economical sense to conduct a Rehabilitation. This could be because the roadway is starting to see structural deterioration and without more robust construction could start to fail earlier than anticipated. In summary, it is important to note that these are ideal goals whereby there may be times where these guidelines may have to be adjusted. The overall goal of this plan is to ensure that all roads are maintained at acceptable levels throughout the City.

Once the roadways are selected, the Engineering and Streets & Right-of-Way Divisions will work together to develop a plan for implementing the appropriate treatments.

V. Project Implementation

Once projects are selected, they will be divided into two categories:

1. Contracted Procurement
2. In-house Maintenance

The projects considered for contracted procurement are ones that fall under the Rehabilitation and Reconstruction work types and require a set of plans. The Engineering Division will collect distress data, design plans, create specifications, and will work with the Purchasing Division to

contract for construction activities. Once a contractor has been awarded the project, Engineering Division staff, including inspectors, will oversee all aspects of the construction and will close out the project following required close out procedures.

In-house maintenance projects will follow a similar process, except that formal plans will not be developed and work will be completed with internal Streets & Right-of-Way Division personnel working in concert with the Engineering Division. The process to complete construction of in-house maintenance projects is as follows:

After the projects have been selected and approved by City Administration, an Engineering Division Project Manager will be selected and teamed with the Streets & Right-of-Way Division's Asphalt Supervisor. Shortly thereafter, a walkthrough of each of the project locations will be scheduled in order to take note of the number and types of distresses present on the roadway. Once the walkthrough is completed, the Engineering Division's Project Manager will prepare exhibits providing general locations of the distresses found and the quantities of materials needed to complete the projects. This information will then be sent to the Streets & Right-of-Way Division's Asphalt Supervisor for verification. If the information provided is satisfactory, the Public Works' staff members will schedule the maintenance activities to begin. During the construction of the improvements, both the Project Manager and Asphalt Supervisor will work together to ensure successful completion of the projects. This includes ensuring construction specifications are followed, testing is completed, and proper traffic control is installed. When the projects are complete, both the Project Manager and the Asphalt Supervisor will work together to finalize the close out package which will be submitted to the Engineering Division's Records & GIS Section for archiving.

VI. Public Awareness and Expectations

Throughout the projects, Public Awareness needs to be a high priority. The Engineering Division, Streets & Right-of-Way Division, Administration, and the Governing Body will all have very important roles in providing citizens with information regarding expectations of proposed work. It is important to realize that maintenance work being performed will enhance the quality of distressed (damaged) pavements, but is not a complete repair for all underlying problems. Some of the benefits of road maintenance include, but are not limited to, the following:

- Extends the functional and useful life of the road,
- Improves the rideability of the road (the apparent smoothness of the road while driving),
- Improves driveability of the road (skid resistance),
- Reduces the possibility of road failure,
- Significantly reduces the size of large longitudinal and transverse cracks (**cracks are not completely eliminated and much smaller cracks will start to reappear over time**

APPENDIX E

Meeting Minutes

From: Wilson & Company

To: Meeting Attendees

Date: January 8, 2018

Subject: **Navajo Nation Division of Transportation Engineering On-Call PMSP Kickoff Meeting – December 12-13, 2017**

File No: 14-100-040-24

List of Attendees: *See attached sign in sheets*

NDOT PMSP Kickoff Meetings were held at the NDOT offices in Window Rock, AZ on December 12-13, 2017 (see attached Agenda). Darryl Bradley was unable to attend the 12/13 meeting, so a separate meeting with him was held on 12/12.

The following items were discussed:

12/12 Meeting Notes

Why do a PMSP?

- Darryl indicated that this was a #1 priority of the NDOT LRTP – Maintain the system.
- Once a list of maintenance projects is identified, NDOT will need to get RDC approval of them.
- It will be easier for NDOT to create their own maintenance program than relying on the BIA to come up with one.

