

2021 Navajo Nation

Long Range Transportation Plan



CONTENTS

1.0	Introduction	1-1	4.0	Environmental Overview	4-1
1.1	Project Overview	1-1	4.1	Physical Conditions	4-1
1.2	Study Area	1-1	4.1.1	Topography	4-1
1.3	Public Involvement Process	1-1	4.2	Natural Resources	4-1
1.3.1	Navajo Nation Government Structure	1-3	4.3	Conflicts	4-1
1.4	LRTP Organization	1-4	5.0	Existing Transportation System	5-1
1.5	LRTP Development	1-4	5.1	Roadway Infrastructure	5-3
2.0	LRTP Goals	2-1	5.2	Bridges	5-4
3.0	Socioeconomic, Demographic & Land Use Data	3-1	5.3	Transit	5-6
3.1	Socioeconomic Profile	3-1	5.4	Bicycle & Pedestrian Facilities	5-9
3.1.1	Population	3-1	5.5	Intelligent Transportation Systems (ITS)	5-15
3.1.2	Households & Families	3-1	5.6	Safety	5-15
3.1.3	Education	3-1	5.6.1	Navajo Nation Strategic Highway Safety Plan (SHSP)	5-15
3.1.4	Labor Force & Employment	3-1	5.6.2	Statewide Safety Plans (safety toolkit)	5-23
3.1.5	Income	3-1	5.6.3	Safer Tribal Communities Toolkit	5-24
3.1.6	Poverty	3-1	5.7	Freight	5-24
3.1.7	Travel to Work	3-1	5.8	Airports	5-27
3.1.8	Age Cohorts	3-1	5.8.2	Federal Identification	5-28
3.1.9	Future Population	3-3	5.8.3	State Identification	5-28
3.2	Land Use Pattern	3-3	5.8.4	Navajo Nation Classification	5-28
3.2.1	Growth Centers	3-4	6.0	Transportation Funding	6-1
3.3	Parks, Open Space, & Recreation	3-6	6.1	Committed & Planned Transportation Improvements	6-1
3.3.1	Scenic Byways & Tourist Destinations	3-6	7.0	Project Partnering	7-1
3.3.2	National Monuments & Recreation Areas	3-6	7.1	Federal Agencies	7-1



2021 Navajo Nation

Long Range Transportation Plan



7.1.1	Bureau of Indian Affairs.....	7-1	9.1	Monitoring Progress.....	9-1
7.1.2	U.S. Department of Transportation	7-1	9.2	Decision Making.....	9-4
7.1.3	Federal Aviation Administration	7-1	9.3	Transit Recommendations	9-5
7.1.4	Federal Transit Administration	7-1	9.4	Prioritization Process.....	9-5
7.1.5	U.S. Department of Housing and Urban Development.....	7-1			
7.1.6	U.S. Environmental Protection Agency	7-2			
7.2	State Agencies	7-2			
7.2.1	Arizona Department of Transportation	7-2			
7.2.2	New Mexico Department of Transportation.....	7-3			
7.2.3	Utah Department of Transportation	7-3			
7.3	Regional Governments.....	7-4			
7.3.1	Northern Arizona Council of Governments.....	7-4			
7.3.2	Northwest New Mexico Council of Governments	7-5			
7.3.3	North Central New Mexico Economic Development District.....	7-5			
7.3.4	Mid Region Council of Governments (MRCOG).....	7-5			
7.3.5	Farmington Metropolitan Planning Organization	7-5			
7.3.6	Southeastern Utah Association of Local Governments	7-5			
7.4	Local Governments / Counties	7-5			
7.5	Navajo Nation Divisions and Departments.....	7-5			
8.0	Strategies and Performance Measures	8-1			
8.1	Inventory	8-1			
8.2	Needs Identification	8-2			
8.3	Prioritization.....	8-3			
8.4	TTIP Budgeting	8-4			
9.0	Implementation and Monitoring.....	9-1			



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2021 Navajo Nation

Long Range Transportation Plan



List of Figures

Figure 1-1 Navajo Nation Geographic Vicinity	1-1
Figure 1-2 Agency and Chapter Boundaries	1-5
Figure 2-1 Paved Surface Conditions.....	2-1
Figure 2-2 LRTP and TTIP Processes and Relationships	2-4
Figure 2-3 State SHSP Relationships to Other Plans	2-8
Figure 2-4 Navajo Nation.....	2-10
Figure 2-5 Bicycle and Pedestrian Accommodation Factors	2-12
Figure 2-6 Roadway Cross Section Components	2-13
Figure 3-1 Growth Centers and Destinations	3-5
Figure 3-2 Scenic Byways.....	3-6
Figure 3-3 Parks, Open Space & Recreation.....	3-8
Figure 4-1 Region Topography	4-2
Figure 5-1 Road Functional Classification.....	5-2
Figure 5-2 Cumulative Distribution of BIA Bridge Sufficiency Rating from 2008, 2013, and 2021 Data.....	5-4
Figure 5-3 2013 Curb or Sidewalk Width on Either Side of Bridge.....	5-6
Figure 5-4 Current NTS Routes	5-8
Figure 5-5 ADOT, Top Candidates for New Intercity Section 5311 Program Service	5-9
Figure 5-7 Existing Road Shoulder Width	5-12
Figure 5-8 Ranking of Shoulder Width Condition	5-13
Figure 5-9 Crash Severity in Navajo Nation	5-17
Figure 5-10 High Crash Density Analysis Areas.....	5-18
Figure 5-11 Shiprock Area Right-of-Way/Yield Related Crashes	5-18
Figure 5-12 Severe Corridor Crash Densities.....	5-19
Figure 5-13 Count of Crash Records from State and Tribal Databases for Arizona - Years 2008-2012	5-19
Figure 5-14 Police Districts	5-21
Figure 5-15 National Freight Rail and Roadway Corridors.....	5-26
Figure 5-16 Funding Scenarios and Associated Costs	5-27
Figure 5-17 Private & Public Airports	5-30
Figure 6-1 FY2021 Navajo DOT Total Funding	6-1
Figure 6-2 Pre-Project Development Timeline.....	6-3

Figure 6-3 Potential Project Phasing Strategy.....	6-4
Figure 6-4 Improvement Strategies for Navajo DOT.....	6-4
Figure 6-5 Project Development Process.....	6-5
Figure 7-1 Navajo Nation Governmental Boundaries	7-7
Figure 8-1 Inventory Related Strategies	8-1
Figure 8-2 Inventory Related Performance Measures	8-2
Figure 8-3 Needs Identification Strategies	8-2
Figure 8-4 Needs Identification Performance Measures.....	8-2
Figure 8-5 Prioritization Strategies	8-3
Figure 8-6 Prioritization Performance Measures	8-4
Figure 8-7 TTIP Budget Priorities.....	8-4
Figure 9-1 Three-Phased Improvement Approach.....	9-2
Figure 9-2 Decision Making Process.....	9-4

List of Tables

Table 1-1 Chapter Name Reference	1-6
Table 2-1 Road Maintenance Strategy.....	2-2
Table 2-2 Bridge Maintenance Strategy	2-3
Table 5-1 Road Ownership by Mileage.....	5-1
Table 5-2 BIA Operated Roads by Class Code	5-3
Table 5-3 Tribal Operated Roads by Class Code.....	5-3
Table 5-4 Current NTS Routes.....	5-7
Table 5-5 Future NTS Routes	5-7
Table 5-6 Identified State Bicycle Routes.....	5-10
Table 5-7 Identified Pedestrian Facility Improvements	5-10
Table 5-8 Arizona, New Mexico, and Utah State Emphasis Areas.....	5-16
Table 5-9 Safety Emphasis Areas by State SHSP.....	5-23
Table 9-1 Road Maintenance Priority	9-2
Table 9-2 Bridge Maintenance/Replacement Priority	9-3



2021 Navajo Nation

Long Range Transportation Plan



Appendices

Appendix A – Road Summaries

Appendix B – Pavement Maintenance Strategy

Appendix C – Bridge Summaries

Appendix D – Pedestrian Accommodation Needs

Appendix E – Functional Classification Cross Sections

Appendix F – Eligible Routes Listing

Appendix G – Proposed New Routes

Appendix H – Collaboration Improvements with Other Agencies

Appendix I – Washout Areas

Appendix J –Deferred Maintenance List

Appendix K – Airport Improvements

Appendix L – Strategic Highway Safety Plan (SHSP)

Appendix M – Survey Results

Appendix N – Goals

Appendix O – Navajo DOT Processes



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1.0 INTRODUCTION

1.1 PROJECT OVERVIEW

The 2021 Navajo Nation Long Range Transportation Plan (LRTP) is a multi-year planning process to research, draft and develop a path forward for multimodal transportation investment within the Navajo Nation. The LRTP defines a set of goals to provide funding guidance in order to improve overall transportation system conditions, and direct funding towards the types of investments that are needed most. The LRTP also identifies short and long-range transportation improvement strategies that will address current and future transportation needs according to Tribal, Federal, and State government policies.

As required by the statutory requirement 25 CFR 170, the Navajo Nation LRTP is necessary because it serves as the defining vision for the region's transportation needs. The LRTP continually remains proactive as it is updated every five years. Multimodal transportation spending includes investing in infrastructure and strategies to improve mobility for those that drive, bicycle, walk, fly, use transit, and ship freight.

1.2 STUDY AREA

Encompassing over 27,000 square miles, the Navajo Nation is the largest tribal community in the United States. The Nation's territory occupies portions of three states including southeastern Utah, northeastern Arizona, and northwestern New Mexico. This geographic size is larger than 10 U.S. states and includes five regional governments and 11 counties. Figure 1-1 illustrates the Navajo Nation boundary as it overlaps into the State of Utah, Arizona, and New Mexico.

1.3 PUBLIC INVOLVEMENT PROCESS

This long-range planning process included a public involvement process that occurred during COVID, including a community survey (shown in Appendix M), public meetings and comment card feedback. The community survey further revealed transportation needs within Navajo Nation. While the majority of respondents did not know what an LRTP was, respondents did understand about the Community Land Use Plan (CLUP). This effort pivoted from the 2015 LRTP Goals and reverified the goals. Previous input included the need for improving travel safety, signage, and sidewalks ranked the highest amongst respondent's goals along with resurfacing paved roads. The survey also revealed the majority of respondents do not feel safe while driving, walking, or biking within their communities, yet indicated that improvements would encourage more walking or biking. The Navajo Division of Transportation (Navajo DOT) Planning Department conducted a presentation to the Navajo Nation Resources and Development Committee (RDC) in October 2021. The RDC is the Committee responsible for approving the LRTP and the Navajo DOT Tribal Transportation Improvement Program (TTIP).

Figure 1-1 | Navajo Nation Geographic Vicinity



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1.3.1 NAVAJO NATION GOVERNMENT STRUCTURE

The Navajo Nation's inherent right to self-govern is sacred and demonstrated through daily governmental actions. Navajo government has evolved into the largest and most sophisticated form of American Indian government. The Navajo Nation Council Chambers hosts 24 council delegates representing 110 Navajo Nation chapters. As the governing body of the Navajo Nation, the Navajo Nation Council has the authority to pass laws which govern the Navajo Nation, members of the Navajo Nation, and certain conduct of non-member Indians and non-Indians within the territorial boundaries of the Navajo Nation. The Navajo Nation central government is composed of three branches headquartered in Window Rock, Navajo Nation (Arizona):

1. Legislative Branch (Navajo Nation Council);
2. Judicial Branch (District Courts, Family Courts, Peacemaker Courts, and a Supreme Court); and
3. Executive Branch (Presidents and Navajo Nation Divisions)
4. Chapters (local government subdivisions)

All branches of the Navajo Nation government exercise varied delegated powers and governmental authority in accordance with Navajo statutory, regulatory, and common law. Within Navajo Nation, regional coordination also exists on an Agency and Service Center level.

DIVISIONS & DEPARTMENTS

Navajo Nation has a relatively large government structure when compared to other tribal governments. Navajo Nation is comprised of 12 Divisions or Departments, they include:

- Division of Community Development
- Department of Dine Education
- Division of Economic Development
- Environmental Protection Agency
- Division of Public Safety
- Division of General Services
- Division of Health

- Division of Human Resources
- Division of Natural Resources
- Division of Social Services
- Division of Finance
- Division of Transportation

AGENCIES

Agencies act as the regional government structures that are comprised of several local government division Chapters. In total, seven Agencies exist within Navajo Nation, and an Navajo DOT Planner is assigned to each Agency:

- Chinle Agency: 15 Chapters
- Eastern/Crownpoint Agency: 31 Chapters
- Fort Defiance Agency: 26 Chapters
- Northern/Shirock Agency: 20 Chapters
- Western/Tuba City Agency: 18 Chapters
- New Lands Agency
- NIIP (Navajo Indian Irrigation Project) Agency

These Agencies and the Chapters within their boundaries are illustrated in Figure 1-2.



2021 Navajo Nation

Long Range Transportation Plan



CHAPTERS

Local government subdivisions (known as Chapters) are one of the three branches of government. In total, 110 Chapters exist throughout Navajo Nation. Figure 1-2 illustrates the Chapter boundaries and Table 1-1 lists the Chapters. Each Chapter is charged with creating a Community-Based Land Use Plan, also known as a CLUP. A CLUP is a locally developed land use plan that emphasizes housing and related infrastructure development in accordance with the Native American Housing Assistance and Self Determination Act (NAHASDA).

1.4 LRTP ORGANIZATION

The LRTP document is organized in the following manner to provide a background on existing socioeconomic and transportation asset conditions, and to outline the steps to improve and measure system level performance, including:

- Chapter 2: LRTP Goals
- Chapter 3: Socioeconomic, Demographic & Land Use Data
- Chapter 4: Environmental Overview
- Chapter 5: Existing Transportation System
- Chapter 6: Transportation Funding
- Chapter 7: Project Partnering
- Chapter 8: Strategies and Performance Measures
- Chapter 9: Implementation Program

1.5 LRTP DEVELOPMENT

The LRTP was developed through a collaborative process that went through the following steps:

1. Establish Policy Goals and Objectives
2. Analyze Transportation System Conditions
3. Perform Needs Analysis
4. Set Priorities
5. Establish Funding Plan

6. Develop the Plan
7. Develop the Program
8. Implement and Monitor the Plan

The intent of how this plan was developed, and will be monitored for performance, was to enable Navajo DOT to use the most up to date information to facilitate change through data-driven and transparent processes so ultimately, this regional plan and local Chapter plans are consistent. This transition will also be influenced as Navajo DOT develops the processes and procedures relating to self-administrating their transportation program. This LRTP will maintain a set of appendices that outline specific transportation system deficiencies so priorities can be adjusted as updated data is collected and analyzed so system performance can improve including better roads, sound bridges, safe travel for all modes, and opportunities for economic development can occur.



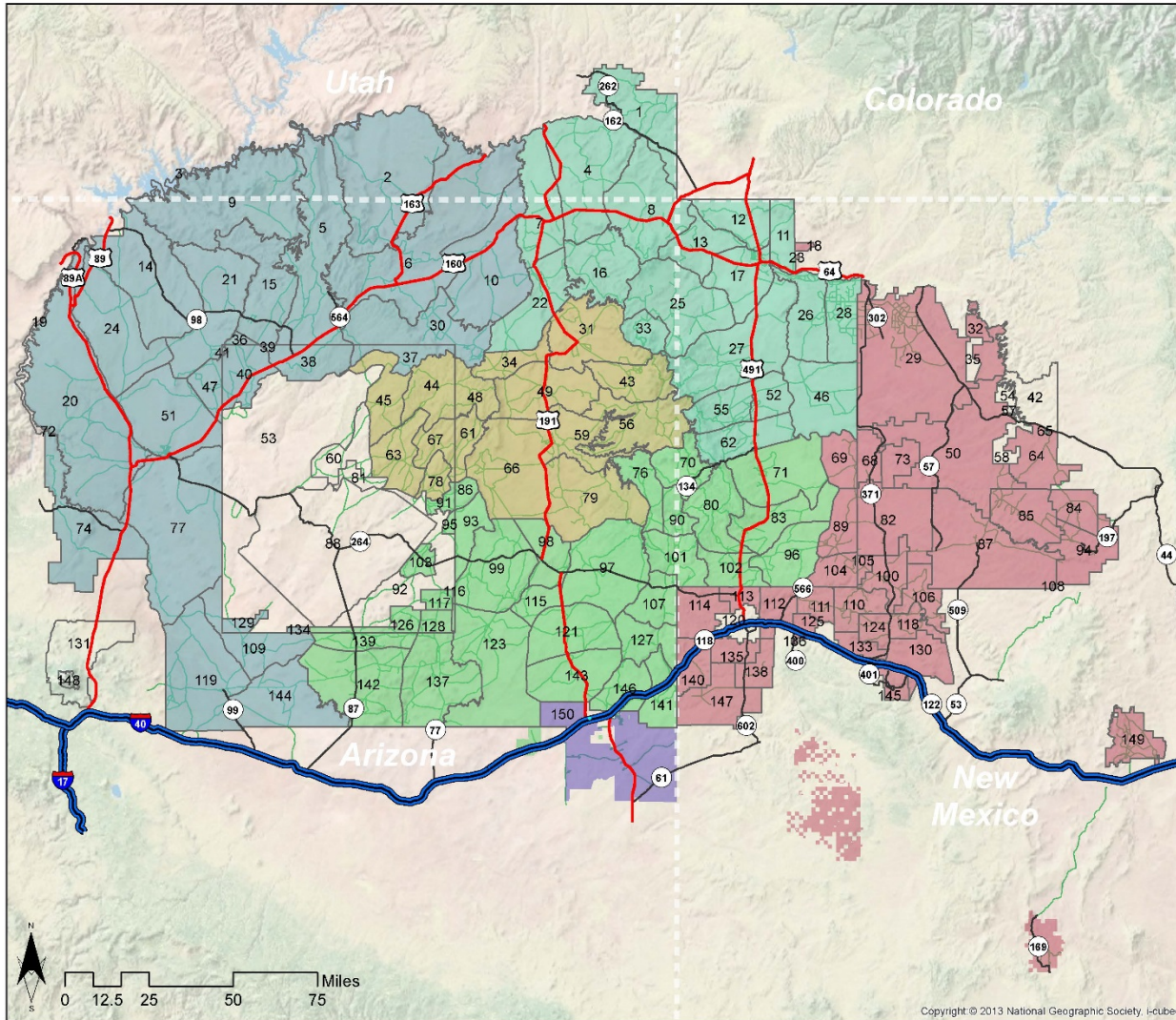
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Figure 1-2| Agency and Chapter Boundaries



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Agency Boundaries

- Chapter Boundaries
- Chinle
- Crown Point
- Fort Defiance
- New Lands
- Shiprock
- Tuba City
- BIA Route

Chapter numbers correspond to chapter names. Refer to Table 1-1 for corresponding Chapter names.



2021 Navajo Nation

Long Range Transportation Plan



Table 1-1| Chapter Name Reference

LABEL NUMBER	CHAPTER NAME				
1	ANETH	38	SHONTO (SOUTH)	79	NAZLINI
2	OLJATO	39	INSCRIPTION HOUSE (S.)	80	MEXICAN SPRINGS
4	RED MESA	40	TONALEA (SOUTH)	82	BECENTI
5	SHONTO (NORTH)	41	KAIBETO (SOUTH)	83	TOHATCHI
6	KAYENTA	43	LUKACHUKAI	84	OJO ENCINO
7	MEXICAN WATER	44	BLACK MESA	85	PUEBLO PINTADO
8	TEEC NOS POS	45	FOREST LAKE	86	LOW MOUNTAIN (EAST)
9	NAVAJO MOUNTAIN	46	BURNHAM	87	WHITEHORSE LAKE
10	DENNEHOTSO	47	TONALEA (WEST)	89	STANDING ROCK
11	HOGBACK (WEST)	48	BLACK MESA	90	RED LAKE
12	GADIIAHI	49	MANY FARMS	91	LOW MOUNTAIN (WEST)
13	BECLAHBITO	50	NAGEEZI	93	JEDDITO, AOACGE
14	LECHEE	51	TUBA CITY	94	TORREON (NORTH)
15	INSCRIPTION HOUSE (NORTH)	52	NEWCOMB	95	JEDDITO (EAST), NAVAJO
16	SWEETWATER	55	TWO GREY HILLS	96	COYOTE CANYON
17	SHIPROCK	56	TSAIL/WHEATFIELD	97	KINLICHEE
18	HOGBACK (NORTH)	59	CHINLE	98	GANADO
20	BODAWAY	61	TACHEE (EAST)	99	STEAMBOAT (EAST)
21	KAIBETO (NORTH)	62	SHEEP SPRINGS	100	CROWNPOINT
22	ROCK POINT	63	PINON	101	FORT DEFIANCE
23	HOGBACK (SOUTH)	64	COUNSELOR	102	TWIN LAKES
24	COPPERMINE	66	TSELANI	103	JEDDITO (WEST), NAVAJO
25	RED VALLEY	67	TACHEE (WEST)	104	NAHODISHGISH (WEST)
26	NENAHNEZAD/SAN JUAN	68	WHITE ROCK (EAST)	105	NAHODISHGISH (EAST)
27	SANOSTEE	69	WHITE ROCK (WEST)	106	LITTLEWATER
28	UPPER FRUITLAND	70	CRYSTAL	107	SAINT MICHAELS
29	HUERFANO (WEST)	71	NASCHITTI	108	TORREON (SOUTH)
30	CHILCHINBITO (NORTH)	72	CAMERON (NORTH)	109	TOLANI LAKE (SOUTH)
31	ROUND ROCK	73	LAKE VALLEY	110	MARIANO LAKE
32	HUERFANO (EAST)	74	CAMERON (SOUTH)	111	PINEDALE
33	COVE	75	BBR	112	CHURCH ROCK
34	ROUGH ROCK	76	SAWMILL	113	ROCK SPRINGS
36	TONALEA (NORTH)	77	COALMINE MESA	114	TSAYATOH
37	CHILCHINBITO (SOUTH)	78	WHIPPOORWILL	115	CORNFIELDS



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Long Range Transportation Plan



Source: Community Development



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2.0 LRTP GOALS

Since Navajo DOT became a Division, the DOT has worked to identify how to be more efficient and effective in managing the transportation system. Navajo DOT became self-administered to better control how federal funds are spent between Navajo DOT and Bureau of Indian Affairs (BIA). After the last LRTP was completed, Navajo DOT worked with Federal Highway Administration (FHWA) to convert the previous 38-year TTIP to the current 5-year TTIP. This enables Navajo DOT to focus on planning, designing, obtaining needed environmental clearances and performing construction activities in a systematic manner. The TTIP outlines specific Navajo DOT project activities over a 5-year period and is updated every year with new projects being added in "Year 5" to maintain focus on those programmed projects, not to waste Navajo DOT funding, and does not jeopardize future FHWA project funding.