What kind of funding ($$$) will NDOT be able to commit to doing this work?

- What color of money ($$$) will be used? TTP, BIA, FET?
- Darryl would like to see an overall cost summary of the needs identified.

What does the BIA and/or the NMDOT currently do?

- **DDM to interview these agencies to understand their current process.**

Darryl does NOT feel as if the NDOT Planning Department is going to be able to provide this data or manage the PMSP.

Will the NDOT Roads Department want to self perform the maintenance work (similar to BIA)?

- **DDM to ask Joe Peterman if this is the case.**

How are the NDOT and BIA maintenance programs going to work together, since the BIA funding is dedicated to them?

- Will NDOT be providing the BIA direction on how to spend the BIA funding?

12/13 Meeting Notes

Garret's thoughts on the PMSP

- NDOT already adopted the BIA standards and methods of maintenance activity.
- The public continues to ask NDOT how they approach the selections of projects, the PMSP will provide that explanation for paved road maintenance.
    - Garret would like the public's input on priorities and then apply the pavement management system to further prioritize projects. Garret would also like to include ADT, accidents, commerce impact, specifications, etc. in the prioritization process.
- The PMSP should be closely tied to the LRTP priorities.
- The PMSP should contain the NDOT preferred maintenance strategies listed in the LRTP.
- Each Agency should have a priority route listing.
- Would like to utilize the BIA's DMR data as a good starting point.
- The PMSP should provide an overall plan that NDOT and BIA use for their maintenance projects/funding priorities.
- Wants the project listing to be data driven, but the funds should be distributed equally to each agency.

DDM question - How will the future BIA maintenance project coordination be completed?

- NDOT will need to provide BIA with general direction on projects to complete.
- BIA will need to be reporting back to NDOT on when projects are completed.
- Herby Larsen indicated that the BIA process will run as normal, no changes anticipated.

DDM reviewed the results (see Agenda) of his interview with the City Engineer (BJ Gotlieb) for the City of Rio Rancho concerning their PMSP and how he came about selecting the software package he uses.

DDM question – When you spread out the funding to each agency equally, it may be difficult to generate enough $$$s to produce meaningful maintenance projects. Would it be possible to spread out the funding $$$s over a longer period of time (5-10 years) to get it to balance out at the agency level? Yes

Summary of current roadway system network.

	TOTAL MILES	PAVED	DIRT
BIA	6,000	1,500	4,500
NDOT	5,000	112	4,888

BIA's current maintenance program

- BIA uses $6.1M per year of DOI-TPA funding to perform maintenance on their 6,000 miles of roadway.
- Garret indicated he had a DRAFT PMP that was created by Karen's Planning Department in February 2016 for BIA review. Garret inquired as if Herby had seen it.
    - **DDM requested a copy of this DRAFT from NDOT.**
- Herby indicated that a large portion of this funding is used for requests to blade/grade dirt roads. There is a small amount related to addressing emergency weather conditions. Not a lot of funding is left for paved road maintenance.
- In order to get a total cost of BIA $$$s spent on maintaining paved roadways, you need to add up the $$$s listed on all 4 quarterly DMR reports. Roadway segments listed as *5 - Bitumenous > 2"* for the Surface Type Code.

- DMR costs include all costs to bring a road to a level service 2. Pavement may be a major component, but there are also bridges, culverts, shoulders, etc. The pavement cost may actually be a smaller amount of the overall DMR report costs.
- **Herby to provide DDM with the DMR reports for quarters 1-3.** The 4th quarter report was already provided back on 11/16/17.

Budget $$$s to work with for the FY 2019 TTP projects

- NDOT's TTP annual funding = $55M
- According to CFR 25, Subpart G, Section 170.800(a), a Tribe can use 25% of its TTP funds for maintenance.
  - TTP funding = $55M
  - 25% of $55M = $13.75M
    - It should be noted that the CFR does not include road sealing in this limitation.
  - NDOT Roads Dept. current annual funding = $5.5M (per Edith)
  - Remainder of funding available for maintenance activities = $13.75M - $5.5M = $8.25M
- FY 2019 budget $$$s for NDOT PMSP projects
  - NDOT TTP funding = $8.25M available
  - BIA DOI funding = (total of the FY2017 DMR reports, quarters 1-4) – to be determined
  - FET funding = $0 - not to be used on paved routes, only dirt road priority projects
  - Final amount depends on the DMR amounts from the BIA. Looking at roughly $9M annually for the total budget amount.
    - It should be noted that some pavement preservation activities may, or may not, be eligible under FHWA's definition of maintenance.
    - The DMR budgets may include other maintenance amounts outside of just pavement.

RIFDS and collecting pavement rating data

- The BIA RIFDS program uses a pavement rating system called Surface Condition Index (SCI) which is formally known as a PCI value. The SCI rating value range is 0 – 100.
  - Field 18 per the 2004 version of the coding guide.
  - Field 24 per the 2007 DRAFT version of the coding guide.
- Virgil Henderson, NDOT Planning was in attendance and is one of the staff responsible for determining and inputting the SCI data for NDOT in his assigned area.
  - Virgil indicated that SCI and PCI are the same values.
  - **Virgil will provide Jeff Swan with the SCI rating criteria.**
  - He also indicated that it would normally take him a day to complete a roadway corridor for their normal RIFDS update.
- DDM questioned the group in regards to collecting additional SCI data on each roadway corridor so the PMSP would have better data to rely on.
  - The current RIFDS data is limited to one evaluation per segment.
  - Additional sample data would allow the PMSP evaluation to be more accurate in its recommendations and possibly allow for applying different maintenance strategies in the same corridor (depending on the needs of the area).
  - Possible solutions would involve paying a contractor to collect data or having NDOT staff collect the data themselves.
    - For the CORR, it took 3 staff approximately one year to complete 450 miles of pavement evaluation. Using the same number of staff and rate, it would take

NDOT at least 3 years to complete their evaluations this way (or one year if none staff were used).
    - Do the NDOT Planning staff have the resources/time to collect additional pavement data as they collect RIFDS updates?
    - Potential solution would be for NDOT interns to collect data during the summer (this is what NMDOT does).
    - Joe Peterman indicated that Roads staff could help collect data when they have slowdowns in maintenance/construction activity in the fall/winter months.

PMSP software discussion

- Based on a previously completed software evaluation (included in Agenda) by the Illinois Center for Transportation, Wilson & Company is recommending that NDOT consider using the MicroPAVER (PAVER) software to evaluate their pavement data and provide recommendations.
    - The software is developed by the US Army Corp of Engineers and it uses the PCI/SCI data that NDOT already collects.
    - The software is rather inexpensive being approximately $1,000 per year.
    - **Karen Benally to provide DDM with a contact person regarding their US ACOE MOA.**
    - **DDM to contact the PAVER website to determine if a DEMO version is available.**
- NDOT has already purchased another program (Pubworks) that has potential for evaluating the pavement data and providing recommendations as well.
    - The software evaluation table indicates that Pubworks would require an additional module to complete the assessment. The software does not have the capability of analyzing different maintenance and/or budget scenarios.
    - **Evans Benallie to provide DDM with the Pubworks software contact – Completed 12/21**
    - **DDM to contact Pubworks to determine cost of additional module and clarify the pavement data used.**

Next Meeting

- Wilson & Company will schedule a follow-up meeting after completing a DRAFT version of the PMSP for NDOT/BIA/FHWA review and comment.