There are seven key goals of the LRTP, including:

Take Care of the System - The Nation has invested a significant amount of money on maintaining the existing transportation system which is very important. It should be maintained to a level that corresponds to the function and use of the roadways and bridges. This transportation system requires a significant amount of maintenance resources to maintain, repair and reconstruct the roads and bridges that are deficient. These activities require very important environmental clearances and permits to do any work on the roadways, which takes time and coordination with many agencies.

- The system is in great need of repair and maintenance. Focus on the greatest needs first – those with high traffic volumes, safety issues and are of the highest functional classification.
- Maintain and share data with the communities and stakeholders for informed decision making.

- Conducting maintenance activities on roads and bridges is a cost-effective way to save money rather than waiting until reconstruction is warranted.
- Create funding "pools" for separate bridge, safety and roadway funds.

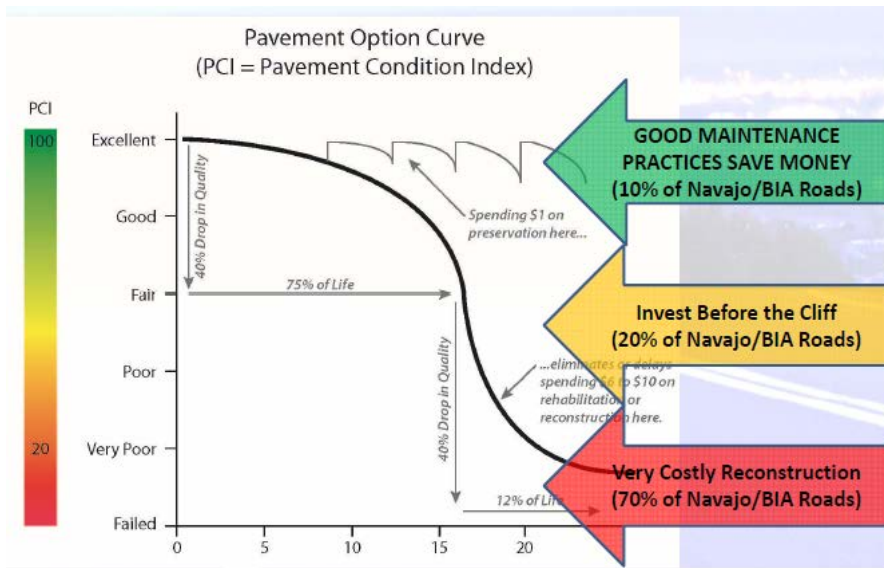
The roadway system is made up of paved, gravel and dirt roads. Each has their purpose, and careful consideration should be made before any improvements are made. Figure 2-1 summarizes the Navajo Nation paved road system conditions based on the official 2020 National Tribal Transportation Facility Inventory (NTTFI) dataset. As shown, approximately 10% of the paved system is in good or better condition; 20% is in fair condition; and the remaining 70% is in poor or failing condition based on the inventory. This situation is caused by not enough resources being directed towards maintenance and reconstruction activities versus constructing new roads and upgrading roads to pavement without an increased budget for maintaining those roads once improved. National research has shown that properly maintaining paved roads is a cost-effective approach versus allowing the pavement quality to deteriorate to the level of need for major maintenance or reconstruction.

Figure 2-1| Paved Surface Conditions



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Long Range Transportation Plan



Both gravel and dirt roads also require ongoing maintenance activities including blading and surface treatments. There is not enough funding, equipment or staff available to maintain all of the roads that Navajo DOT and BIA are responsible for. As such, priorities must be set to maintain roads in good condition while improving fair roads, bringing them up to good condition. The priorities should be based on both quantitative data such as functional classification, average annual daily traffic (AADT), crash experiences/safety, and historic maintenance needs required to keep the roadway properly maintained. Table 2-1 depicts a strategy related to functional classification and AADT, and roadway condition for paved and gravel roads. The approach outlined in Table 2-1 uses a strategy of keeping roadways that are in good condition from deteriorating more, while bringing roads that are in fair condition up to "good" before major reconstruction activities on failed pavement surfaces takes place due to the expenses required to reconstruct a roadway. This approach also greatly reduces the attention on local roads that carry low traffic volumes. The local roads that are important to communities should be integrated into the Department of

Roads blading schedule as appropriate. Notes included in Tables 2-1 and 2-2 indicate if a maintenance strategy is a low, moderate or high priority project.

Table 2-1| Road Maintenance Strategy

	<100 AADT	100-249 AADT	250-499 AADT	500-999 AADT	1000+ AADT
Major Arterial	Low	Low	Moderate	High	High
Minor Arterial	Low	Low	Moderate	High	High
Collector	Low	Low	Moderate	High	High
Local*	Low	Low	Moderate	High	High
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 Navajo DOT.



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Bridges are also a critical component to transportation and mobility. Table 2-2 depicts a strategy related to roadway functional classification and the actual bridge condition surveyed in the bridge reporting to Navajo DOT.

Table 2-2| Bridge Maintenance Strategy

	Failure	Fair	Good	Excellent
Major Arterial	High	Moderate	Low	n/a
Minor Arterial	High	Moderate	Low	n/a
Collector	High	Moderate	Low	n/a
Local*	High	n/a	n/a	n/a

The approach outlined in Table 2-2 focuses attention on the bridges that are in greatest need first. To accomplish this, a dedicated funding pool specifically for bridges is recommended. A ten percent funding program could address the most critical-need bridges in a 7-year program. See Section '5.2 Bridges.'

To accomplish the goal of taking care of the system, it will require a focused attention to collecting, maintaining and sharing the road inventory data among departments and divisions, community members and administrative service center staff. This approach will lead to improved data-driven, performance-based discussions with elected and appointed officials so informed decision making is enhanced. Figure 2-2 depicts how the processes of inventorying, identifying needs and prioritizing are LRTP related functions that then influence the TTIP process of project development and construction activities. Reference Section 8.0 for respective strategies and performance measures that form the basis of performance-based planning that drive the TTIP.

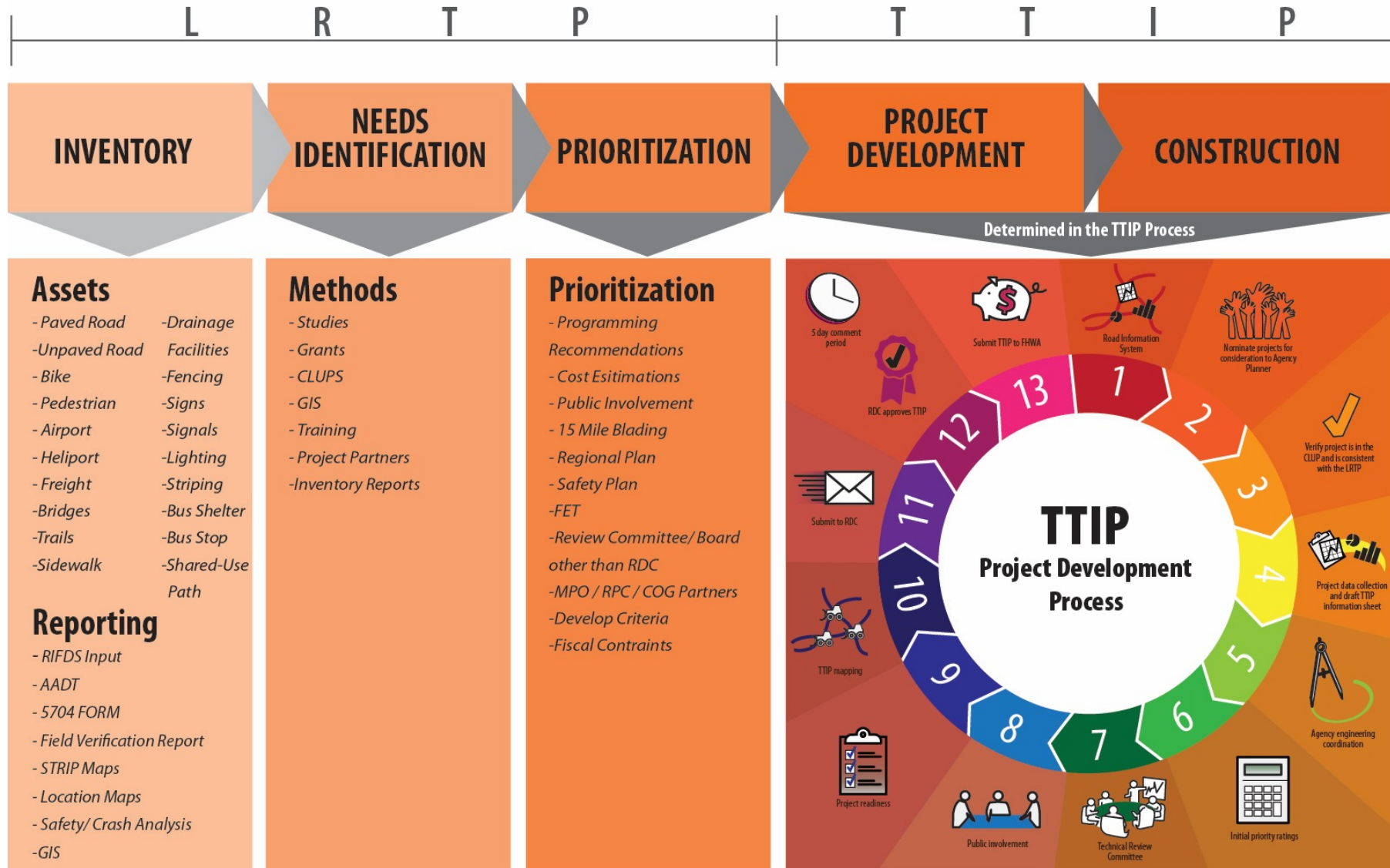


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Figure 2-2| LRTP and TTIP Processes and Relationships



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Enhance Existing Partnerships and Create New Partnerships – The relationships between Navajo Nation and the many funding partners that promote and assist in providing a safe and effective transportation system should continue to be enhanced to explore opportunities that further the goals of Navajo Nation, promote economic development and provide jobs.

Factors to consider:

- Many transportation programs are funded with money that is not Navajo Division of Transportation funds.
- Over the past few years, Navajo DOT has partnered with many Chapter, local counties, Navajo Divisions, state and federal agencies to assist with roadway maintenance, improve roadway safety, make highway improvements, and conduct planning studies. These partnerships are very important to Navajo DOT. The creation of projects that further multiple organizations' goals allows for limited funding to be stretched further.
- Available funding programs are very important to improve partnerships with other funding agencies is important to provide transportation choices, improve safety and upgrade our roads.
- Private industry is also an important partner to consider as economic development opportunities occur.



2021 Navajo Nation

Long Range Transportation Plan



Maximize Transportation Investment Effectiveness – Transportation investments should be broadly discussed and vetted to direct funding to those needs that have the greatest positive impact on achieving local chapter, agency, Navajo DOT, State DOT, BIA and FHWA goals as appropriate.

- Every dollar that is invested in the transportation system is a long-term investment, regardless of if it is maintaining or upgrading an existing road or building a new one. Trade-offs exist with every decision– whether to construct a new paved roadway (\$3.0 million per mile), gravel a dirt roadway (\$400,000 per mile), maintaining gravel roads (\$2,000 per mile), blade dirt roads (\$700/mile) or fix a bridge that is in need of repair.
- The funding that is available is minimal, and is not expected to increase; however, traffic demands from communities will increase. Every effort must be made to reflect that money being spent on roadways is meaningful, long lasting and the improvements will be maintained after they are constructed.
- Transportation spending should be strategic in order to have the greatest positive impact towards achieving local and regional goals.
- The little amount of available funding is so important, therefore every dollar spent is a choice and a trade-off. Making sure there is an understanding of those trade-offs is very important.

Criteria and process should be fundamental to identifying priorities for improvement, and the types of improvements needed. Since there is not enough funding to address all of the Nations’ transportation needs, careful consideration should be given to each and every improvement. Every Chapter has transportation needs that are desired. These needs have to be balanced

with the available funding to determine if, how and to what extent an improvement project can address the needs. Navajo DOT has a regional and nationwide responsibility in investing in transportation. With this responsibility, safely connecting Chapters and commercial centers is a primary responsibility of Navajo DOT.



In many cases, the traffic demands may provide surface-type options. Evaluating and arriving at an improvement decisions that balance the need (demand) with the investment amount (improvement type) should be data, financial and impact driven.



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Bridges are expensive to construct and maintain. In some cases, low water crossings could be a viable option that provides a safe crossing while being financially careful.



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Enhance Safety – Transportation investments, maintenance activities, and improvements should improve the safety of all roadway users to minimize the potential for all serious injuries and fatalities.

- Transportation safety is at the forefront of the Navajo DOT transportation program. The Nation must have a safe transportation system for all roadway users and decrease the number of fatality and serious injury crashes.
- There has been a significant push at the federal level to invest in safety, and Navajo DOT has been able to obtain several grants to assist in helping with this important goal.
- Transportation spending should try to improve the safety for roadway users.
- It is important to reduce the potential for fatal and serious injury crashes.
- Safety/crash information should be shared across agencies to enhance the likelihood for more state and federal safety funding.
- Improving transportation safety can be implemented through investing in the 4-E's (engineering, education, enforcement and emergency services).

All crashes are caused by either driver behavior (education and enforcement focused), geographic/geometric issues (engineering focused), or natural events (education and engineering focused). Proactively reducing crashes through education can influence many factors such as improving seat belt use, properly restraining minor children, and reducing alcohol related crashes. Enforcing the driving laws of Navajo Nation provide the regulatory strength of a safe system. The engineering component is both reactive and proactive in nature. The reactive nature of safety is fixing "hot spots" where high crash locations exist by conducting Road Safety Audits/analyses/ studies and implementing countermeasures. The proactive aspect of safety is using

historic data to understand systemic system problems. The emergency services element of the 4-E's is critical to enhance the effectiveness and timeliness of emergency medical services in the event of a crash. For any safety effort, utilizing a collaborative, data-driven approach that incorporates transportation-safety research, analysis and documentation of the database of crash records, and other data, to identify safety Emphasis Areas and prioritize safety strategies.

The states of Arizona, New Mexico and Utah have all developed Strategic Highway Safety Plans (SHSSs) that are consistent with the national movement of **Toward Zero Deaths**. Each state has their own set of goals and objectives to address the pervasive types of crashes being experienced on their systems. Since Navajo Nation has territory in three states, the three separate SHSPs relate only to their specific, representative state. Each state also has their own set of Emphasis Areas and performance measures to address and monitor progress in mitigating specific types of crashes in the respective states. This relates directly to the available Highway Safety Improvement Program (HSIP) funding that is available through the three states. To be eligible for HSIP funding, the effort must be consistent with the appropriate state SHSP as shown in Figure 2-3. Navajo Nation can always focus funding towards other programs not included in the state SHSPs; however funding for those programs would need to be from sources other than state DOTs. This is separate from the Navajo Nation 2017 SHSP, which provides an additional level of analysis and understanding of safety on Navajo Nation roadways.

Figure 2-3| State SHSP Relationships to Other Plans

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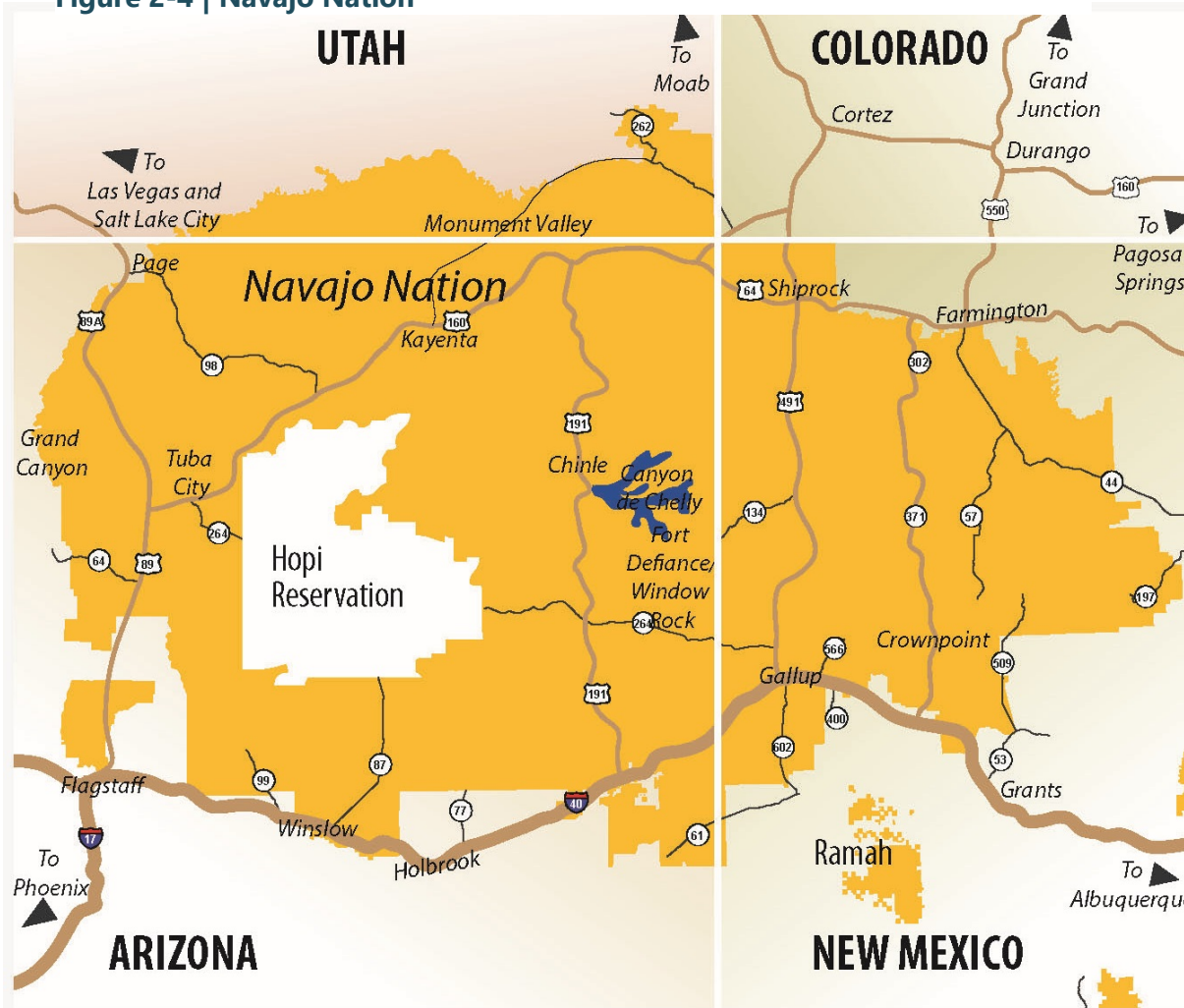
Create Connections – The transportation system should assist in providing seamless connectivity between the population centers and Chapters within Navajo Nation, public services and facilities, and the population centers and transportation systems surrounding Navajo Nation (Figure 2-4).

- It is that opportunities are provided for the citizens to travel within the communities they live in, and travel to other communities within and outside of Navajo Nation.
- All communities need connectivity to surrounding activity centers for school, government, work, shopping, groceries and commerce.
- There are connections outside of Navajo Nation that could enhance the quality of life for many. These connections are important to provide and maintain.
- The transportation systems (Greyhound bus, airports, Amtrak, etc...) are important to connect with to enable travel beyond Navajo Nation and the surrounding communities.

Currently, there is not public transportation provided or planned to Cortez, CO, Durango, CO, the Four Corners area, Holbrook, AZ, Winslow, AZ, and Page, AZ among other areas. In some cases, providing connections to these communities also provide access to their public transportation systems that service the regions around them.

From an economic development standpoint, creating connections can also improve visitation and attract “markets” of people such as bicycle riders. As an example, if there are safe routes to ride a bike that

Figure 2-4 | Navajo Nation



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connects the various attractions within Navajo Nation, bicycle riders may be more attracted to an area for group rides which positively impact the tourism aspect of the Nation.



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Provide Options – The transportation system should allow for safe travel for those that walk, bicycle, ride on public transportation, fly, and drive.