NAVAJO NATION DIVISION OF TRANSPORTATION - Sign-In Sheet

Pavement Management System Plan Meeting

December 13, 2017

Name	Initial	Company	Phone Number	Email
Garret Silversmith	GS	Navajo DOT	928-674-5176	gsilversmith@navajodot.org
Arlando Teller		Navajo DOT	505-371-8320	ateller@navajodot.org
Darryl Bradley	DB	Navajo DOT	505-371-8397	dbradley@navajodot.org
Taft Blackhorse		Navajo DOT	505-371-8394	tblackhorse@navajodot.org
Joe Peterman	SC /	Navajo DOT	602-478-6330	jpeterman@navajodot.org
Carl Slater		Navajo DOT	505-371-8395	cslater@navajodot.org
Karen Benally	KB	Navajo DOT	505-371-8389	kbenally@navajodot.org
Norma Bowman		Navajo DOT	505-371-8391	nbowman@navajodot.org
Jonah Begay		Navajo DOT	505-371-8300	jbegay@navajodot.org
Velma Sangster		Navajo DOT	505-371-8361	vsangster@navajodot.org
Herby Larsen	HL	BIA-NRDOT	505-863-8281	herby.larsen@bia.gov
Lonnie Hammer		BIA-NRDOT	505-863-8250	lonnie.hammer@bia.gov
Derek Meier	DDM	Wilson & Company	505-348-4013	derek.meier@wilsonco.com
Jeff Swan	JS	Woodson Engineering and Surveying	928-853-2794	jswan@woodsoneng.com
Tim Wolfe	TW	Dibble Engineering	480-298-4808	tim.wolfe@dibblecorp.com

NAVAJO NATION DIVISION OF TRANSPORTATION - Sign-In Sheet

Pavement Management System Plan Meeting

December 13, 2017

Name	Initial	Company	Phone Number	Email
Evans Benallie	EB	Navajo DOT	505 371 8303	ebenallie@navajodot.org
Virgil Henderson	VH	Navajo DOT	928-283-7148	vhenderson@navajodot.org

Navajo DOT Meeting Agenda

Meeting Info:

- **Kickoff Mtg. w/ NDOT & BIA**
- **December 13, 2017**
- **9:00 am – 4:00 pm**
- **Room TBD**

Location:

Navajo DOT Complex Building
#16 Old Coal Mine Road
Mentmore, NM, 87319
(505) 371-8300

Purpose:

Establish NDOT purpose and need for PMSP

Agenda:

I. Introductions and opening remarks

- Sign in Sheet (Please Update)

II. Business

Questions for NDOT

- What does NDOT want to accomplish in completing the PSMP?
  - FHWA and/or RDC direction?
  - CFR requirements?
  - Need to establish a brief Purpose and Need statement
- Are there any more program requirements other than what is listed below?
  - CFR Title 23 Section 973.204 to 973.208
  - CFR Title 25 Section 170.800 to 170.805
- What's being used at the moment?
- Do we utilize RIFDS system data that is currently being collected? Or should we supplement the data?
- Does NDOT want to address asset management of other inventory items as part of this process?
- What maintenance standards do we want to follow?
  - BIA IAM?
  - AASHTO Maintenance Manual for Roadways and Bridges, 4th Edition
    - Wilson & Company ordered an electronic version of this for reference.
  - ADOT or NMDOT Maintenance Manuals

Steps to complete a PMSP (Review Fig. 1 from Illinois TLPA Guide)

- Defining the network
- Collection condition data (current and future)
- Predicting pavement condition
- Selecting treatments
- Reporting results
- Select a pavement management tool

Navajo DOT Meeting Agenda

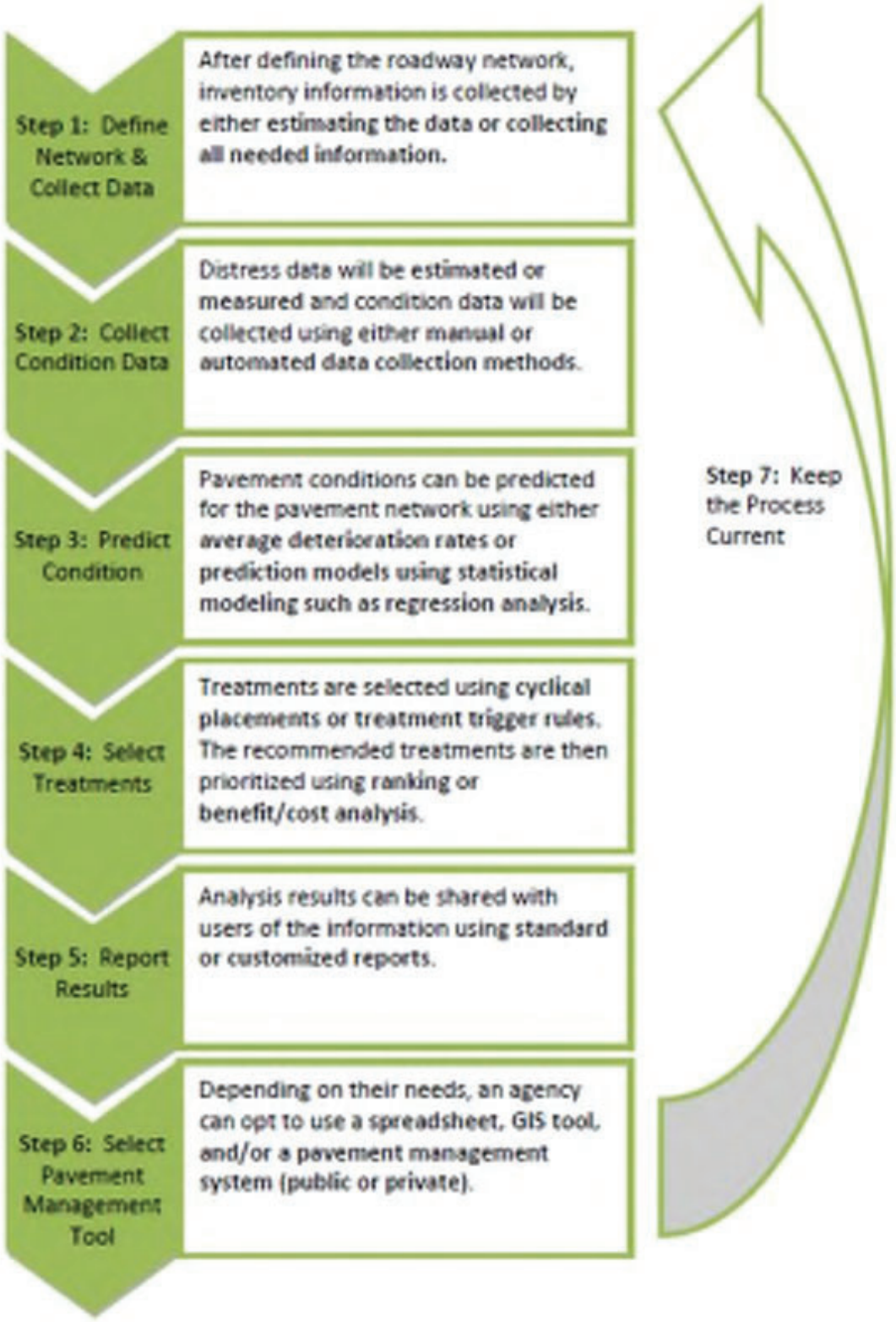


Figure 1. Pavement management process design steps.

BIA Background

- What information/data does BIA use?
  - Herby provided Wilson & Company with the 2017 4th Quarter DMR files.
  - On the DMR, is the 4th Quarter Report provided considered a cumulative summary for the year? Or is it strictly showing work completed in the 4th quarter?
  - Is there an excel file or database file that can be provided for the DMR?
  - Can you briefly explain the process in which the BIA calculates costs and then applies it to the DMR.
- Has the BIA ever utilized a software? Or is all work done using spreadsheets?
- Is there a current process to follow?