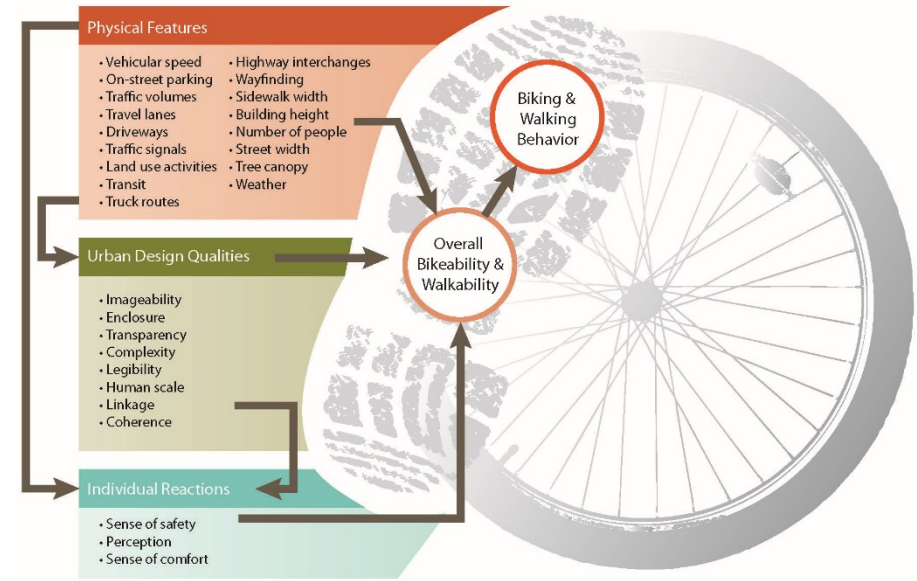
- Approximately 40% of the residents have income levels below poverty so a transportation system that provides options other than the automobile is important.
- Navajo DOT investments must provide safe options for those that cannot afford to drive their own car.
- Safe options for all that travel is critical for the success of our community.
- Navajo citizens and visitors should be able to safely walk, ride a bicycle or take transit if desired.



Figure 2-5 depicts many factors that relate to providing safe accommodation for bicyclists and pedestrians. These type of factors should be examined when planning and designing for bicycles and pedestrians.



Figure 2-5| Bicycle and Pedestrian Accommodation Factors



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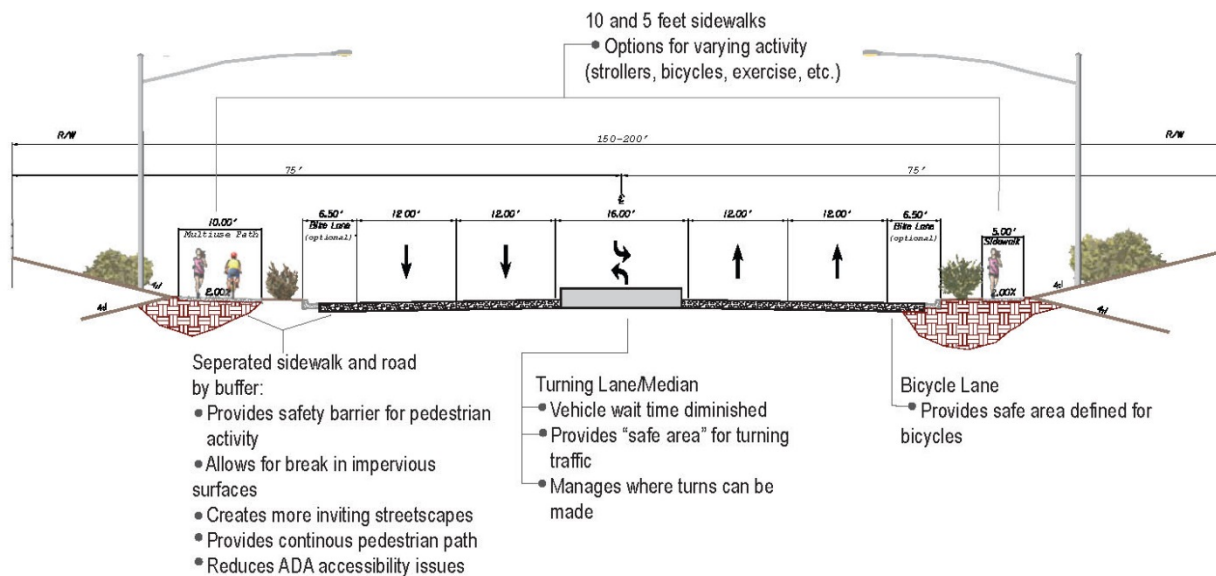
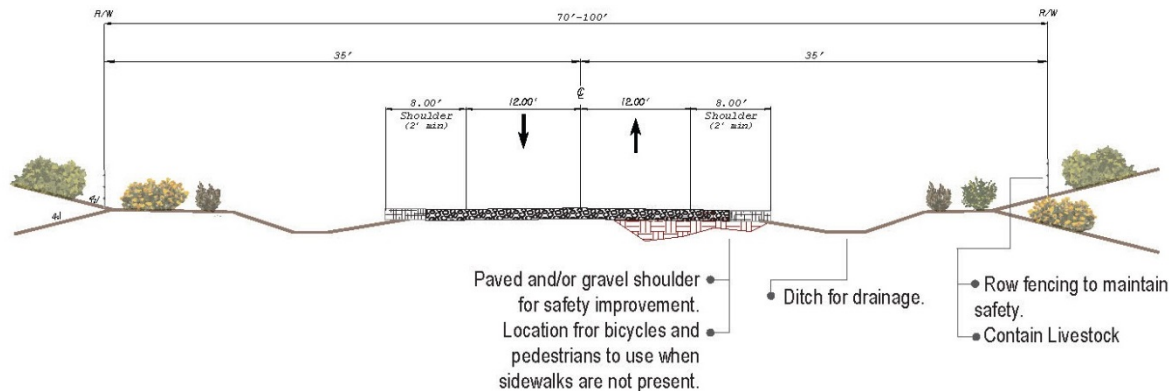
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Specifically pertaining to roadways, proposed improvements can have a significant impact on how well a road can improve upon safety and provide options for bicycling and walking. Figure 2-6 depicts specific roadway components that should be discussed as improvements are made. Appendix E depicts functional classification cross sections and characteristics of each. Ultimately, design standards will need to be developed for each approved cross sections.

Figure 2-6| Roadway Cross Section Components



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Promote Economic Development – New transportation investments should correlate closely with economic development, services and new jobs.

- Transportation spending for new roads should relate to new jobs and economic development.
- New development should try to locate where existing transportation systems exist.

Efforts should be taken to have cross-Division discussions when transportation investment is required. When new facilities such as schools, event centers, agency buildings, hospitals, shopping centers, industrial parks, airports, etc... are developed, these developments typically require a supporting transportation system to provide meaningful and safe access. In many cases, improvements are necessary to facilitate the meaningful and safe access to the new development. Understanding these costs, including continued maintenance costs, will promote sustainable economic development opportunities that have positive impact to all agencies, Divisions and communities involved.

Goal fact sheets are included in Appendix N.





3.0 SOCIOECONOMIC, DEMOGRAPHIC & LAND USE DATA

3.1 SOCIOECONOMIC PROFILE

The purpose of analyzing the socioeconomic profile of Navajo Nation is to develop a better understanding of the past, present and future conditions of the community. This section includes a summary of data collected from the U.S. Census Bureau American Community Survey (ACS) detailing the most recent data sets from 2019. Areas analyzed include population, households and families, education, labor force and employment, income, age cohorts, poverty, and how people travel to work. Showcasing these ACS factors helps to provide a comprehensive planning framework for growth cities and destinations, accessibility, tourism, and an overall cohesive transportation network.

3.1.1 POPULATION

According to the 2019 Census, the “Navajo Nation Reservation and Off-Reservation Trust Land, AZ, NM, and UT” data survey showed that the total population was 175,108. In 2019, the population increased to 184,015, which is a 5.08% change since 2016.

3.1.2 HOUSEHOLDS & FAMILIES

In 2019 there were 52,105 households on the Navajo Nation Reservation and Off-Reservation Trust Land. Nearly 31% of the households contained 4 or more people according to ACS data.

3.1.3 EDUCATION

In 2019, 12.9% of the population age 25 and over had no diploma, while 35.1% of Navajo Nation were high school graduates (with a diploma). 25.8% of the population had some college experience (without a degree), and 16.5% of people had an associate degree or higher.

3.1.4 LABOR FORCE & EMPLOYMENT

In 2019, 43.4% of the people 16 years of age and over were in the labor force. The unemployment rate in Navajo Nation was 12.8%, which is higher than both the national average (3.5%) and Arizona’s average (4.8)

3.1.5 INCOME

In 2019, the Navajo Nation and Off-Reservation Trust Land’s median household income was \$29,226; this is less than half of the 2019 U.S. household median income of \$68,703.

3.1.6 POVERTY

In 2019, 63,239 people, or 34.5% of the population (for whom poverty status is determined) in Navajo Nation lived at or below the poverty level.

3.1.7 TRAVEL TO WORK

Of the 51,937 employed individuals over 16 years of age, 43,411 (84%) drove alone to work, 3,668 (7%) carpooled, 351 (0.7%) used public transportation, 1,404 (2.7%) walked and 22 (less than .01%) bicycled.

3.1.8 AGE COHORTS

A population pyramid is a useful way to visualize age cohorts by gender. Figure 3-1 illustrates the age cohorts in relation to sex for Navajo Nation for year 2019.

In 2019, the largest cohorts were persons considered “Generation Z” ages 6 to 24 (30.9%) with a statistically slight majority of females; of this population of youth, the largest percentage of population falls between the ages of 10 and 14 years old. As the cohort groups increase in age the representative



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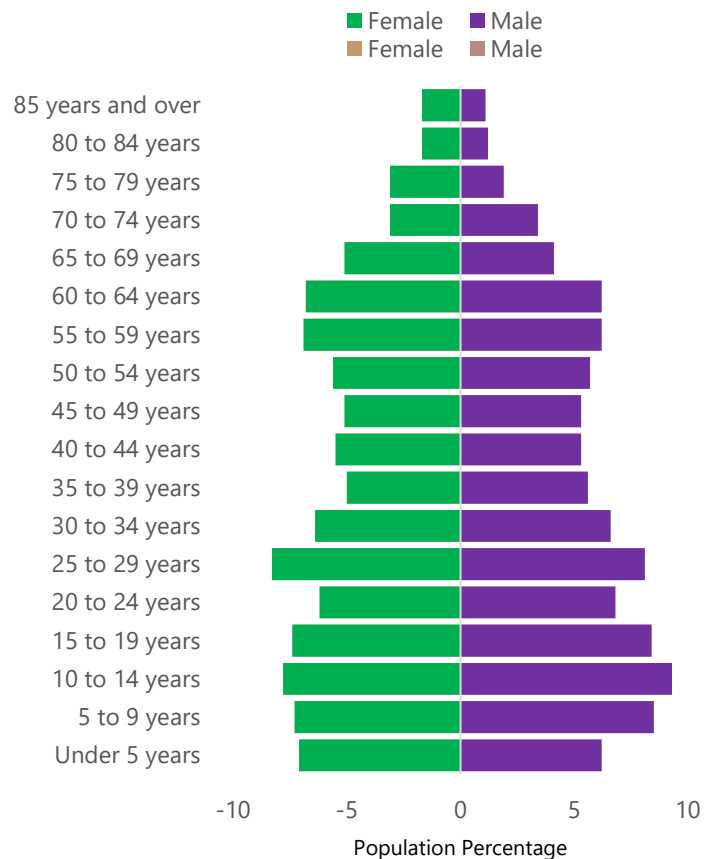
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percentage of the population decreases. As the cohort age passes 75 years old the reflective percentage decreased significantly, accounting for only 10% of the population.

Figure 3-1| Year 2019 Population Pyramid

Population Pyramid of Navajo Nation Reservation in 2019



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3.1.9 FUTURE POPULATION

In the 2009 Navajo Nation Long Range Transportation Plan, the future population was projected at an annual increase of 1.82% which would place the 2010 total population of the reservation at 216,131. According to the 2010 Census, the total population of the Navajo Nation Reservation was 173,667, which is 42,464 less than the projected population.

In working with the Navajo Nation Division of Community Development, that agency has identified that current population projections are not available due to contested issues with the 2010 Census.

3.2 LAND USE PATTERN

In order to understand the land use pattern of much of the Navajo Nation, the 2016 LRTP focused on the Primary and Secondary Growth Centers within Navajo Nation. The study of these growth centers identified the major road network, rivers or streams, and topography. Furthermore, we determined locations of landmarks within the growth centers and where civic/institutional and recreation activity nodes occur. This information is essential when planning for the future of Navajo Nation and accommodating predicted transportation needs.

Navajo Nation Chapters are each required to develop a CLUP. Historically, the CLUP has had minimal information relating to transportation related needs. Navajo DOT is now looking to use the CLUP for criteria for future project selection to make sure the applications for a project are consistent with local planning efforts. To achieve this, Navajo DOT is recommending that the following topics be included in future CLUP updates:

- Identify the highest priority dirt roads that should be bladed/graded (15-mile lists) and potentially upgraded to gravel, chip seal or pavement in the future (Take Care of the System).
- Describe any paved or gravel roads that need additional maintenance (Take Care of the System).
- Describe any sidewalks (if there are any) that need additional maintenance (Take Care of the System)

- Describe any proposed new roads or sidewalks that should be examined as part of future improvement projects (Create Connections).
 - If a new road is proposed, why does this road create a new connection? Why is it important to your community? Will this change an existing circulation pattern? Will this improve or affect safety?
 - If a new sidewalk is proposed, what facilities/activity centers are being connected?
- Describe any proposed enhancements for transit (Provide Options).
- Describe any proposed enhancements for walking and bicycling (Provide Options).
- Describe any proposed enhancements to access other transportation systems such as Greyhound and Amtrak (Provide Options).
- Describe any proposed airport / aviation enhancements (Provide Options).
- Describe how any proposed transportation enhancements will promote economic development identified in the CLUP-C Plan (Promote Economic Development).
- Describe any roads that you believe have motorist, bicycle and/or pedestrian safety issues (Enhance Safety).
- Describe how proposed developments in the CLUP-C Plan would require spending money on roads and sidewalks to connect to the new development (Maximize Transportation Investment Effectiveness).
 - Describe how proposed developments could be developed without additional spending on roads and sidewalks (is the development a smart investment for the community? Can the development go somewhere else? If the development needs a paved or graveled road for access, is the road providing access already paved or graveled?).
 - Describe if the proposed developments would increase truck traffic. Is the current road meant to carry heavy truck traffic?



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- Describe how proposed improvements would be paid for (Enhance Existing Partnerships and Create New Partnerships).
 - Did you receive a funding grant?
 - Who will have maintenance responsibility of this? Have they been involved in these discussions?
 - Does the new improvement involve a State Highway? Have the DOT been involved in these discussions?

3.2.1 GROWTH CENTERS

Primary Growth Centers include Chinle, Crownpoint, Fort Defiance, Kayenta, Shiprock, Tuba City, and Window Rock. Secondary Growth Centers include Alamo, Dilkon, Ganado, Leupp, Many Farms, Nahata Dził, Navajo, Pinon, Shonto, Tohajiilee, Tohatchi, and Tsaille Wheatfields. Figure 3-3 illustrates the Primary and Secondary Growth Centers including identifying landmarks and activity nodes.



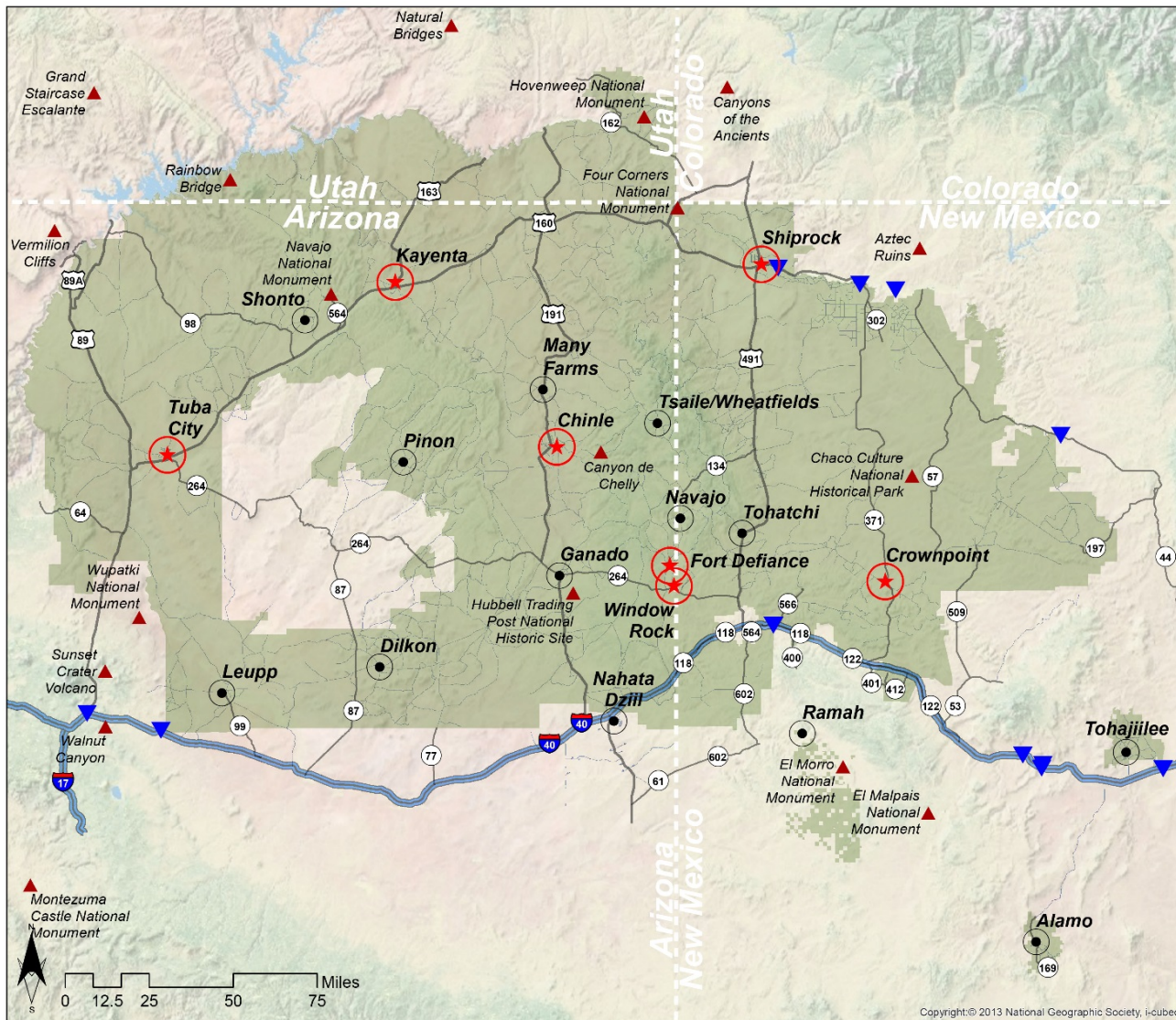
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Figure 3-1| Growth Centers and Destinations



Navajo Nation

Destinations

Growth Center

- Primary
- Secondary
- National Monument
- Casino and other destinations

Road Hierarchy

- Interstate
- US Highway
- State Highway
- BIA Routes



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3.3 PARKS, OPEN SPACE, & RECREATION

3.3.1 SCENIC BYWAYS & TOURIST DESTINATIONS

Figure 3-2 maps the numerous scenic byways that exist in Arizona, New Mexico and Utah. Numerous state byways pass through Navajo Nation. Federal scenic byways and All-American Roads that pass through Navajo Nation include:

- Trail of the Ancients;
- Jemez Mountain; and
- Historic Route 66.

3.3.2 NATIONAL MONUMENTS & RECREATION AREAS

NATIONAL MONUMENTS

In total there are 18 national monuments that are located within or near Navajo Nation; however, only eight of which sit directly within the Navajo Nation boundary. These eight national monuments include:

- Navajo National Monument (AZ);
- Canyon de Chelly (AZ);
- Hubbell Trading Post National Historic Site (AZ);
- Hovenweep National Monument (UT);
- Rainbow Bridge National Monument (UT);
- Chaco Culture National Historical Park (NM);
- El Morro National Monument (NM); and
- Four Corners National Monument (NM)

Figure 3-3 maps the locations of the National Monuments in or near Navajo Nation.

RECREATION AREAS

To determine the large recreation areas within or near Navajo Nation, surface management data was examined to identify which federal government entity oversees what pieces of land. The majority of Navajo Nation is classified

under the Bureau of Indian Affairs (BIA); however, two large pieces of land are listed under the National Park Service. These locations are the Canyon de Chelly in Arizona and the Chaco Culture National Historical Park in New Mexico. Areas outside of the Navajo Nation are managed by several entities including the Army, BIA, Bureau of Land Management (BLM), Bureau of Reclamation, U.S. Forest Service, U.S. Fish and Wildlife Service, National Park Service, state governments, local governments and private entities.