Feedback from City of Rio Rancho

BJ Gottlieb (City of Rio Rancho's City Engineer) was interviewed on 11/02/17 in regards to the City's pavement management system. BJ developed the City's program back in 2008 and has been managing it since then. He is extremely knowledgeable in the overall process and the MicroPaver (also known as Paver) software in which they use.

- Do you have a formal document for your pavement management program?
  - Yes, it is a brief document (6 pages) that helps explain the program to the elected officials. It also provides background on how projects are selected.
  - ***BJ provided Wilson & Company with an electronic copy.***
- What data do you collect?
  - The first time they collected data, it took 3 staff together one year to complete 450 miles of pavement evaluation.
  - The evaluations are now split up into the council districts (6 total) and there are 2 staff that will complete updated pavement evaluations (one district per year) from May to September on a part-time basis (one 4-hour day per week).
- Do you have any preferred methods of maintenance?
  - Not really. I like them all as long as they are applied correctly.
  - The best approach is to have a 5-year cycle of improvements on a section of roadway (understanding that funding may limit this).
- Did the CORR research options before buying the software you use?
  - Yes, the MicroPaver software was selected because of the low subscription cost and the stable network from which it was developed. The US Army Corp of Engineers will always be around to provide software updates, answer questions and provide training.
  - Scott McDonald with Farnsworth in Pueblo, CO serves as technical support for MicroPaver.
- Is the MicroPaver software user-friendly?
  - Yes
  - There are two books that can be purchased for the MicroPaver software. The Field Inspector book explains the data collection very well.
  - ***DDM Note: I was able to find an electronic version of the Paver 7.0 User Manual on the internet.***
- What kind of outputs does it allow?
  - Tables and graphs. These are good for the engineers, but they need to be massaged to show the public and/or politicians.

- Results for sections of road may need to be evaluated if they have differing conditions. Program will try to apply one type of improvement for the whole section.
- The output can also be imported into GIS. You just have to make sure that the MicroPaver sections match up to the GIS layers that you are wanting to import.
- He believes that the latest version (7.0) of the software now has an easier transition to GIS.

- MicroPaver issues?
  - The results need to be massaged based on political influences and sections of roadway. Program does not understand that the money needs to be distributed as equally as possible among the political boundaries.
  - MicroPaver does not understand surface seals and will not recognize them. The results need to be manipulated as a result of this.

Software

- NDOT currently owns PubWorks, does your version of the software have Pavement Assessment module?
- We want to be able to use current RIFDs data to start the PMSP out.
  - Potential for expanded data collection efforts in the future.
- Other software options:
  - MicroPaver from US ACOE – **DDM current recommendation**
  - Pavement Health Track Analysis Tool from FHWA
    - Any feedback from Kevin or Russell on use?
  - Utah Local Assistance Program – TAMS
  - Review Table 4 from Illinois Center for Transportation Guide

NDOT PMSP Outline – review and comment

- Table of Contents
- Executive Summary
- Chapter 1 – Introduction and Program
  - Background
  - Program Requirements
  - Data Available
  - Types of Maintenance Treatments
  - Costs for Maintenance
- Chapter 2 – Development of PMSP
  - Steps to complete
    - Defining the network
    - Collection condition data (current and future)
    - Predicting pavement condition
    - Selecting treatments
    - Reporting results
    - Select a pavement management tool
  - Public Input and Awareness
  - NDOT Asset Management plan
- Chapter 3 – Current Fiscal Year (FY) PMSP
  - Pavement maintenance priorities
  - Recommendations for implementation
  - Current FY cost breakdowns

III. Action Items

Table 2. Comparison of Pavement Management Software Features[1].

CRITERION DESCRIPTION	PAVEMENT MANAGEMENT SOFTWARE PROGRAMS							
	PUBLIC				PRIVATE			
	MicroPAVER	RoadSoft GIS	Utah LTAP TAMS	StreetSaver	RoadCare	PAVEMENTView Plus	PubWorks	PavePro Manager
Vendor	U.S. Army Corps of Engineers	Michigan Technological University - Center for Technology & Training	Utah Local Technical Assistance Program	Metropolitan Transportation Commission	Applied Research Associates	Cartegraph	Tracker Software Corporation	Infrastructure Management Services
Website	www.pavia.net	www.roadsoft.org	www.utahltap.org	www.mtcpms.org	www.ara.com	www.cartegraph.com	www.pubworks.com	www.ims-inf.com
Laptop Data Collection	Yes	Yes	Yes	Additional program needed	*	Yes	Yes	*
Ability to Analyze Other Assets	No	Yes, signs, pavement markings, traffic counts, & traffic crashes	Yes	Yes, sidewalks, lights, sign, curb and gutter, & user-defined	*	Yes, sewer, signal, sign, storm, bridge, & lights	Yes, bridges, signs, culverts, guardrails, parks, & buildings	*
Default Pavement Condition Rating Measure	PCI	PASER	RSL	PCI	PCI, IRI	OCI	PASER	*
Analyzes Different Maintenance Strategies	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Analyzes Different Budget Scenarios	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
GASB 34 Reporting	No	Yes	No	Yes	*	Yes	Yes	*
GIS Integration	Yes	Yes	Additional Software needed	Additional Software needed	Additional Software needed	Additional Module-GIS director or open software	Addition module MapViewer needed	Additional software needed
Customization Capabilities	Yes	Only certain aspects	Yes	Yes	*	*	Additional modules available	Additional modules available
Cost (2011)	APWA members $995; non-members $1195	Contact vendor for more information	Utah-Free/Out of state $500	$1500+, contact vendor for more information	Varies, contact vendor	Varies, contact vendor	Varies, contact vendor	Varies, contact vendor
User's Manual	Yes	Yes	Yes	Yes	*	Yes	Yes	*
Technical Assistance	Training courses or four-part web-based training	Telephone or web-based training	Free Telephone or paid on-site arrangements	4-day training class twice per year and customized on-site training	*	On-site or web-based training; technical support by phone	Formal training at 1 day per module, free updates, software helpdesk	*

[1] PCI – Pavement Condition Index; PASER – Pavement Surface Evaluation and Rating System; RSL – Remaining Service Life; IRI – International Roughness Index; OCI – Overall Condition Index

(*) Denotes: Unable to obtain information at this time. Contact vendor for more information.

NAVAJO D.O.T.

January 16, 2018 web meeting with Bill Jackson and Pete Anzalone on the NDOT's use of Pubworks software.

Others in attendance:

- **Virgil Henderson – NDOT**
- **Herby Larsen – BIA**
- **Derek Meier - Wilson & Company**
- **Jim Townsend – Wilson & Company**
- **Matthew Meyers – Wilson & Company**
- **Jeff Swan – Woodson**

- Pubworks has been around for approximately 20 years and is primarily known for being an asset management software program.
    - NDOT has owned/used the software for approximately 10-12 years. It is currently being used by the Roads Department to assist them in documenting their maintenance work.
- The software has a Quality Assessment function for pavement that follows the PASER methodology of assessing asphalt roadways, which is what the NDOT Planning Department is currently using to complete their RIFDs updates.
    - This allows for an easy transition of the data already being collected.
- The software allows for custom attributes to be added to the roadway links/sections.
- The software also contains a depreciation tab for the monetary value of the assets in the inventory.
    - This feature is not as useful for pavement as it is for purchased equipment.
- Pubworks does NOT have features for projecting the pavement aging cycle, incorporating standard mitigations or working with monetary/budgeting situations to determine which projects can be completed in upcoming fiscal years.

- It was determined that Pubworks would not be appropriate for trying to manage the pavement mintencnace activities on the high level budgeting side of the program.

- Pubworks would be very beneficial when the Navajo DOT wants to implement an asset management program for all items in the inventory.