Figure 3-2| Scenic Byways



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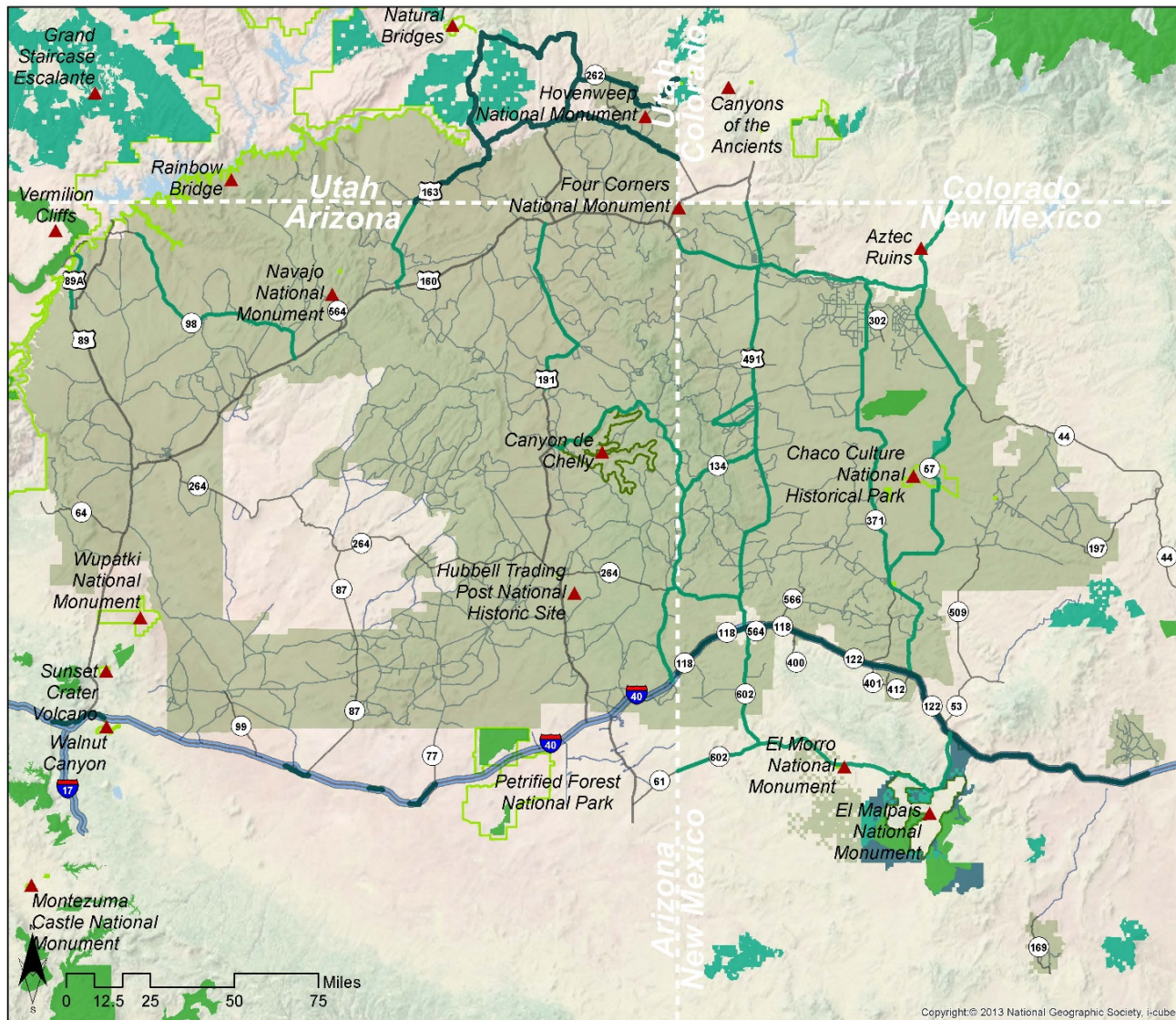
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Figure 3-3| Parks, Open Space & Recreation



Navajo Nation

Parks, Open Space, & Recreation

- National Monument
- Federal Scenic Byway
- State Scenic Byway
- National Conservation Area
- Wilderness
- Wilderness Study Area
- US Highway
- State Highway

Road Hierarchy

- Interstate

National Park Service Boundaries

- Legislated
- Legacy
- BIA Route





4.0 ENVIRONMENTAL OVERVIEW

As our transportation systems continue to grow and expand, our communities continue to experience issues of the built environment conflicting with that of the natural environment and our cultural resources. Through the various offices of State and Federal agencies, including the various DOTs, numerous studies and other efforts have helped to ensure an awareness and consideration for our environmental and cultural resources. The environmental overview section is divided into three categories as follows:

1. Physical Conditions;
2. Natural Resources;
3. Cultural Resources; and
4. Conflicts.

4.1 PHYSICAL CONDITIONS

An analysis of physical conditions provides details on the limitations of the natural environment and the potential impacts caused in development.

4.1.1 TOPOGRAPHY

Much of Navajo Nation is located in the high desert regions of Arizona, New Mexico and Utah. The terrain varies with steep canyons, high mountains and extensive natural features, therefore the Navajo Nation experiences a range of elevations. Winter weather in high elevations and dust storms during summer months can potentially affect transportation construction, maintenance schedules, materials, safety measures, and overall costs. Figure 4-1 illustrates some of the physical relief features of the region. Topography is an important consideration as transportation facilities are improved and planned.

4.2 NATURAL RESOURCES

A natural resources overview was conducted to understand the potential for wildlife, water resources, and wetlands in the potential area of impact. As

areas continue to develop, impacts to natural resources should be avoided or minimized. However, there may be instances where other alternatives may not exist; in which case, minimizing or mitigating impacts may be the necessary course of action. This natural resources analysis identifies potential impacts which can be used in refining a project development process. Navajo Nation Environmental Protection Agency has established processes for environmental review for both Navajo Nation and federal based regulations.

4.3 CONFLICTS

National Environmental Policy Act (NEPA), signed into law in 1970, established the environmental protection policy. NEPA requires that all Federal agencies consider the environmental consequences of their proposals, document the analysis, and make this information readily available to the public prior to implementation. Similarly, the Federal Highway Administration (FHWA) desires to avoid transportation projects with large social and natural environment impacts and has partnered with NEPA to create the FHWA NEPA project development process. This process takes into consideration the potential impacts on both the human and natural environment, as well as the public's need for safe and efficient transportation. Maintaining a balance between growth and preservation is crucial to the sustainability of Navajo Nation.

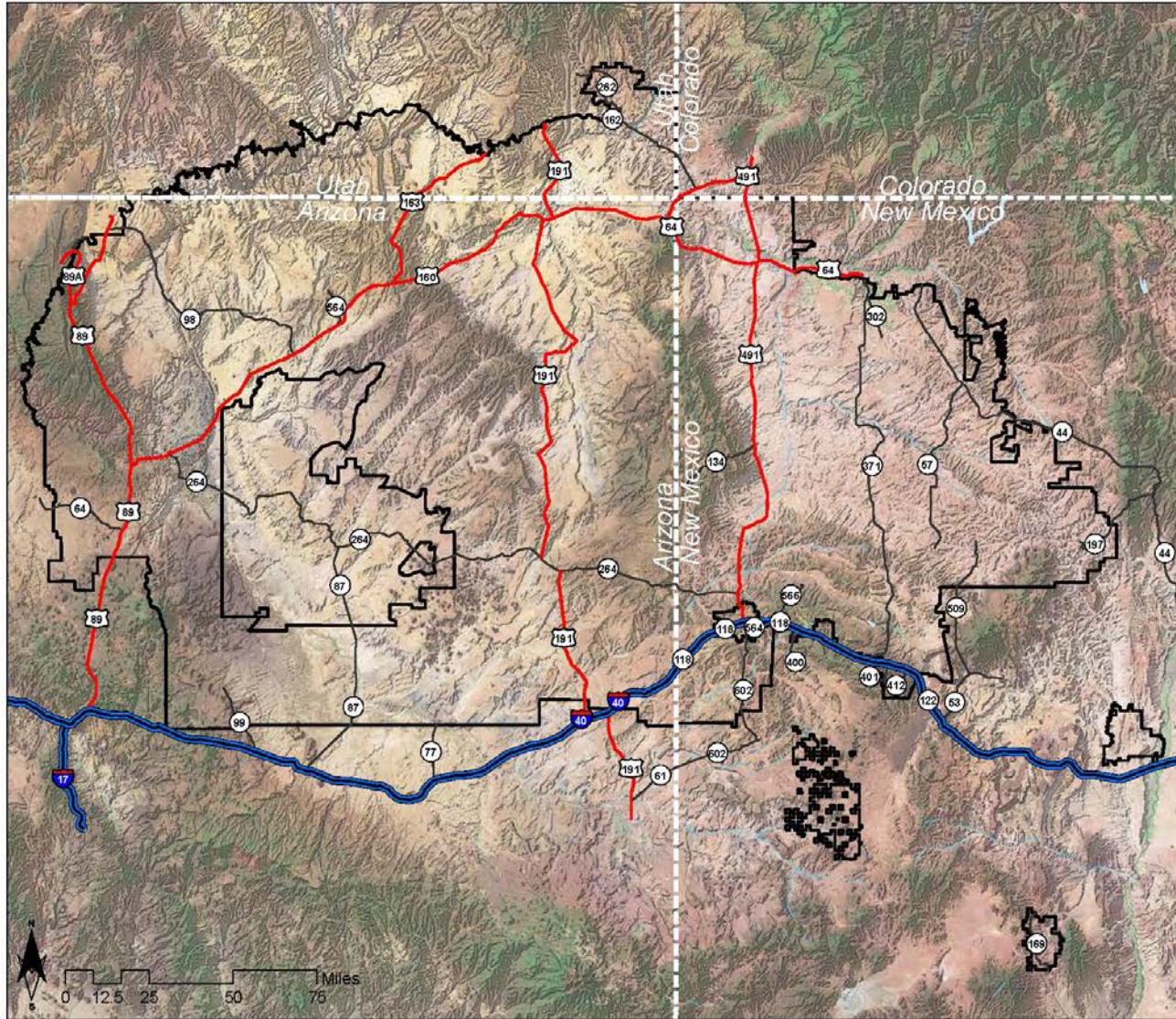


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Figure 4-1| Region Topography



Navajo Nation

Topography

Navajo Nation Boundary

Road Hierarchy

Interstate

US Highway

State Highway

Approximate Elevation (meters)

- 4100-4400
- 3800-4100
- 3500-3800
- 3200-3500
- 2900-3200
- 2600-2900
- 2300-2600
- 2000-2300
- 1700-2000
- 1400-1700
- 1100-1400
- 900-1100
- 600-900
- <600





5.0 EXISTING TRANSPORTATION SYSTEM

The Navajo roadway network consists of 16,317 miles of roads; of these, 5,194 miles are BIA roads, 881 miles are state routes, 816 miles are county routes, and 9,426 miles are Tribal routes. Only 14% of the total roadway network is paved. Table 5-1 summarizes the roadway ownership responsibilities.

Table 5-1| Road Ownership by Mileage

Ownership Entity	Miles of Road	% of System
BIA	5,194	31.8
Tribal	9,426	57.8
State	881	5.4
County	816	5.0
TOTAL	16,317	100

Source: 2020 Official NTTFI Dataset

State DOTs, counties, BIA and Navajo DOT are the primary highway programs to fund and oversee construction and maintenance of the road network.

The roadway infrastructure maintains a hierarchy of functional classifications that relate to the level of regional or local significance the roadway plays. Principal and minor arterials serve a primary function of moving traffic and commerce. These routes should be all-weather Roadways as they have the greatest demands of the system. Major and minor collectors serve a primary function of connecting communities to the arterials for regional mobility. These routes are typically paved or gravel, and some that are lower volume are dirt. Local roads primarily serve local mobility needs and are generally dirt. Furthermore, the connection between road classifications and funding opportunities is important. Different road types are eligible for various funding opportunities (see funding opportunities table). The functional classifications are mapped in Figure 5-1, however they are revisited periodically so the coding in the National Tribal Transportation Facility Inventory (NTTFI) database is the official classification.

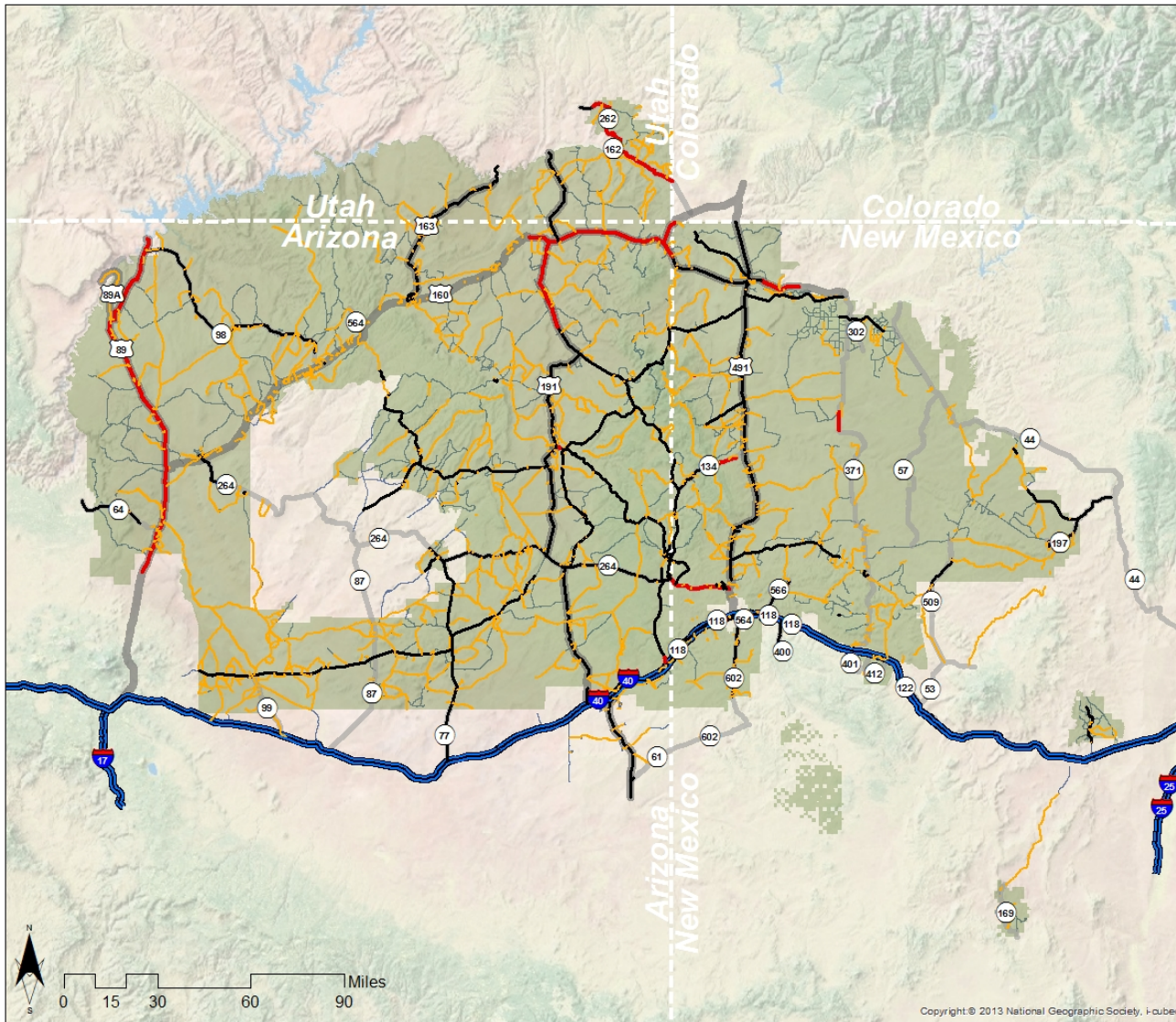


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Figure 5-1| Road Functional Classification



Navajo Nation

Road Hierarchy

- Interstate
- US Highway
- State Highway
- BIA Routes

FHWA Functional Class

- Principal Arterial
- Minor Arterial
- Minor Collector



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5.1 ROADWAY INFRASTRUCTURE

The NTTFI system were compiled using the street classification system the BIA created to identify types of roads. The classes include:

- **Class 1-** Major Arterial: Serves traffic between large population centers and maintain an average daily traffic volume of 10,000 vehicles per day or more with more than two lanes of traffic.
- **Class 2-** Rural Minor Arterial: Provide a connection to smaller towns and communities and generally allow high overall traffic speeds with minimum interference to through traffic movement. Facilitates less than 10,000 vehicles per day.
- **Class 3-** City Local: Streets serving residential areas.
- **Class 4-** Rural Major Collector: Serves as a collector to rural local roads.
- **Class 5-** Rural Local: May serve areas around villages, farming areas, schools, attractions, or various small enterprises.
- **Class 6-** City Minor Arterial: Located within communities and serve as access to major arterials.
- **Class 7-** City Collector: Located within communities and serve as collectors to the city local streets.
- **Class 8-** This class encompasses all non-road projects such as paths, trails, walkways, or other designated types of routes for public use by foot traffic, bicycles, trail bikes, snowmobiles, all terrain vehicles, or other uses to provide for the general access of non-vehicular traffic.

These eight Class Codes were used to generate an inventory of the roads within Navajo Nation. Appendix A calculates the lane mileage of each class of road. In general, there is a direct correlation between funding levels, travel demand, surface type, and functional classification. Navajo DOT is currently working through transitioning the BIA route classifications to using the FHWA Highway Performance Management System (HPMS) functional classifications; however, Navajo DOT is complying with the BIA class codes.

ROADS

Roads within Navajo Nation are owned either by the BIA, the Tribe, the County, or the State. This section summarizes the road miles owned by each entity, associated roadway classifications, and the surface type.

BIA OPERATED ROADS

Within Navajo Nation, the BIA is responsible for 5,194 miles of roads for all road classes. The total miles of BIA operated roads by Agency and by class is listed in Table 5-2 for class codes 1 through 8.

Table 5-2| BIA Operated Roads by Class Code

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Total
Chinle	1.0	222.4	0.7	326.1	51.8	0.0	0.0	0.0	602
Crownpoint	0.0	24.2	6.5	241.2	222.5	2.4	0.0	0.0	496.8
Ft. Defiance	2.0	199.7	0.0	716.3	172.6	0.2	0.0	0.0	1090.8
Shiprock	0.0	120.0	2.8	657.1	511.2	0.0	0.0	0.0	1291.1
Tuba City	0.0	61.4	9.3	742.8	595.6	2.7	1.2	0.0	1413
NIIP	0.0	13.4	0.0	31.5	6.6	0.0	0.0	0.0	51.5
New Lands	0.0	0.0	15.6	43.2	2.1	0.0	0.0	0.0	60.9
Total	3.0	641.1	34.9	2758.2	1562.4	5.3	1.2	0.0	5006.1

NAVAJO OPERATED ROADS

Tribal operated roads account for 9,426 miles of all roads within Navajo Nation (Table 5-3). The Tribe owned roads within Navajo Nation are classified and categorized the same as the BIA owned roads. The vast majority of Tribe operated roads consist of unimproved dirt surfaces.

Table 5-3| Tribal Operated Roads by Class Code

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Total
Chinle	0.0	0.0	2.3	179.3	926.5	2.0	2.7	0.0	1112.8



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Crownpoint	0.0	5.1	5.9	127.1	1101.4	0.4	2.4	0.0	1242.3
Ft. Defiance	0.0	0.0	10.7	98.4	2341.3	10.2	9.2	4.5	2474.3
Shiprock	0.0	0.0	10.8	56.7	2192.7	1.5	0.0	0.0	2261.7
Tuba City	0.0	0.0	3.9	505.7	1374.8	7.4	3.8	0.0	1895.6
NIIP	0.0	13.4	0.0	31.5	6.6	0.0	0.0	0.0	51.5
New Lands	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2
Total	0	18.5	33.8	998.7	7943.3	21.5	18.1	4.5	9038.4

STATE OPERATED ROADS

The state facilities use the FHWA HPMS functional classifications. The majority of State operated roads fall in the principal arterial, minor arterial, major collector and minor collector functional classifications, and primarily provide connectivity between the populated areas, various attractions, and the interstate system.

COUNTY OPERATED ROADS

There are several County operated and maintained roadways servicing populations, industry and businesses within Navajo Nation. Agreements are in place relating to maintenance of those roadways. Agreements exist between the County and BIA when the county is maintaining the roadways.

5.2 BRIDGES

The Tribal Transportation Program (TTP) bridge system includes all bridges on public roads, or providing access to, Navajo Nation lands. When including bridges on state managed roads and highways there are a total of 720 bridges as part of the National Bridge Inventory bridge system within Navajo Nation. This summary is concerned with only the 182 bridges that are owned and maintained by the BIA on BIA and Tribal roadways. The other 538 bridges are County and State DOT bridges that are important to Navajo DOT, but not necessarily in the NNTFI inventory. Historically, a partnership between Navajo DOT and these organizations have taken place.

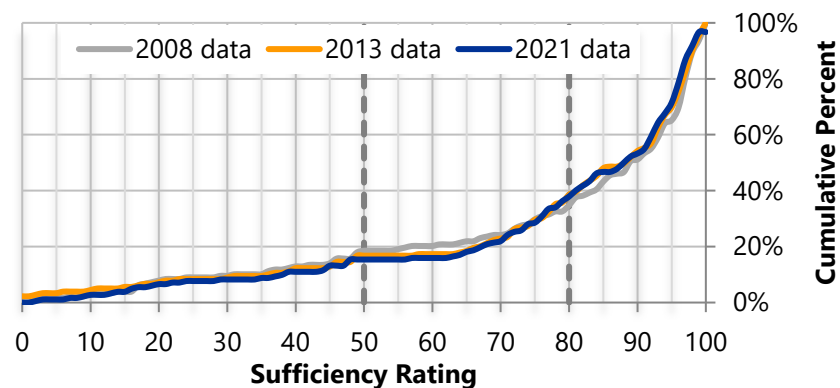
BRIDGE CONDITIONS

Bridge conditions on the tribal bridge system are inspected every two years. As part of the inspection, a condition rating between zero and 100 is calculated for each bridge. To be eligible for rehabilitation, a bridge must be deficient and have a condition sufficiency rating of 80 or less. A functionally or structurally deficient bridge is eligible for replacement when the sufficiency rating is 50 or less. Figure 5-2 illustrates the sufficiency rating for 2008, 2013, and 2021 bridges in the Navajo Nation that are owned and maintained by the BIA.

2008, 2013, AND 2021 CONDITIONS COMPARISON

Figure 5-2 shows the bridge condition sufficiency rating cumulative distribution of all BIA bridges with 2008 data, 2013 data, and 2021 data. The recent data shows nearly 39 percent of bridges are eligible for rehabilitation or replacement. This is slightly more than the number of deficient bridges from years previous, indicating that maintenance has been just short of keeping pace with bridge deterioration.

Figure 5-2| Cumulative Distribution of BIA Bridge Sufficiency Rating from 2008, 2013, and 2021 Data



SIDEWALK WIDTHS ON BRIDGES



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Curb or sidewalk width is an important characteristic of bridges that, though not factored in an overall bridge condition sufficiency rating, is important in affecting mobility and safety of pedestrians and other non-motorized road users. Approximately 40% of the population lives at or below poverty levels, and strongly linked to that, almost 6% of the working population either bicycle or walk to work. Figure 5-3 shows nearly all bridges with shoulders are inadequate for pedestrian and other traffic combined.



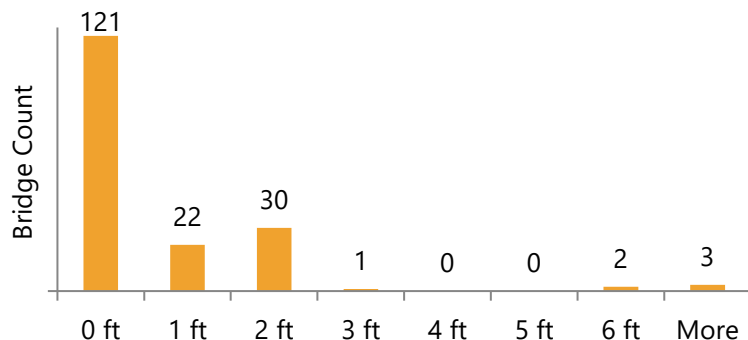
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Figure 5-3| 2013 Curb or Sidewalk Width on Either Side of Bridge



The NTS operates on weekdays between 5:00 AM and 7:00 PM (MST). Communities and Chapters located between the established origin and final destination have access to transit services. Table 5-4 lists the current NTS routes and Figure 5-4 illustrates the routes and Chapters served by transit. Table 5-4 and Table 5-5 list the current and future NTS routes as identified on the NTS website.

5.3 TRANSIT

PUBLIC TRANSIT SERVICE

Within Navajo Nation the Navajo Transit System (NTS) provides service to many of the Chapter communities. Navajo Transit is operated from funds from Administration, Operating and Capital funding under the Section 5311 Rural Public Transportation Program from Arizona, New Mexico and Utah Department of Transportation, Federal Transit Administration (FTA) and the Navajo Nation. They are operated under the direction of the Division of General Services, within Navajo Nation’s government structure. This has resulted in reduced coordination with other Divisions, such as the Division of Transportation. In 2021 (Federal Fiscal Year 2022), it is anticipated that the Navajo Transit System will be transferred under the Division of Transportation. According to the NTS website, the NTS receives Administration, Operating, and Capital funding under the Section 5311 Rural Public Transportation Program from Arizona, New Mexico and Utah Department of Transportation, the Federal Transit Administration (FTA) and the Navajo Nation.

NAVAJO TRANSIT SYSTEM

Navajo Nation operates an independent transit system (NTS), which is run under General Services.



2021 Navajo Nation

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Table 5-4 | Current NTS Routes

Route Number	Origin & Destination
Route 01:	Tuba City, AZ to Ft.Defiance, AZ and return
Route 02:	Steamboat, AZ to Ft. Defiance, AZ and return*
Route 03:	Kayenta, AZ to Ft.Defiance, AZ and return
Route 04:	Crownpoint, NM to Ft.Defiance, AZ and return
Route 05:	Ft. Defiance, AZ to Gallup, NM and return
Route 06:	Crystal, NM to Gallup, NM and return
Route 07-A:	Newcomb, NM to Farmington, NM and Ft.Defiance, AZ and return
Route 07-B:	Newcomb, NM to Shiprock, NM and Farmington, NM and return
Route 08:	Chinle, AZ to Ganado, AZ and Tsaile, AZ and return
Route 09:	Dilkon, AZ to Ft. Defiance, AZ and return
Route 11:	Flagstaff, AZ and Tuba City, AZ and return
Route 12:	Kayenta, AZ to Tuba City, AZ and return
Route 13:	Ft.Defiance, AZ to Crownpoint, NM and Gallup, NM and return
Route 14:	Shiprock, NM to Ft.Defiance, AZ and return
Route 15:	Sanders, AZ to Window Rock, AZ and return
Route 16:	Aneth, UT to Bluff, UT and Blanding, UT and return*
Route 17:	Monument Valley, UT to Bluff, UT and Blanding, UT and return*
Route 18:	Torreón, NM to Cuba, NM and Farmington, NM and return*

*Undefinable time on when services will resume.

Table 5-5| Future NTS Routes

Route Number	Origin & Destination
Route 19:	Forest Lake, AZ to Pinon, AZ and Chinle, AZ and return
Route 20:	Ramah, NM to Gallup, NM and Ft.Defiance, AZ and return

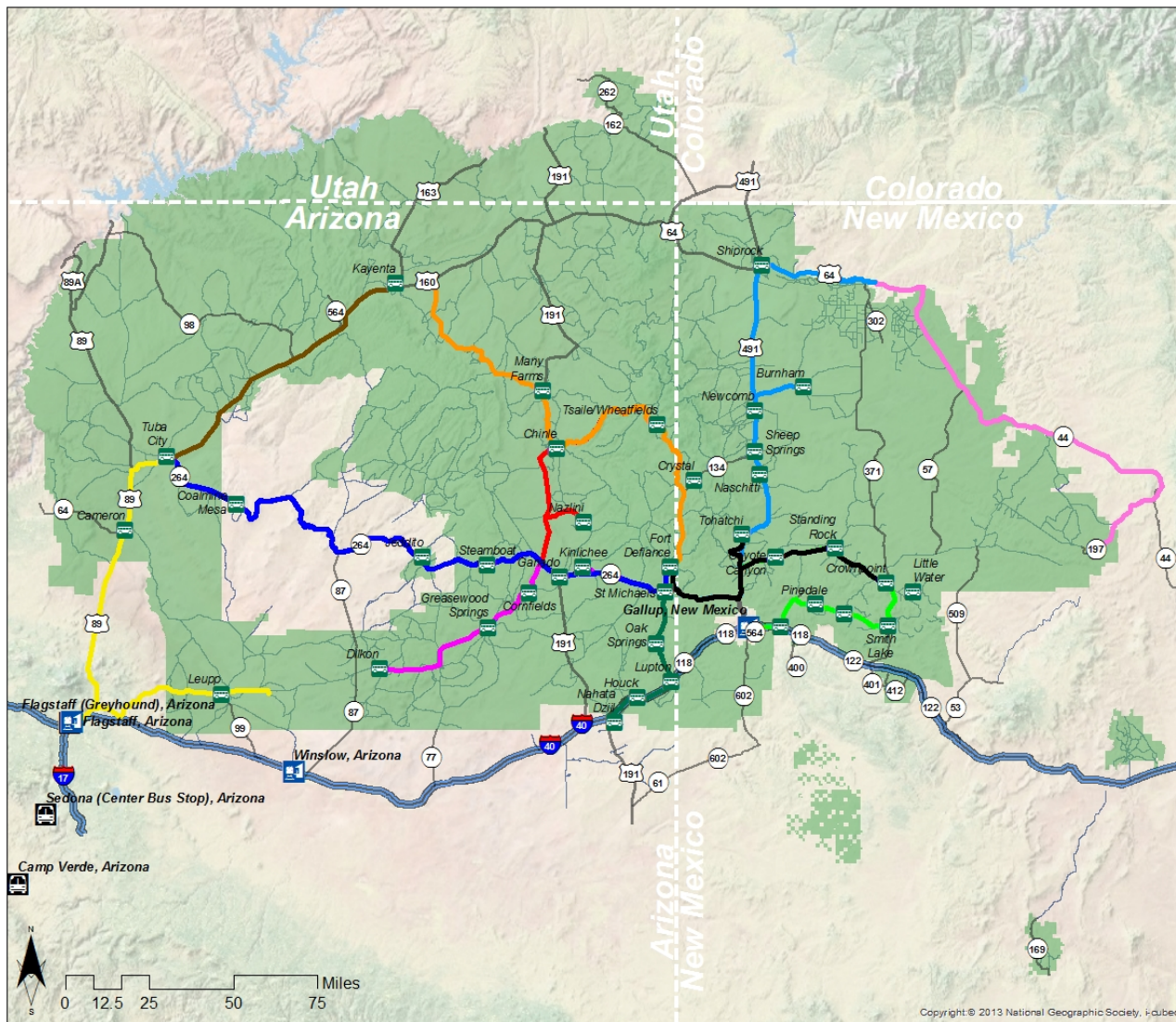


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Long Range Transportation Plan



Figure 5-4| Current NTS Routes



Navajo Nation

Transit

- Chapters Served by Transit
- Greyhound/ Bus Station
- Amtrak/ Passenger Rail Station

Navajo Transit Routes

- Route 1 and 2
- Route 3
- Route 4
- Route 5 and 6
- Route 7 and 14
- Route 8
- Route 9
- Route 11
- Route 12
- Route 13
- Route 15
- Route 18
- BIA Routes



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STATE TRANSIT PLANNING

In 2008 Arizona Department of Transportation (ADOT) completed a Rural Transit Needs Study which identified a need for intercity bus service between Page, Kayenta, Tuba City and Flagstaff. This plan identified these areas as top candidates for new intercity Section 5311 program service. Figure 5-5 illustrates the potential routes identified as proposed service lines from that study. To date, the Tuba City to Page connection is the only route that does not currently have service.

Additionally, the previous 2016 LRTP identified supporting policies and practices including recommended roles, responsibilities and next steps for implementing transit service. The following were identified recommendations for local and tribal governments:

- **Support.** Generate support for rural transit among local residents;
- **Monitor demographics.** Actively monitor demographic changes in jurisdiction that may impact existing or new services;
- **Service coordination.** Identify public transportation services within city/town or Tribal Reservation that promote the efficiency of general public, elderly, and disabled service by supporting the streamlining and coordination of existing public transportation programs; and
- **Planning.** Ensure proper planning and development of operations is provided to meet the needs of the city/town or Tribal Reservation.
- **State and COGs.** The State and COGs should work closely with local and Tribal governments and social service agencies to pool funding resources by region, encourage efficiency, improve service coordination, and consolidate services, if applicable.

The 2016 LRTP also identified Navajo Nation as a top candidate for expanded Section 5311 program service. Expanded 5311 program services were identified for NTS (in Apache, Coconino, and Navajo Counties, as well as portions of New Mexico and Utah).

In 2010 New Mexico Department of Transportation (NMDOT) completed the New Mexico Statewide Public Transportation Plan. This plan provides an overview of both the existing transit system and the need for expanded or improved service.

Figure 5-5| ADOT, Top Candidates for New Intercity Section 5311 Program Service



Source | AZDOT and Cambridge Systematics, Inc.

Utah Department of Transportation's (UDOT) plans and studies do not address transit service within Navajo Nation.

5.4 BICYCLE & PEDESTRIAN FACILITIES

An assessment of proposed bicycle and pedestrian facilities in State plans is important in identifying where the State DOTs can become key partners in implementing these improvements.

BICYCLE FACILITIES

Several highways are identified as bicycle routes in State bicycle plans. In Arizona segments of US-89 and US-160 are identified as bicycle routes. In New Mexico segments of US-64 and US-491 are identified as bicycle routes. Provided in Table 5-6 are summary notes on these routes from the State



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Long Range Transportation Plan



plans. Using only BIA and Tribal Routes Figure 5-6 identifies in green all routes with roadway shoulders greater than 4', indicating a potential network of bike shoulder facilities. In the same way, Figure 5-7 illustrates the surface conditions of all roadway shoulders that are greater than 4'. Improved roadway shoulders on both state and county routes is desired, creating an opportunity for partnerships.

Table 5-6| Identified State Bicycle Routes

State	Highway	Area	From	To	Comments
Arizona	US-160	Tonalea to Tuba City	MP 329+0.76	BIA 021	Effective shoulder width is less than 4 feet. Rumble strips present in some areas.
Arizona	US-160	Tuba City to US 89	US-89	MP 321+0.68	Effective shoulder width is less than 4 feet. Rumble strips present.
Arizona	US-89	Tuba City	MP 469.5	480 (US 160)	While some sections of this segment have been improved, there are still sections without shoulders; US 89 is part of US Bicycle Route System 79.
Arizona	US-89	Tuba City	MP 491.7	494.4	
Arizona	US-89	Tuba City	MP 505.4	512.5	
Arizona	US-89	Tuba City	MP 518	MP 521.2	
New Mexico	US-64	Gallup to CO Border	I-40	Colorado Border	Proposed Bicycle Route
New Mexico	US-491	Farmington to AZ Border	BIA 371	Arizona Border	Proposed Bicycle Route

PEDESTRIAN FACILITIES

Of the State long range transportation plans, only Arizona's plan specifically identified pedestrian facility improvements. Several highways and state routes are identified as sidewalk opportunities in the Arizona plan including a short segment of US-89 and SR-98 that are identified as sidewalk opportunities and were prioritized as a moderate need. Additional summarized details on these pedestrian facility improvements are listed in Table 5-7. The New Mexico state planned listed communities that actively participate in the Safe Routes to School Program. Of the communities within Navajo Nation, only the border communities of Gallup and Farmington were listed.

Table 5-7| Identified Pedestrian Facility Improvements

State	Highway	Area	Street Face	From	To	Sidewalk Need
Arizona	US-89	Page	Both	Industrial Rd.	Dam Access Rd.	Moderate
Arizona	SR -98	Page	Both	US-89 intersection	Coppermine Rd.	Moderate



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Pedestrians on Highway Shoulder



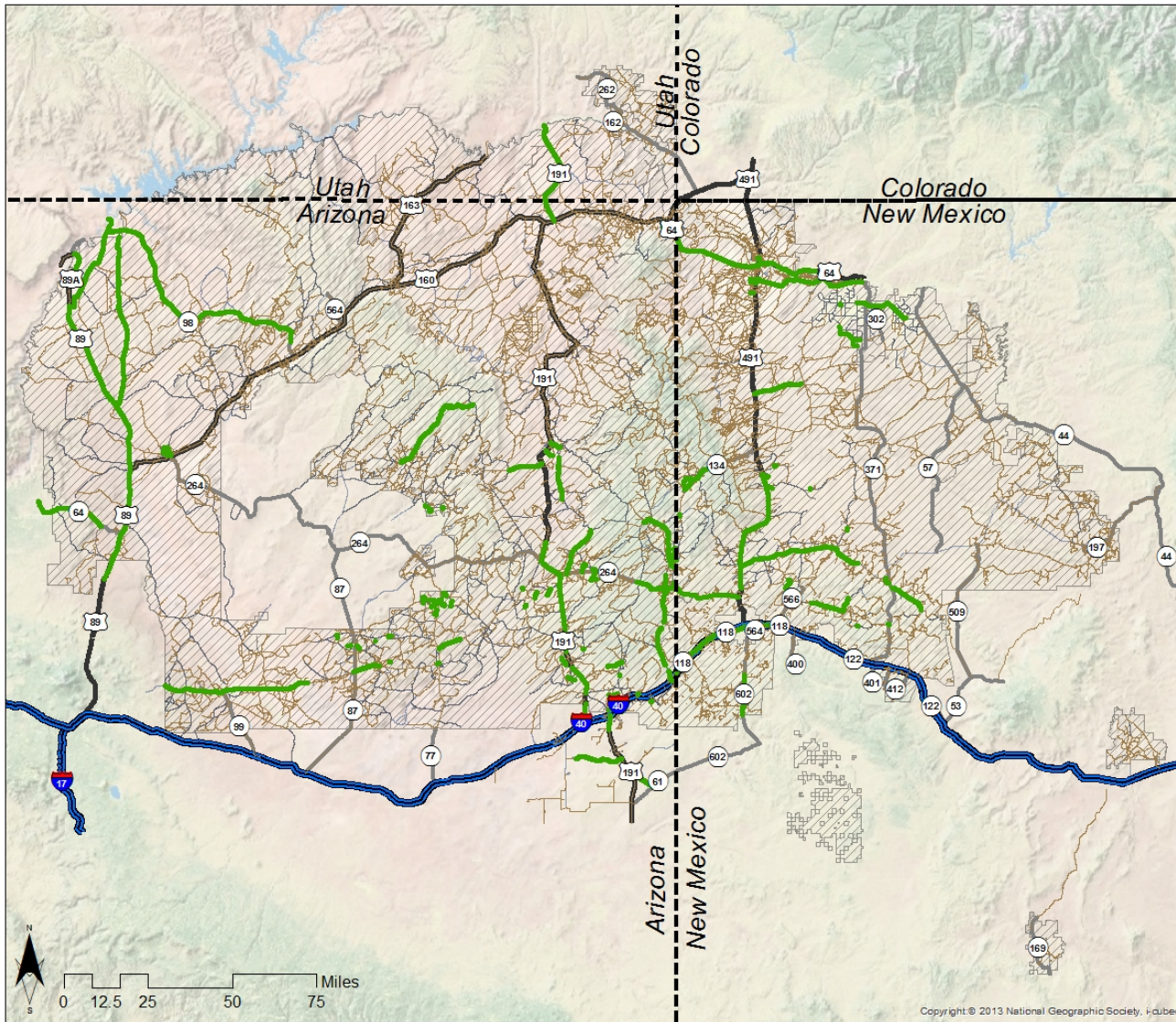
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Figure 5-6| Existing Road Shoulder Width



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Shoulder Condition

- Shoulder Width = 4 ft or greater
- Shoulder Width < 4 ft

Road Hierarchy

- Interstate
- US Highway
- State Highway
- Road
- BIA Routes
- Navajo Nation



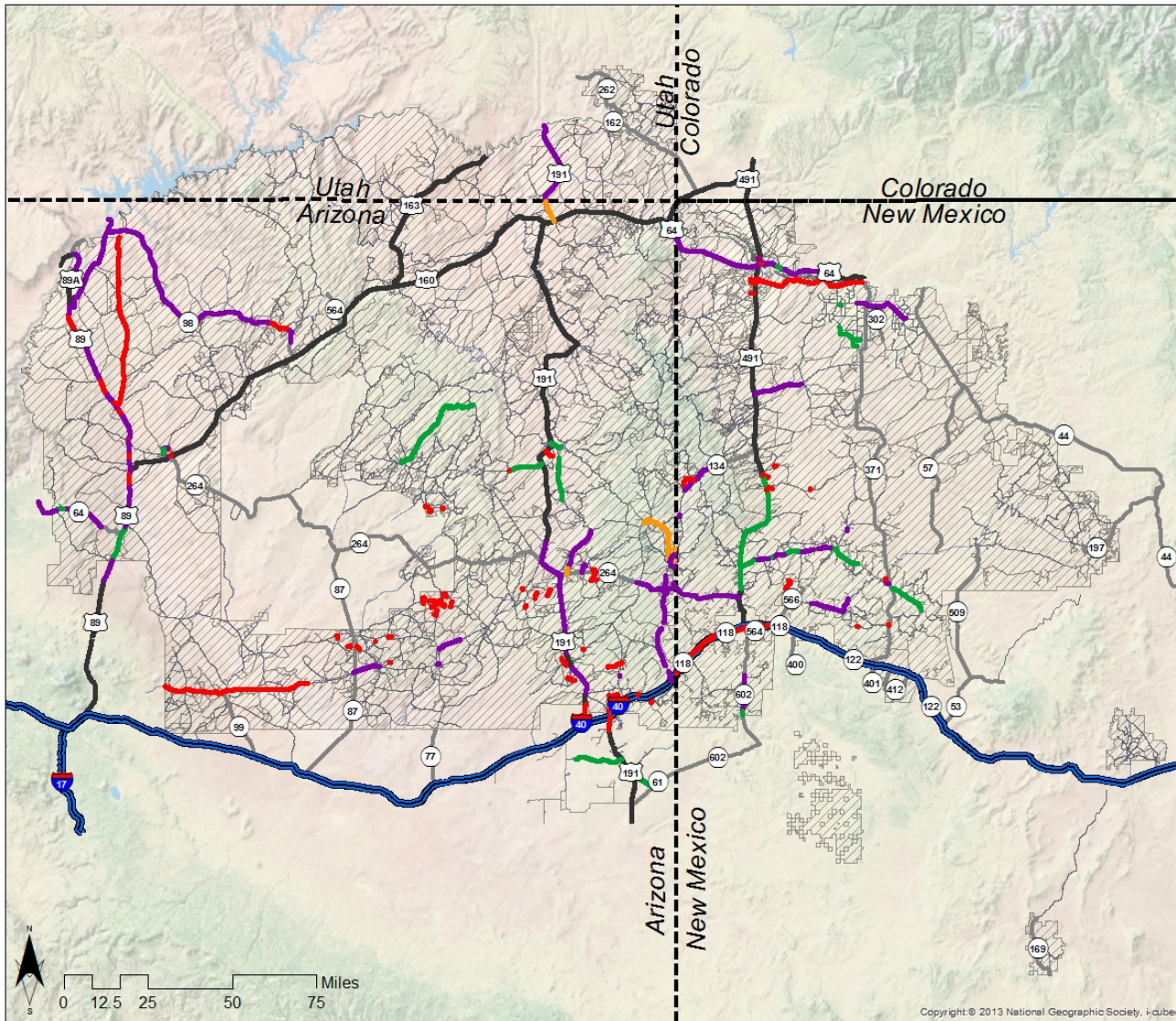


Figure 5-7| Ranking of Shoulder Width Condition



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Navajo Nation

Shoulder Condition

Shoulder Width = 4 ft or greater

- None
- Critical Condition
- Tolerable Condition
- Excellent Condition



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Long Range Transportation Plan



5.5 INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

Regions implementing ITS projects are required to develop a regional ITS architecture consistent with national guidelines and standards. While the states of Arizona and New Mexico have developed strategic ITS plans and defined the statewide framework and architecture for ITS on state managed facilities within Navajo Nation, a regional ITS architecture for the Nation has not been developed. A strategic ITS assessment needs to be conducted for the Navajo Nation to coordinate the efforts of various agencies and stakeholders on the Nation and incorporate existing and planned ITS into an architecture that is consistent and coordinated with state ITS. Coordination of ITS may require intergovernmental agreements with state DOTs and other agencies that are not currently in-place.

The Arizona strategic plan for early deployment of ITS on I-40 was completed in 1997. This activity included the deployment of Highway Condition Reporting System (HCRS), which provides continuous and up-to-date information on roadway and weather conditions to the users. Applications and technologies in the Arizona ITS plan on Navajo Nation lands include Advanced Traveler Information Systems (ATIS) through kiosks and 511 telephone system, Road Weather Information System (RWIS), closed-circuit television (CCTV) cameras, and 21 existing or planned variable-message signs (VMSs). The New Mexico strategic ITS plan has likewise defined a full array of ITS deployments that in-part have been implemented in Navajo Nation. In 2007, when the plan was last published, there were at least seven operational VMSs on state managed roads in the New Mexico portion of the Nation.

The Navajo Division of Transportation created a traffic management center (TMC) to support the emergency management department. The TMC functions as the key technical and institutional hub to bring together the various jurisdictions, modal interests, and service providers to focus on optimizing the performance of the entire surface transportation system. The TMC is located in the Navajo Division of Transportation building in Tse Bonito near the city of Window Rock and monitors at least two CCTV cameras and is equipped to monitor increased ITS infrastructure throughout Navajo Nation. ITS deployments in some parts of Navajo Nation include

portable DMS, signal preemption for tribal public safety vehicles, local and tribal police dispatch, and data communications for construction and maintenance coordination. Expanding use of ITS has also been considered to identify tourism opportunities on tribal lands.

5.6 SAFETY

Safety is an important factor to consider in transportation planning and engineering activities. In MAP-21, there is specific direction to reduce the number and rate of fatal and serious injury crashes. For Navajo Nation, as with many tribes, there are issues with tracking and reporting crashes on the system, which in turn, directly relates to the availability of federal and state funding to mitigate crashes.

5.6.1 NAVAJO NATION STRATEGIC HIGHWAY SAFETY PLAN (SHSP)

Navajo Nation and the Navajo DOT recently completed their Navajo Nation Strategic Highway Safety Plan (SHSP) in 2018 with the help of Wilson & Company. The goal of the SHSP is to establish and understand the existing roadway safety conditions, which provides necessary insights for Navajo Nation in the years to come and ultimately gives guidance on mitigating safety performance measures. The study analyzed crash trends over the entire Navajo Nation, an area over 27,000 square miles and identified stakeholder strategies, emphasis areas, and critical focus areas.

The full SHSP can be located in Appendix L of this plan.

4 E'S OF HIGHWAY SAFETY

The four E's of safety define the broad stakeholders who care about safety and are responsible for making roads safe for all users. These stakeholders provide perspective to the SHSP and include the following:

- **ENGINEERING** – What can be done *physically* to make the road safer?



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- **EDUCATION** – What can be *taught* to encourage good driving behavior?
- **ENFORCEMENT** – What laws can *enforce* poor driving behavior?
- **EMERGENCY MEDICAL SERVICES** – What can be done to *improve* emergency response times and connections to hospitals?

STATE EMPHASIS AREAS

Safety funding for Navajo Nation can be received through direct grand source and state safety programs from Arizona, New Mexico, and Utah.

Some important differences exist between safety emphasis areas and strategies outlined in individual state SHSP plans that will impact how safety funding can be obtained. Table 5-8 identifies emphasis areas that are designated in the state SHSP's for Arizona, New Mexico, and Utah. Many of the categories are common between all three states.

The top three priorities amongst all three state safety plans include:

1. Speeding/ Aggressive driving
2. Impaired driving
3. Distracted driving.
4. Distracted driving.

Understanding these emphasis areas allows agencies within their respective states to pursue Highway Safety Improvement Program (HSIP) funding which is used to help implement the strategies outlined in the SHSP. Since each state has different SHSP emphasis areas, it is also important to understand where the various transportation safety funding programs can be used, with engineering, education, enforcement, and emergency service provider improvements to improve roadway safety conditions.

Table 5-8| Arizona, New Mexico, and Utah State Emphasis Areas

State Emphasis Areas			
	Arizona	New Mexico	Utah
Speeding/Aggressive Driving	X	X	X
Impaired Driving	X	X	X
Distracted Driving	X	X	X
Intersection Crashes		X	X
Motorcycles	X		X
Lane Departure Crashes		X	X
Occupant Protection (Restraints)	X	X	X
Nonmotorized Users (Bike/Ped)	X		X
Public Info/Education		X	X
Age Related	X	X	X
Traffic Records/ Data Improvements	X	X	
Policy Initiatives	X		
Drowsy Driving			X
Emergency Services Response		X	
Infrastructure and Operations	X		
Native Americans		X	
Heavy Vehicles/Transit	X		
Natural Risks	X		
Special Users		X	
Traffic Incident Management	X		
Interjurisdictional	X		



2021 Navajo Nation

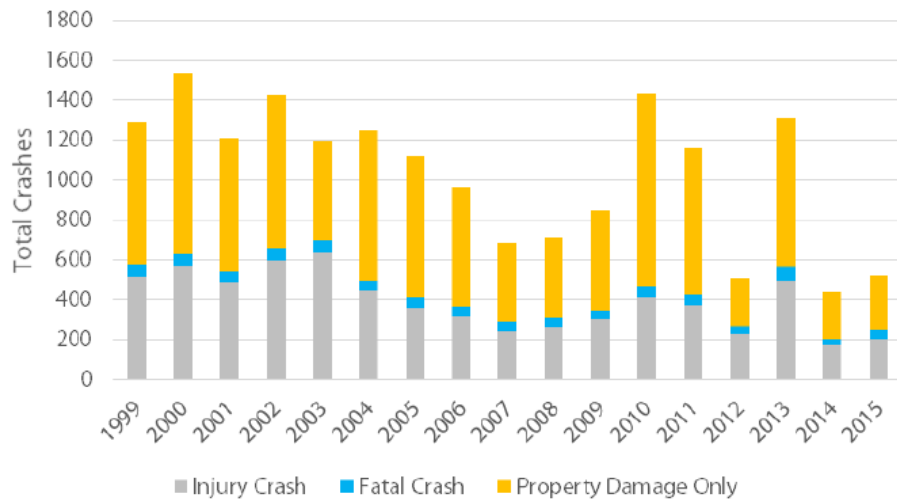
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CRASH DATA ANALYSIS

As depicted in the 2018 SHSP (Appendix L), 17 years of crash data (1999 - 2015) was obtained through Navajo DOT and included Arizona, Utah, and New Mexico state highway crash data. The total number of documented crashes - which included fatal, injury and property damage only- that occurred within Navajo Nation was 17,717 over the course of 17 years. 134 of the total crashes, did not have a year associated with the data and were omitted for this analysis. Therefore, the total crash count used for this analysis was 17,583 crashes. Figure 5-8 displays these crashes by severity.

Figure 5-8| Crash Severity in Navajo Nation



CRITICAL GEOGRAPHIC FOCUS AREAS

The crash data was queried to display locations of serious and fatal injury crashes. Geospatial analysis was used to understand crash density per square mile, which resulted in seven distinct areas exhibiting the highest density (Figure 5-9). These seven locations represent the following characteristics, even though they comprise only 4.1 % of Navajo Nation road mileage:

- Where crashes have a Cause or Collision type code (17, 17) of pedestrian involved (Cause - 17, Collision - 17), 70% of crashes comprised of this type;
- Where crashes have a Junction type crash code of 2 (intersection related crashes), 63% of crashes comprised of this Junction type;
- Where crashes have a Cause type of 3 (Failed to Yield Right-of-Way), 79% of crashes comprised of this type; and
- Where crashes have a Cause or Collision type code (13, 13) of wildlife or animal involved, 37% comprised of these crash types.

The seven critical zone areas include:

1. Shiprock Area
2. Window Rock
3. Tuba City
4. Kayenta Area
5. Chinle Area
6. Ganado Area
7. Newcomb Area

Figure 5-9 reveals the seven concentrations of fatal and injury crashes, a focus at the state and federal level. Moreover, each area was looked at independently as to comprehend unique or common crash factors resulting in high densities of crashes.



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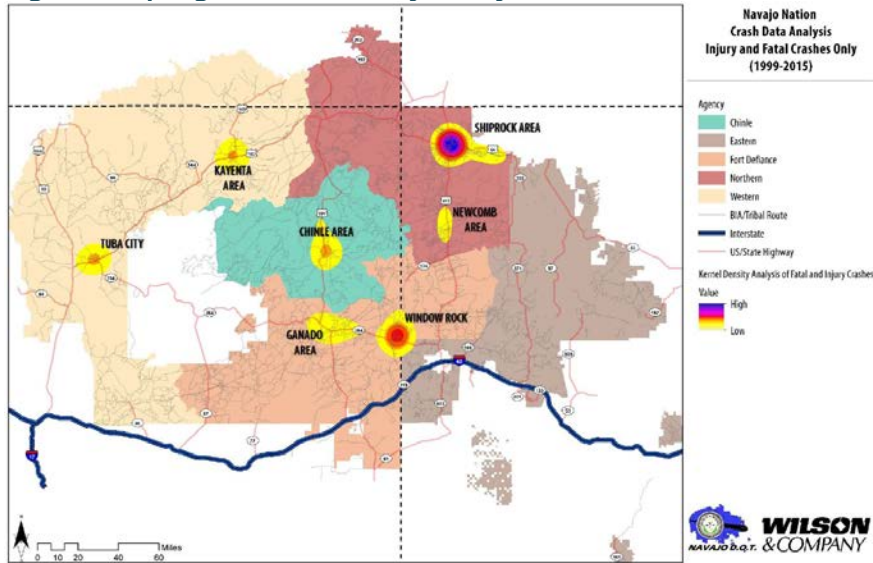
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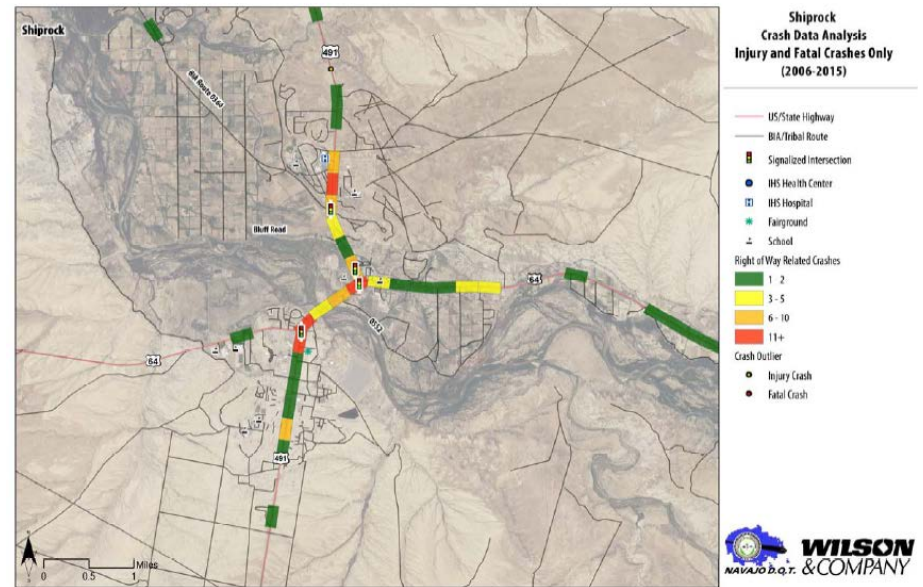
Cause and collision types describe the nature of each crash incident, therefore the three most prevalent cause and collision types are stated for each emphasis areas which helps identify specific issues.

Figure 5-9| High Crash Density Analysis Areas



An intensive analysis process was conducted for critical focus area. Crashes were summarized by various factors location, type, severity, weather/light condition, and other potential related issues. As shown in Figure 5-11, the analysis can be used to better understand trends by category or location. All of the tabular data, charts, and density maps can be found in the appendix items of the Navajo Nation SHSP (See Appendix L).

Figure 5-10| Shiprock Area Right-of-Way/Yield Related Crashes



Areas on the highway network that were not included in the seven focus areas were also addressed through a corridor focused crash analysis. As depicted in Figure 5-10, the density of severe fatal and injury crashes were mapped in order to understand patterns and opportunities for corridor based



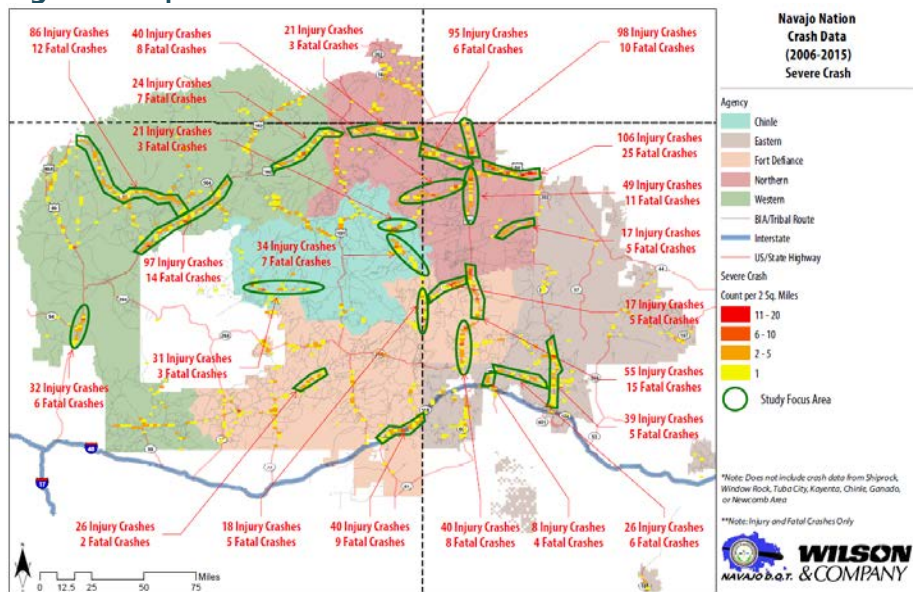
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improvement strategies. US-64 and US-491 outside of Farmington, NM were among the highest severe crash corridors. In addition to this, Appendix L contains the corridor level crash analysis by crash type.

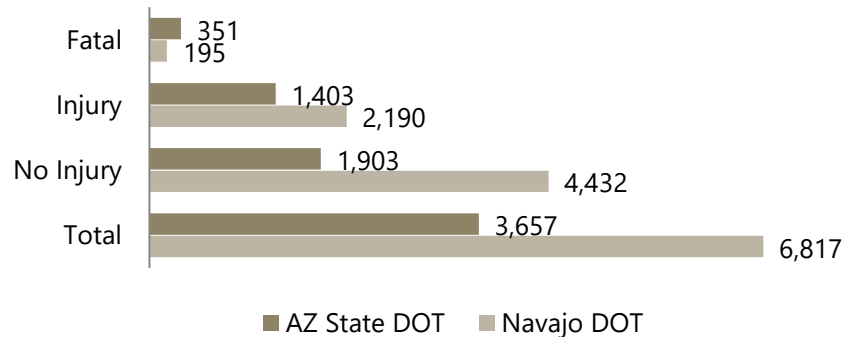
Figure 5-11| Severe Corridor Crash Densities



UNDER-REPORTING OF CRASHES

Navajo Nation roadways exist in the states of Arizona, New Mexico, and Utah. Each of these states maintain record of motor vehicle crashes from crash reports submitted by municipal, tribal, county, or state police agencies. The Navajo Nation also maintains record of the same crashes across all three states. Coordination between police agencies, Navajo DOT, and state DOTs in reporting and sharing crashes records is often incomplete and many crashes go unreported. Significant differences, therefore, exist between the Tribal and State databases of crash records as demonstrated in Figure 5-12 relating to Arizona.

Figure 5-12| Count of Crash Records from State and Tribal Databases for Arizona - Years 2008-2012



Tribal community participation in sharing crash data with states is optional by right of tribal sovereignty and, even when sharing agreements are in place, coordination of records can be difficult. Two observations are clear from Figure 5-12, where crash count comparisons for the Arizona portion of Navajo Nation are shown. First, close to half of the crash records for the Arizona portion of the Nation have not been shared between tribal and state transportation agencies. Second, and slightly less obvious, is that crash records for a portion of all crashes are not being submitted at all. When police crash reports are not available, the federal FARS database will rely on information from EMS and even hospital records in accounting for fatalities, and the state database will ultimately reflect the same fatalities being reported in FARS. However, almost 45 percent of these fatal crashes over the eight-year period are not reflected in the database of crash records for the Navajo DOT suggesting that, for these crashes, a crash report may have never been collected. Underreporting of crashes is more significant as crash severity decreases and so it's expected that an even higher portion of injury and no-injury crashes are missing.





DISTRIBUTION OF CRASHES BY SEVERITY, OWNERSHIP & AGENCY

Several police agencies for Navajo Nation are evaluating transitioning to the Traffic and Criminal Software (TraCS) Program electronic reporting of crashes and this is expected to have an impact in increasing crash reporting. Navajo DOT is also currently involved in a GIS data integration and analysis pilot study that will in part result in easier sharing of crash data between the Navajo DOT and the Arizona and New Mexico DOTs. Figure 5-13 illustrates the Police Districts throughout Navajo Nation.

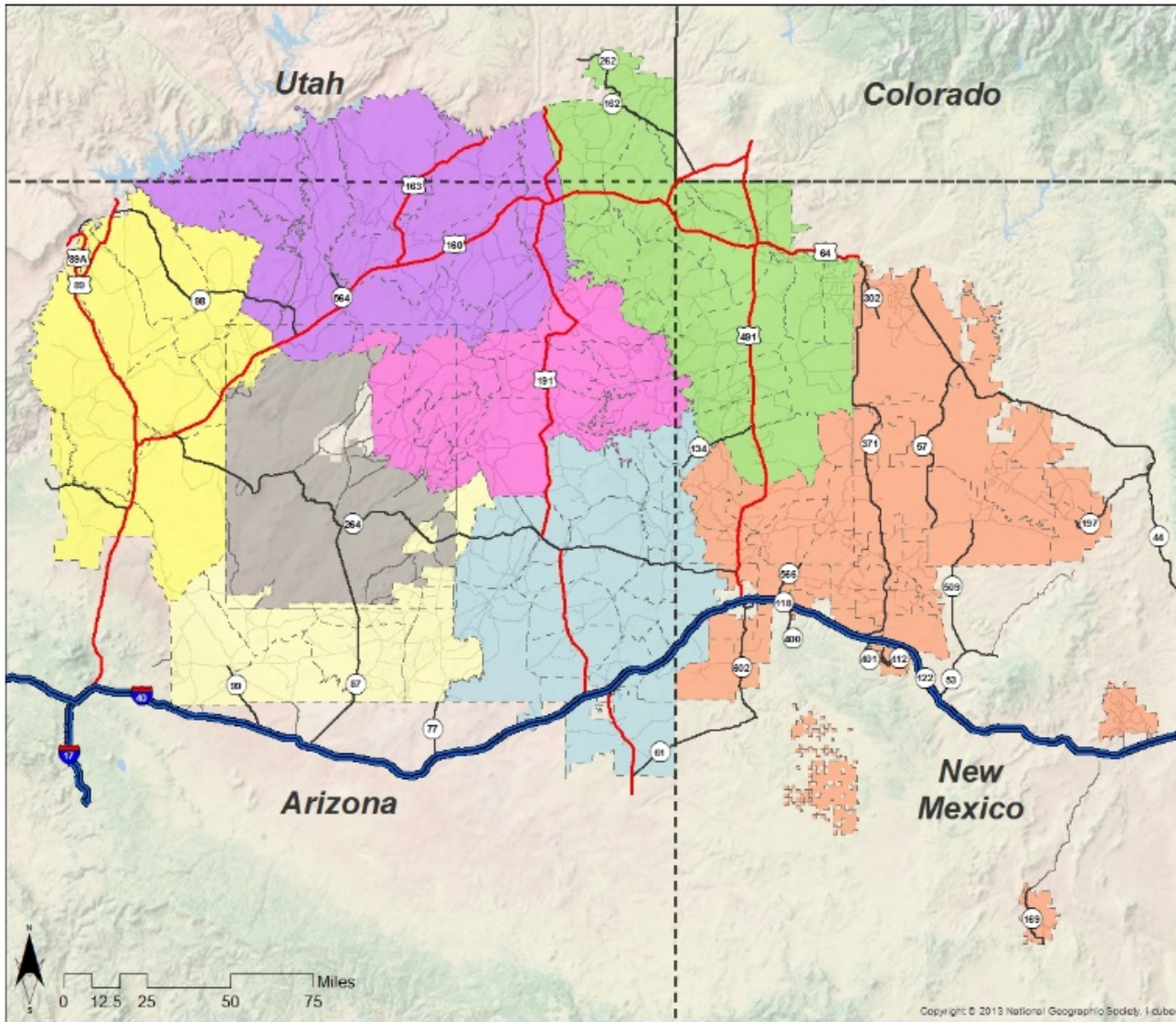


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Figure 5-13| Police Districts



Navajo Nation

Police Districts

- Crownpoint
- Shiprock
- Dilkon
- Chinle
- Tuba City
- Kayenta
- Window Rock

* See table 1.1 for Chapter names



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5.6.2 STATEWIDE SAFETY PLANS (SAFETY TOOLKIT)

Safety funding for the Navajo Nation may be received through state safety programs from Arizona, New Mexico, and Utah. Some important differences exist between safety emphasis areas and strategies outlined in individual state Strategic Highway Safety Plans (SHSP) that will impact how safety funding can be obtained. Arizona has just completed their 2014 SHSP update and New Mexico is currently in the process of updating the previous 2010 SHSP. The Utah SHSP has most recently been updated in 2013.

Table 5-9 identifies emphasis areas that are designated in each of the three state SHSPs, many of which are common between all three or two states.

Understanding these emphasis areas allows agencies to pursue Highway Safety Improvement Program (HSIP) funding which is used to help implement the strategies outlined in the SHSP. Since each state has different SHSP emphasis areas, it is also important to understand where the various safety funding programs can be used, with engineering, education, enforcement and emergency service provider improvements to improve safety conditions.

Table 5-9| Safety Emphasis Areas by State SHSP

Emphasis Area Category	State SHSP
Speeding and Aggressive Driving	AZ, NM, UT
Safety Restraints or Occupant Protection	AZ, NM, UT
Alcohol-Related or Impaired Driving	AZ, NM, UT
Lane Departure Crashes	AZ, NM, UT
Intersection Crashes	AZ, NM, UT
Pedestrian Safety	AZ, NM, UT
Bicycle Safety	AZ, NM, UT
Motorcycles	AZ, NM, UT
Young Drivers	AZ, NM, UT
Older Driver Safety	AZ, NM, UT
Distracted Driving	AZ, NM, UT
Truck and Bus Safety	AZ, UT
Railroad Crossing Safety	AZ, UT
Work Zone Safety	AZ, UT
Traffic Records or Data	NM, UT
Fatigued/Drowsy Driving	NM, UT
Public Outreach and Education	NM, UT
Emergency Services Response	NM, UT
Traffic Incident Management	AZ
Interjurisdictional Coordination	AZ
Natural Risks (Weather and Animal)	AZ
Native Americans	NM
Judicial System	UT
Child Safety	UT



2021 Navajo Nation

Long Range Transportation Plan



Emphasis Area Category	State SHSP
Rural Local Road Safety	UT
Transit System Safety	UT
Rural Local Road Safety	UT

5.6.3 SAFER TRIBAL COMMUNITIES TOOLKIT

According to the Centers for Disease Control and Prevention (CDC) website, motor vehicle traffic collisions are the leading cause of death for American Indian people aged 1-44. Children (ages 0-12) and adult men (ages 20 and higher) have disproportionately higher rates of death due to motor vehicle crashes due to low seat belt use, and alcohol impaired driving. In 2019, the National Highway Traffic Safety Administration (NHTSA) and the Bureau of Indian Affairs Indian Highway Safety Program (BIAIHSP) indicated that only 77% of vehicle users in Indian Country used seatbelts, which is significantly lower than the national average (91%). Also, American Indians have the highest alcohol-impaired driving death rates (2 to 17 times higher) among all racial and ethnic groups.

The CDC website has created a Best Practices Guide (2016) and several “Fact Sheet” resources that have detailed information about issues specific to Native American vehicular fatality rates, as well as tips on how to prevent such occurrences. This information can be found at <https://www.cdc.gov/transportationsafety/native/factsheet.html>.

5.7 FREIGHT

Many of the U.S. highways and State highways that run through and near Navajo Nation are identified as Freight Truck Routes. The U.S. highways identified as truck routes include: I-17, I-40, US-64, US-89, US-160, US-163, US-191, and US-491. The State highways identified as truck routes include: AZ-61, AZ-64, AZ-77, AZ-87, AZ-98, AZ-264, NM-44, NM-53, NM-57, NM 264, NM-371, NM-566, NM-602, UT-162, and UT-262. These routes are mapped in Figure 5-14.

RAILWAYS

There are six different railways that navigate through or near Navajo Nation. These railways are mapped in Figure 5-14 and described below:

- **Apache Railway:** The 38-mile mainline Apache Railway is located outside of Navajo Nation and runs south from Interstate 40. The railway is used to connect a newsprint plant near Snowflake with the BNSF Transcon Corridor at Holbrook. An additional seven-mile branch line links Snowflake with the mainline; service on the branch line is as needed.
- **Black Mesa & Lake Powell Railroad:** The 78-mile Black Mesa and Lake Powell Railroad is located in the northwest portion of Navajo Nation and is not connected with any other railroad; it is used to haul coal from a strip mine at Black Mesa (near Kayenta) to the Salt River Project Navajo Generating Station (near Page). The railroad is jointly owned by Navajo Nation and the Hopi Tribe and has a fenced right-of-way.
- **Burlington Northern & Santa Fe Railway:** The BNSF Railway is categorized as a Class I Railroad. The Transcon line (Gallup Subdivision) runs east-west along the Interstate 40 corridor and includes several lines that run north and south off of the Transcon line including the Defiance Branch which runs northwest of the City of Gallup. The Transcon line also operates with Amtrak service with a stop located in the City of Gallup.
- **Escalante-Western Railway:** The Escalante-Western Railway is categorized as a private railroad. This 55-mile line runs northeast out of the City of Thoreau branching off the BNSF Transcon line to serve the Lee Ranch Mine, El Segundo Mine, and Escalante Generating Station that connects with the BNSF Gallup Subdivision at two locations near Prewitt, New Mexico.
- **Navajo Mine Railroad:** The Navajo Mine Railroad is categorized as a private railroad. This 13-mile line is located southwest of Farmington, New Mexico and is used to transport coal from the Navajo Mine to the Four Corners Power Plant.



2021 Navajo Nation

Long Range Transportation Plan



- **United States Gypsum Railway.** The United States Gypsum Railway are small private rail lines that operate off of the BNSF main line to connect to gypsum quarries.

designed to handle the heavy truck activity which creates surface quality issues.

STATE RAIL PLANS

In 2011, ADOT completed the Arizona State Rail Plan which identified several improvements in Navajo Nation including a proposed new South Mesa Rail Line that runs from the Kayenta Mines south to the BNSF Transcon line, serving coal mine operations. Additionally, two identified "Corridors of Opportunities" pass through the Navajo Nation including:

- Arizona Spine: a north to south corridor through the central part of the State which focuses on Passenger Rail opportunities to support the emerging Sun Corridor and the tourism industry. Although the Arizona Spine Corridor runs into the Navajo Nation, all identified opportunities occur south of Flagstaff.
- Route 66 Corridor: an east to west corridor generally following the cross country transportation corridor consisting of the BNSF Transcon Corridor and Interstate 40. This corridor focuses on network enhancements to move people and goods within Northern Arizona and across the country.

In 2013, NMDOT completed the New Mexico State Rail Plan. This plan identifies several improvements in the Navajo Nation area including:

- Freight Rail from Gallup to Farmington (Facilities and Operations Improvement); and
- Gamerco Logistics Hub (Facilities and Operations Improvement); and
- Navajo Energy Hub at Thoreau.

WEIGHTS & MEASURES

Navajo Nation and the Navajo DOT should partner with state agencies in Arizona, New Mexico and Utah to develop and administer a weights and measures program in Navajo Nation. The tribal and BIA routes are not



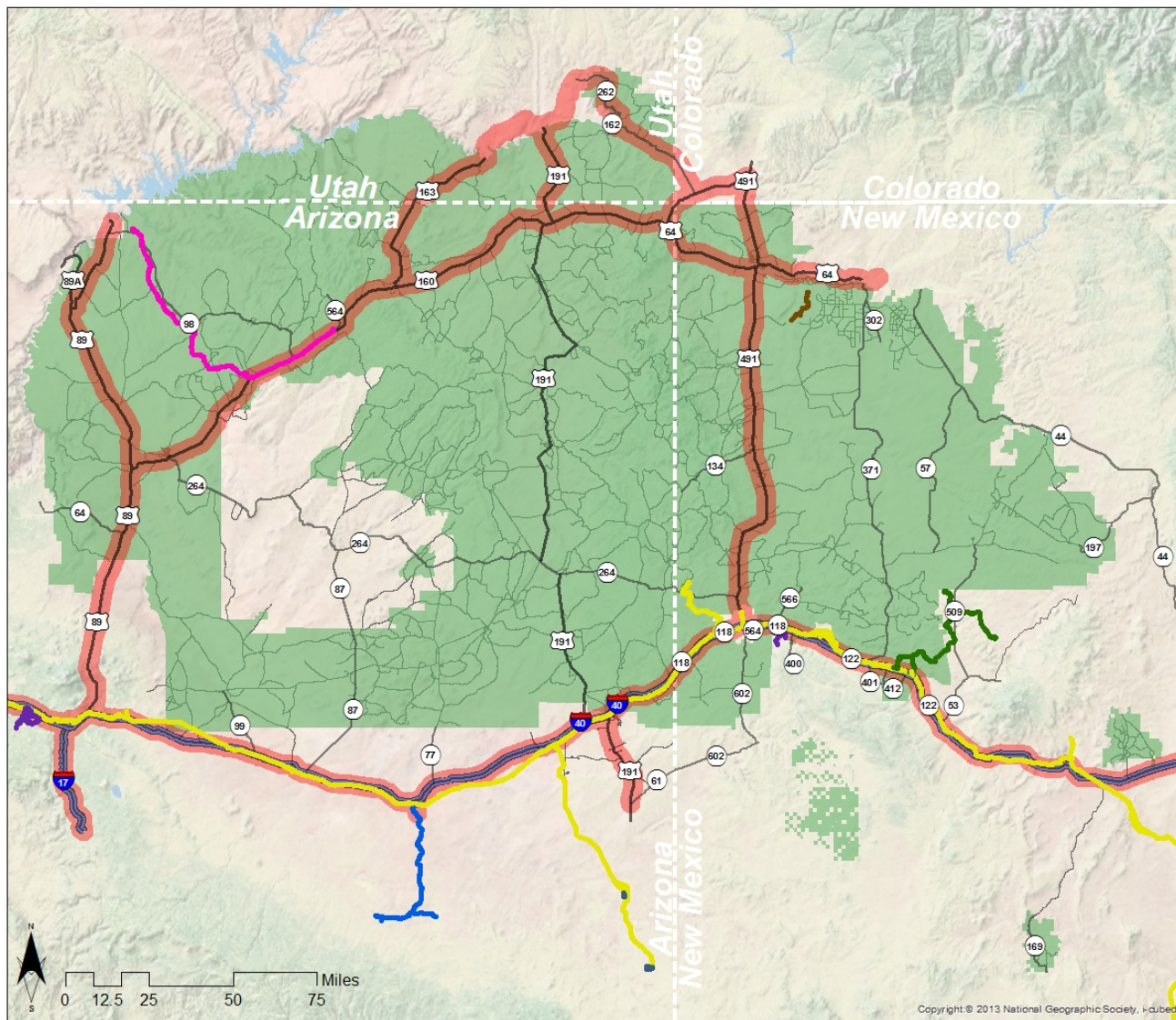
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Figure 5-14| National Freight Rail and Roadway Corridors



Navajo Nation

Rail Corridors

- Apache Railway
- Black Mesa & Lake Powell Railroad
- Burlington Northern & Santa Fe Railway
- Escalante-Western Railway
- Navajo Mine Railroad
- Platte Valley Trolley Railway
- United States Gypsum Railway

Road Hierarchy

- Interstate
- US Highway
- State Highway
- BIA Routes
- National Network Truck Route



2021 Navajo Nation

Long Range Transportation Plan



5.8 AIRPORTS

The data provided for in this section was taken from the Navajo Nation Airport System Master Plan (NNASMP) published January 2016, and the Airports Management Presentation presented by Jonah Begay in October 2020. Navajo DOT worked to develop the NNASMP to identify improvements focused on airports within the Navajo Nation that were included in the Federal Aviation Administration’s (FAA) National Plan of Integrated Airport Systems (NPIAS). As part of the LRTP, the NNASMP will be included by reference so as updates are performed, the LRTP will remain current.

There are 32 airports/airstrips within Navajo Nation. Although there are 32 airports/airstrips within Navajo Nation, the NNASMP focused on five airports within the Navajo Nation which are located in Arizona and New Mexico. Figure 5-16 illustrates the public and private airports in or near Navajo Nation.

The five Navajo Nation airports included in the NNASMP study include:

- Chinle Municipal Airport
- Tuba City Airport
- Window Rock Airport (located in Arizona)
- Crownpoint Airport
- Shiprock Airstrip (located in New Mexico).

A matrix outlining proposed development was created which described recommended upgrades for each of the five airports. Each of the airports had identical recommendations for improvements, although the priority in which they are recommended differs per airport. Some of the proposed recommendations include:

- Reconstruct runways
- Upgrade/install airfield lighting
- Upgrade/install new visual navigational aids
- Install automated weather observation systems
- Upgrade perimeter fencing

- Construct maintenance building, hangers, and wash racks
- Install fueling systems

Three scenarios were created which help to showcase probable funding sources, associated costs, and timelines for completion. Figure 5-15 illustrates funding scenarios and associated costs.

Figure 5-15| Funding Scenarios and Associated Costs

Funding Scenarios and Associated Costs		
Scenario 1 Navajo Nation Funding: Full GA Airport Build out of All Improvements (All Airports)	Improvements (2015-2016) <ul style="list-style-type: none"> • Reconstruct runways, taxiways, and apron • Install/upgrade lighting, signage, and visual aids • Construct fuel facilities • Construct snow removal equipment and building • Install fencing and access control 	Unfunded needs after 2017: \$0
Scenario 2 Navajo Nation Funding: Initial Runway/Visual Aid Improvements (All Airports) Additional Funding Sources: Remaining Improvements (All Airports)	Improvements (2015-2016): <ul style="list-style-type: none"> • Reconstruct runways • Install/upgrade lighting, signage, and visual aids Improvements (2017-2025): <ul style="list-style-type: none"> • Reconstruct taxiways and apron • Construct fuel facilities • Construct snow removal equipment and building • Install fencing & access control 	Unfunded needs after 2025: \$25 million
Scenario 3 Navajo Nation, FAA, and State Funding (One Airport Every 3 Years)	Improvements (2016, 2019, 2022, 2025, 2028): At <u>one</u> airport: <ul style="list-style-type: none"> • Reconstruct runway • Install/upgrade lighting, signage, and visual aids • Install fencing and access control 	Unfunded needs after 2028: \$34 million



2021 Navajo Nation

Long Range Transportation Plan



5.8.2 FEDERAL IDENTIFICATION

The FAA produces an airport facility directory that lists all open-to-the-public airports, seaplane bases, heliports, military facilities, and selected private use airports. The directory lists six airports located within Navajo Nation including:

- Navajo Mountain Airport (Utah)
- Chinle Municipal Airport (Arizona)
- Kayenta Airport (Arizona)
- Tuba City Airport (Arizona)
- Window Rock Airport (Arizona)
- Shiprock Airstrip (New Mexico)
- Crownpoint Airport (New Mexico)

There are no airports recognized in this directory for Utah, except for Kayenta Airport which was not studied in the NNASMP. All other federally identified airports are addressed in the NNASMP.

5.8.3 STATE IDENTIFICATION

The Navajo Nation airports that are identified in each State Department of Transportation aviation system plan include:

- Tuba City Airport (Arizona)
- Kayenta Airport (Arizona)
- Chinle Municipal Airport (Arizona)
- Window Rock Airport (Arizona)
- Ganado Airport (currently closed) (Arizona)
- Rock Point Airport (Arizona)
- Shonto Airport (Arizona)
- Pinon Airport (Arizona)
- Lukachukai Airport (Arizona)
- Rocky Ridge Airport (Arizona)
- Pine Springs Airport (Arizona)
- Shiprock Airstrip (New Mexico)
- Crownpoint Airport (New Mexico)
- Oljato Airstrip (Utah)

5.8.4 NAVAJO NATION CLASSIFICATION

Navajo Nation recognizes 32 airports/airstrips, classified as either primary or secondary airports.

PRIMARY AIRPORTS

Primary airports are airport which are located within primary growth centers and open to public use. Typically, public use includes emergency medical transportation, tribal business, or occasionally use by tourists. The primary airports include:

- Chinle Municipal Airport (Arizona)
- Ganado Airport (currently closed) (Arizona)
- Kayenta Airport (Arizona)
- Tuba City Airport (Arizona)
- Window Rock Airport (Arizona)
- Crownpoint Airport (New Mexico)
- Shiprock Airstrip (New Mexico)
- Oljato Airstrip (Utah)

Between 1998 and 2003 the Shiprock Airstrip, Tuba City Airport, Crownpoint Airport, and Chinle Municipal Airport were constructed in addition to considerable facility improvements at the Kayenta Airport. Although currently closed, the Ganado Airport is planned to re-open in 2015 and will primarily be used for emergency medical transportation. Window Rock Airport had minor improvements in 2009 and is used for transportation of the Navajo Nation President, tribal officials, and private service.



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Figure 5-16| Private & Public Airports



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SECONDARY AIRPORTS

Within Navajo Nation there are twenty secondary airports that typically consist of unpaved/dirt runways and do not have support facilities. Many of these airports are in poor condition and are closed unless used for medical emergencies or emergency landings. There are six secondary airports in the Arizona State Aviation System Plan (ASASP) including:

- Rock Point Airport
- Shonto Airport
- Pinon Airport
- Lukachukai Airport
- Rocky Ridge Airport
- Pine Springs Airport

Of the remaining secondary airports none are included in New Mexico's or Utah's state aviation system plans. There are also four privately owned and maintained airports, they include:

- Goulding's Airport
- Thoreau Airport
- Klagetoh Airport
- Black Mesa Airport

PROPOSED AIRPORTS

There are currently three proposed airports being studied to expand aviation services in northern and southern Navajo Nation, including:

- Twin Arrows near Flagstaff, Arizona;
- Red Mesa in Utah, near Four Corners; and
- Ramah in New Mexico, southeast of Gallup.

HELIPADS

As communities identify aviation related needs, helipads have become a lower-cost method to initiate and provide critical aviation services. Current helipads in operation include a BIA / Fire Department at the Window Rock

airport, the Four Corners Regional Health Center, and a helipad at the Newcomb Chapter. Figure 5-16 depicts the Helipad System Plan.

Currently, there are five helipads that are being examined, including:

- Cove Chapter
- Beclahbito Chapter
- Sanostee Chapter
- Pinon Chapter
- Dennohotso Chapter

For a community to identify the potential for aviation related improvements, the Chapter must work through the Navajo Nation Department of Airports Management to evaluate and identify the correct type and extent of improvement, funding to study, develop and maintain the airport, and identify related improvements in a specific airport/helipad master plan. Once a specific airport/helipad master plan is developed, it would be considered a referenced plan under this LRTP.

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2021 Navajo Nation

Long Range Transportation Plan



- Beclahbito Chapter
- Sanostee Chapter
- Pinon Chapter
- Dennohotso Chapter

In order for a community to identify the potential for aviation related improvements, the Chapter must work through the Navajo Nation Department of Airports Management to evaluate and identify multiple factors. Those factors include evaluating the correct type and extent of improvement, funding source for the study, plans to develop and maintain the airport, and identify related improvements in a specific airport/helipad master plan. Once a specific airport/helipad master plan is developed, it would be considered a referenced plan under this LRTP.



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6.0 TRANSPORTATION FUNDING

In FY 2021 the Navajo DOT funding totaled \$62.9 million. Navajo DOT utilized federal funds as well as several tribal revenue sources for both operating and capital expenditures. Navajo DOT receives funding directly from the Federal government.

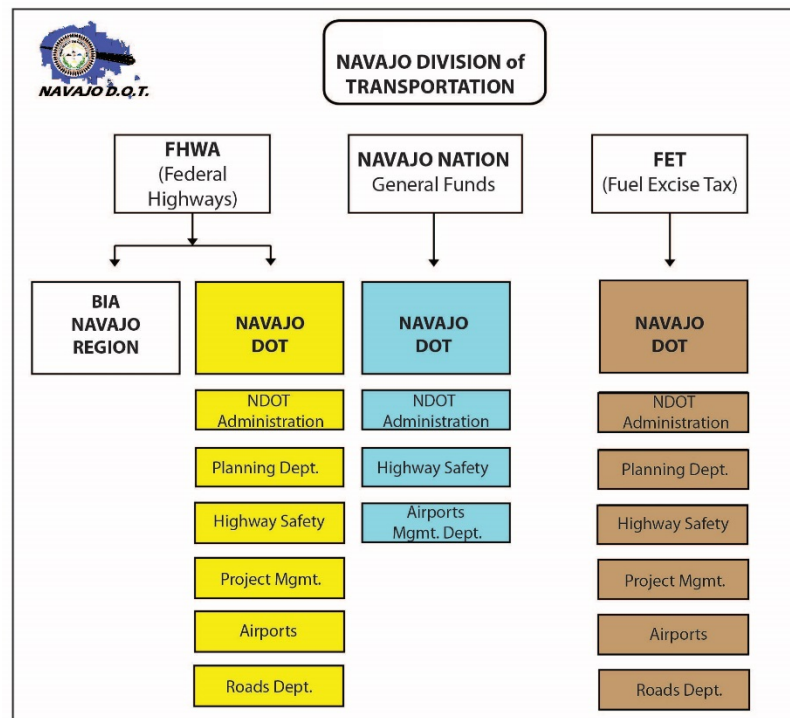
Outside of federal funds the Navajo Nation has several revenue streams that provide funding to Navajo DOT, including their General Funds, Fuel Excise Tax (FET), and Indian Health Services. These funding sources are summarized in Figure 6-1. Maintenance

Over a 20-year period, the total funding available to conduct roadway maintenance and construction activities totals \$820 million. The overall need to only address current pavement condition deficiencies is approximately \$1.4 billion. To upgrade the current roadway system (dirt, gravel, and paved roads) to current roadway standards is estimated to cost \$6.5 billion. The total \$7.9 billion needed to maintain the current system and upgrading to current standards, and does not include ongoing roadway maintenance costs for paved, gravel and dirt roads. Annual maintenance costs include:

- \$700 per mile for dirt road blade maintenance;
- \$2,000 per mile for gravel road maintenance; and
- \$6,000 - \$10,000 per mile for paved road maintenance.

Funding for maintenance projects typically come from several sources including the FET, TTP, BIA, Department of Interior (DOI), and "Special Projects".

Figure 6-1| FY2021 Navajo DOT Total Funding



6.1 COMMITTED & PLANNED TRANSPORTATION IMPROVEMENTS

The 2015 Tribal Transportation Improvement Program (TTIP) outlines a five-year program regarding how funding is used to manage the transportation system. Typically, Navajo DOT has an annual construction budget of approximately \$55 million to program projects in the Tribal Transportation Improvement Program (TTIP). The funding in the TTIP is a five-year, fiscally



2021 Navajo Nation

Long Range Transportation Plan



constrained program, and it must be consistent with the goals and objectives of the LRTP. Funding for construction projects typically comes from several sources including the FET, Tribal Transportation Program (TTP), FHWA Partnership and “Special Projects”.

The following activities are eligible for BIA Transportation Facility Maintenance Program. The list below is not all-inclusive. There are items in the following list that may not currently apply to Navajo Nation, but the inclusive list was Maintenance funds can only be used for the following activities:

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 tribal 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 of 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 tribal intermodal transportation facilities provided that there is a properly executed agreement with the owning public authority within available funding.

FINANCIAL CONSTRAINT

Financial constraint is an important aspect of project development activities. The 5-year TTIP is fiscally constrained based on the understood funding that Navajo DOT has to work with over the time period of the TTIP. In order for the TTIP to be approved by FHWA, it must be fiscally constrained, meaning that Navajo DOT is not trying to spend more money than it has in the 5-year period of the TTIP. Once a project is on the TTIP, the study and engineering phases begin, and it is also being environmentally cleared so federal funding can be used for construction activities. It is very important that once projects are listed in the TTIP, they stay in the TTIP so not to lose federal funding. Additionally, there are time limitations on how long the project can be



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Long Range Transportation Plan



“dormant” and still allow for the environmental clearances to remain intact to allow for construction activities to progress.

There are instances when funding opportunities arise, emergencies occur or required maintenance activities shift other projects in the TTIP. Great care must be taken in these circumstances to not lose federal funding in these instances, so close coordination between Navajo DOT and FHWA is required with any potential TTIP change. Communities can help to reduce “surprise” projects by closely coordinating with the Navajo DOT Regional Planner assigned to that Chapter. This involves working collaboratively on any grant applications for improvements, particularly when there is Navajo DOT funding, staff, equipment and ongoing maintenance responsibilities involved.

38-YEAR TTIP TO 5-YEAR TTIP

In 2013, Navajo DOT redefined the TTIP from a 38-year list of projects to an actively managed 5-year TTIP project listing. The previous 38-year TTIP was developed based on limited information and, most of the projects included in the TTIP had not been engineered or environmentally cleared. With this effort, Navajo DOT has been working very closely with all of the regulatory offices and project partners to reduce the number of outstanding projects that are in the TTIP.

The current process should include projects that are planned, scoped and designed in the out-years (last two years of the TTIP) and are constructed in the first three years of the TTIP. This creates a situation that forces projects to be delivered in a short period of time. Figure 6-2 illustrates the 5-year project timeline and relationship to project development in the TTIP. When funding is small, and the project costs are high and construction needs to extend over several TTIP years, it makes it critical to be accurate in the early stages of project development. The project development activities that include the environmental clearances can delay projects, so clear project definition is important to maintain the required schedules to receive federal funding. The project development activities are outlined in Figure 6-3. For large projects, allowing project phasing to occur can ensure significant financial resources are not spent on one project in any given TTIP year. Figure 6-5 illustrates the

project development process for all tribal transportation program funded projects.

Figure 6-2| Pre-Project Development Timeline

YEAR	1	2	3	4	5
	CONSTRUCTION	PROJECT DEVELOPMENT			





Figure 6-3| Potential Project Phasing Strategy

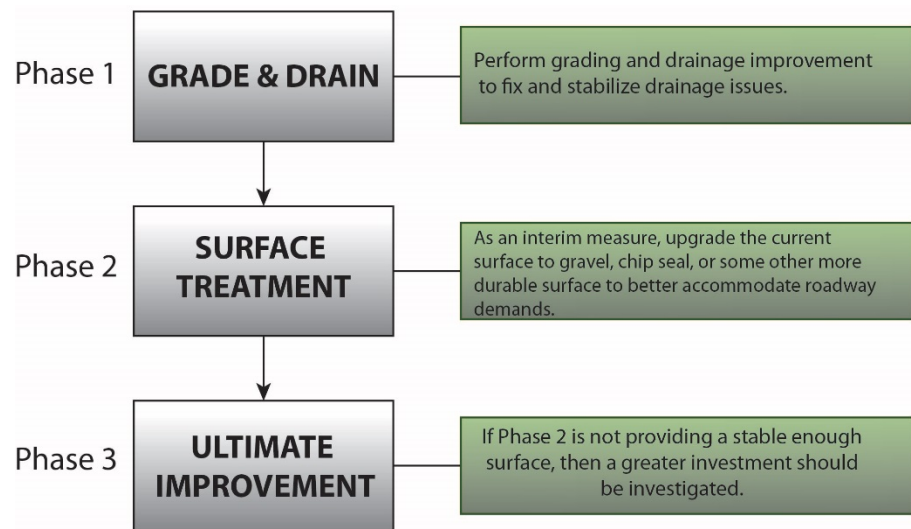


Figure 6-4| Improvement Strategies for Navajo DOT

Average Daily Traffic	Strategy
Greater than 1,000	Asphalt pavement
500 to 999	Double chip seal with gravel
250 to 499	Gravel and soil stabilization
100 to 249	Stabilized soil
Less than 100	Bladed dirt road

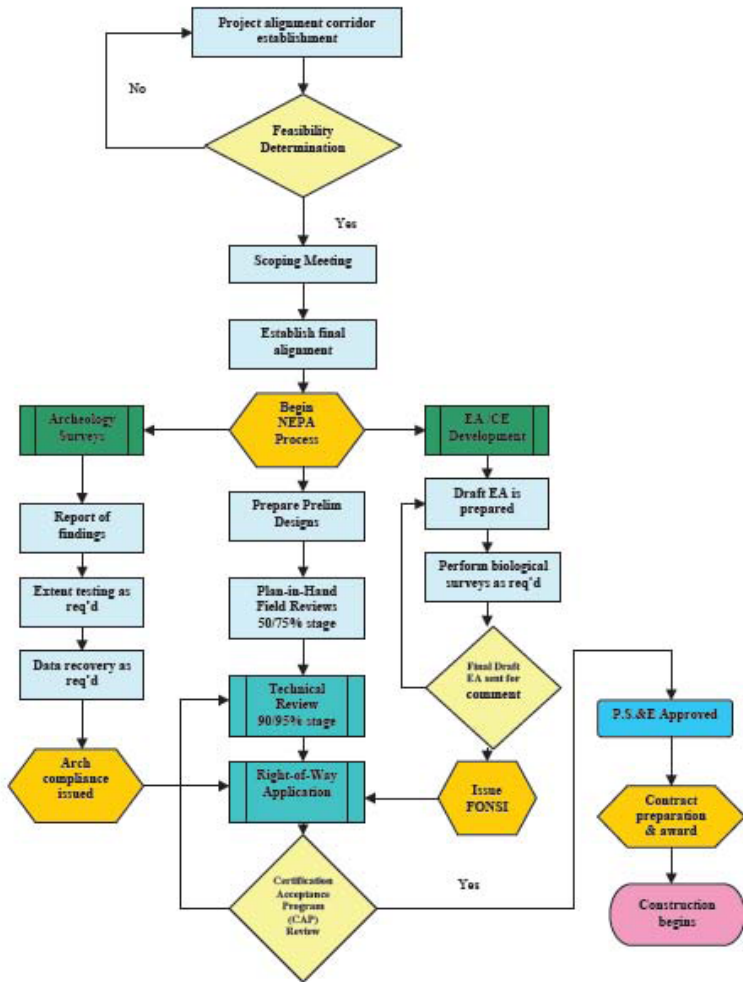


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Figure 6-5| Project Development Process



Source: Bureau of Indian Affairs (BIA)



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NATIONAL TRIBAL TRANSPORTATION FACILITY INVENTORY (NTTFI)

A proposed transportation facility is any transportation facility, including a highway bridge, that will serve public transportation needs, meets the eligibility requirements of the Tribal Transportation Program (TTP), and does not currently exist. It must meet the eligibility requirements of the TTP and be open to the public when constructed. In order to have a proposed facility placed on the NTTFI, a Tribe must submit all of the following to the BIADOT/FHWA Quality Assurance Team for consideration:

- (1) A Tribal resolution or other official action identifying support for the facility and its placement on the NTTFI.
- (2) A copy of the Tribe's LRTP containing:
 - (i) A description of the current land use and identification of land ownership within the proposed road's corridor (including what public easements may be required);
 - (ii) A description of need and outcomes for the facility including a description of the project's termini; and
 - (iii) The sources of funding to be used for construction.
- (3) If the landowner is a public authority other than the Tribe or BIA, documentation from the public authority that the proposed road has been identified in their LRTP, STIP approved by FHWA, or other published transportation planning documents.
- (4) Documentation clearly identifying that easements or rights-of-way have been acquired or a clear written statement of willingness to provide a right-of-way from each landowner along the route.

- (5) Certification that a public involvement process has been carried out for the proposed road.
- (6) A synopsis discussing the project's anticipated environmental impacts as well as the engineering and construction challenges.
- (7) Documentation that the project can meet financial or fiscal constraint requirements including financial information demonstrating that the project can be implemented using existing or reasonably available funding sources, and that the project route can be adequately maintained after construction. (See 23 U.S.C. 134 and 135.)
- (8) Documentation identifying the entity responsible for maintenance of the facility after construction is completed.
 - (b) For those proposed roads that were included in the NTTFI as of November 7, 2016, the information in paragraphs (a)(1) through (8) of this section may be submitted for approval to BIA and FHWA at any time, but is not required in order for those proposed roads to remain in the NTTFI, unless any changes or updates to the proposed road were (or are) made after that date (Code of Federal Regulations).

In addition to the NTTFI regulations, all new roads within Navajo Nation must be proposed through Navajo DOT. This allows the roadway to be inventoried and managed by Navajo DOT.



2021 Navajo Nation

Long Range Transportation Plan



7.0 PROJECT PARTNERING

Navajo Nation frequently coordinates with outside agencies on transportation projects and programs. This includes coordination with federal, state, regional, and local agencies. One of the LRTP Goals: *Enhance Existing Partnerships and Create New Partnerships* is critical for planning and project successes. The various planning and project partners described herein are just some of the critical partners that can assist in helping to plan and implement the LRTP.

7.1 FEDERAL AGENCIES

Navajo Nation often coordinates with the Bureau of Indian Affairs (BIA), the U.S. Department of Transportation (USDOT), and the Federal Aviation Administration (FAA).

7.1.1 BUREAU OF INDIAN AFFAIRS

The Navajo Nation has P.L. 93-638 contracts with the Bureau of Indian Affairs (BIA) and coordinates on project activities including project review, planning, and public hearings. BIA is organized in agencies that are defined with the same boundaries as Navajo DOT agencies. Currently, BIA and Navajo DOT have an agreement that Navajo DOT is responsible for maintaining BIA owned earth roadways, and BIA is responsible for maintaining the remaining BIA owned roadway facilities.

7.1.2 U.S. DEPARTMENT OF TRANSPORTATION

Navajo Nation is currently working with FHWA and BIADOT to transfer to the Nation, all of the functions and duties that the Secretary of the Interior would have performed with respect to a program or project under Chapter 2 of Title 23, United State Code, other than those functions and duties that cannot be legally transferred under the Indian Self Determination and Education Assistance Act IISDEAA), together with such additional activities as the Nation may perform under MAP-21 and 25 CFR Part 170. See

<https://www.transportation.gov/grants> for grant opportunities, process information, and schedules for funding.

7.1.3 FEDERAL AVIATION ADMINISTRATION

The Navajo Nation regularly applies and coordinates with the Federal Aviation Administration (FAA) on grants for airport planning and improvements.

The FAA website,

http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/acquisition/grants/ provides information on FAA grant funding and gives direction for proposal submittals.

7.1.4 FEDERAL TRANSIT ADMINISTRATION

Although Navajo Nation does not work directly with the Federal Transit Administration (FTA), the Navajo Transit Program applies for transit grants through the regional planning offices which ultimately pass onto the FTA. Refer to FTA's website <https://www.transit.dot.gov/funding/grants/grant-programs> for detailed information related to grant funding. Information related to discretionary grants, formula grants, the application process, and sample agreements is all provided at FTA's grant programs webpage.

7.1.5 U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

The U.S. Department of Housing and Urban Development (HUD) has many programs that provide grant funding to communities that are enhancing sustainability and livability. The HUD website,



2021 Navajo Nation

Long Range Transportation Plan



http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/grants provides information on HUD grant funding and gives direction to the grant management center, grant administration, and the application center.

7.1.6 U.S. ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA) provides several grant opportunities that relate to community sustainability practices. In terms of project development activities, the EPA has a direct role in the project development process through environmental reviews and clearances. Proper planning can provide streamlined reviews and approvals. Refer to EPA's website <http://www.epa.gov/grants> for detailed information related to grant funding. Information related to grants resources, the application process, rules, regulations and policies, as well as program offices near you is all provided at EPA's grant programs webpage.

7.2 STATE AGENCIES

The State DOTs from Arizona, New Mexico, and Utah are important partners in implementing projects and pursuing funding applications. Navajo Nation and the DOTs coordinate regularly and have Memorandums of Understanding (MOUs) to resolve planning, right-of-way, and other legal issues regarding road projects. For transit projects the Navajo Transit Program applies for transit grants and coordinates with state DOTs on transit projects.

7.2.1 ARIZONA DEPARTMENT OF TRANSPORTATION

The Arizona Department of Transportation (ADOT) is the governing agency over all state transportation infrastructures in Arizona. Within ADOT there are three key resources for the Navajo Nation LRTP including: the Arizona Tribal Transportation Program, the 5311 Rural Public Transportation Program, and the Traffic Safety Section. Refer to <https://www.azdot.gov/planning/TransitProgramsandGrants> for information related to various transit programs and program handbooks, applications, and awards.

ADOT NORTHEAST DISTRICT

The redistricting process for ADOT engineering and maintenance districts was recently conducted. Navajo Nation's first point of contact for ADOT is the District Engineer for the Northeast district; therefore all issues regarding Navajo DOT and state highway system and impacts on Tribal/BIA routes are addressed by the Northeast District Engineer.

MULTIMODAL PLANNING DIVISION

The Multimodal Planning Division at ADOT is responsible for Data and Analysis, Studies and Programs, Transportation Programming, Transit Programs and Grants, Airport Development, and statewide research.

ARIZONA TRIBAL TRANSPORTATION PROGRAM

The Arizona Tribal Transportation Program provides for oversight of state-tribal transportation related partnerships, planning and research projects, activities, groups, resources and tribal related coordination and consultation efforts. This Program is housed out of the ADOT Multimodal Planning Division. The Navajo Nation Partnership (NNP) was formed out of efforts of the Arizona Tribal Transportation Program to pursue identified common goals and strategies. The mission of the NNP is to develop, foster, and maintain good working relationships in order to construct, operate, and maintain the most reliable, economical, efficient and effective transportation system for the safety of the traveling public. NNP members include Navajo Nation, Navajo DOT, ADOT, BIA, FHWA, Hopi Tribe, Coconino County, Navajo County, and Apache County.

5311 RURAL PUBLIC TRANSPORTATION PROGRAM

The Section 5311 grant program's goals are to address the mobility needs of Arizona's rural population by enhancing access to health care, shopping, education, employment, public services and recreation; and assisting local communities in building effective transit services in rural areas. Navajo Nation's Navajo Transit System is one of the participating agencies in this program.



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TRAFFIC SAFETY SECTION

The ADOT Traffic Safety Section (TSS) investigates, recommends and evaluates improvements and countermeasures for traffic-related issues on the State Highway System. Specific programs of TSS include: the Arizona Strategic Highway Safety Plan (SHSP), the Arizona Highway Safety Improvement Program (HSIP), the Crash Modification Factors Clearinghouse, Road Safety Assessments, and Stewardship and Oversight Agreement for Arizona.

7.2.2 NEW MEXICO DEPARTMENT OF TRANSPORTATION

The New Mexico Department of Transportation (NMDOT) is the governing agency over all state transportation infrastructures in New Mexico. Within NMDOT there are three key resources for the Navajo Nation LRTP including: the Tribal Liaison Program, the Transit and Rail Division and the Traffic Safety Bureau.

TRIBAL LIAISON PROGRAM

In 2003 the Tribal liaison position was created as a full-time position using State Planning and Research (SPR) funds. The program is intended to help tribes understand and participate in the transportation planning processes. Program elements include: historic preservation in transportation planning, interagency cooperation and collaboration, and processes for tribal consultation.

TRANSIT & RAIL DIVISION

The Transit and Rail Division at NMDOT has several two divisions, the Transit Bureau and the Rail Bureau. The Transit Bureau conducts planning and service coordination for public bus transit throughout the state. The Rail Bureau conducts planning and service coordination for commuter rail as well as preparing and updating the State Rail Plan.

AVIATION DIVISION

The NMDOT Aviation Division is charged with advancing general aviation in New Mexico. This includes the coordination and administration of state grants used in improving aviation infrastructure and expending state funds for construction, development and maintenance of public use airport facilities. The Air Service Assistance Program is used to support and encourage air service to smaller communities.

TRAFFIC SAFETY BUREAU

The Traffic Safety Bureau is charged with education and enforcement of traffic laws and safety as well as the Highway Safety Plan.

NEW MEXICO INDIAN AFFAIRS DEPARTMENT

The New Mexico Indian Affairs Department (IAD) is responsible for implementing state-tribal policies intended to improve the quality of life for the state's Indian citizens. IAD's policy initiatives are designed to strengthen tribal and state relations and address the challenges of tribal communities; challenges such as economic development, infrastructure improvements, the protection of cultures and languages, health care, and educational opportunities.

7.2.3 UTAH DEPARTMENT OF TRANSPORTATION

The Utah Department of Transportation (UDOT) is the governing agency over all state transportation infrastructures in Utah. Within UDOT there are three key resources for the Navajo Nation LRTP including: the Transportation Planning Division, the Public Transit Team, and the Traffic & Safety Division. See <http://www.udot.utah.gov/main/uconowner.gf?n=4082819043218787> for a detailed information handbook related to UDOT Federal Transit Grant Programs.



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Long Range Transportation Plan



UTAH REVITALIZATION FUND

The Navajo Revitalization Fund (NRF) is a program of the State of Utah. The goal is to maximize the long-term benefits of state taxes paid on oil and natural gas production by providing both grants and loans to agencies of county or tribal government in San Juan County. The NRF is managed by a five-member board including a governor's designee, two members of San Juan County Commission, the chair of the Navajo Utah Commission, and the president of one of the seven chapters located in Utah. Priority projects include capital projects and infrastructure, housing projects, and educational endowments that promote economic development.

UTAH NAVAJO TRUST FUND DEPARTMENT

The Utah Navajo Trust Fund is a private purpose trust fund of the State of Utah. The fund accounts for several revenues received by the State including net oil royalties. The fund is managed by a three member board of trustees including the Utah State Treasurer, the Director of the State Division of Finance, and a State officer or employee appointed by the Governor, with advice and consent of the Senate. A nine-member Diné Committee provide input and advice on how the funds may be expended.

TRANSPORTATION PLANNING DIVISION

The Transportation Planning Division at UDOT is focused on coordination between jurisdictions to assure that transportation facilities and services operate as a total system.

PUBLIC TRANSIT TEAM

The Public Transit Team at UDOT promotes public transit throughout Utah by promoting and advocating for public transit, supporting and promoting effectiveness of public transit, leveraging transit resources, increasing responsiveness of transit services, and implementing equitable distribution of transit funds throughout the state.

TRAFFIC & SAFETY DIVISION

The Traffic and Safety Division at UDOT is responsible for overseeing research and programs that improve transportation safety statewide.

DIVISION OF AERONAUTICS

This Division of UDOT is responsible for all transportation issues involving aviation including licensing all public-use airports in the state and working with airport sponsors and managers to ensure the airports function as an important part of the statewide airport system.

7.3 REGIONAL GOVERNMENTS

Figure 7-1 illustrates that six regional government agencies overlap with Navajo Nation. Regional governments are the Metropolitan Planning Organizations, Councils of Governments or Rural Transportation Planning Organizations that are organized to facilitate transportation planning activities in defined geographical regions. The role of these agencies is to also manage the TIP and TIP funding for inclusion into the appropriate STIP. In areas such as Fort Defiance where the community is on the geographic boundary of two states, it can make it difficult to facilitate project funding.

The Navajo Nation is a participating member of the Northern Arizona Council of Governments and the Northwestern New Mexico Regional Planning Organization. Additionally, Navajo DOT planners often attend regional planning office meetings and are on many technical committees. The Navajo Transit Program applies for transit grants through the regional planning offices.

7.3.1 NORTHERN ARIZONA COUNCIL OF GOVERNMENTS

The Northern Arizona Council of Governments (NACOG) is the rural regional governing agency that covers the full extent of Navajo Nation in Arizona. Refer to http://nacog.org/index.cfm?fuseaction=dep_intro&dept_id=12 for more information regarding NACOG and their coordination with ADOT.



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Long Range Transportation Plan



7.3.2 NORTHWEST NEW MEXICO COUNCIL OF GOVERNMENTS

The Northwest New Mexico Council of Governments (NWNMCOG) is a rural regional governing agency that covers the majority of Navajo Nation in San Juan County and McKinley County, New Mexico. The NWNMCOG operates an independent transportation planning organization, the Northwest Regional Transportation Planning Organization (NWRTPO). Navigate to <http://www.nwnmcog.com/> for more information regarding NWNMCOG and potential partnership opportunities.

7.3.3 NORTH CENTRAL NEW MEXICO ECONOMIC DEVELOPMENT DISTRICT

The North Central New Mexico Economic Development District (NCNMEDD) is a rural regional governing agency that covers a small portion on the eastern limits of Navajo Nation within Sandoval and Rio Arriba Counties. Navigate to <http://ncnmedd.com/> for more information regarding NCNMEDD and potential partnership opportunities.

7.3.4 MID REGION COUNCIL OF GOVERNMENTS (MRCOG)

The Mid Region Council of Governments (MRCOG) is a significant Metropolitan Planning Organization (MPO) in the southeast limits of Navajo Nation within Bernalillo County. The MRCOG is the urban regional governing agency for the greater Albuquerque metropolitan area. Navigate to <http://www.mrcog-nm.gov/> for more information regarding MRCOG and potential partnership opportunities.

7.3.5 FARMINGTON METROPOLITAN PLANNING ORGANIZATION

The Farmington Metropolitan Planning Organization (FMPO) sits on the northeastern border of Navajo Nation in San Juan County. The FMPO is the urban regional governing agency for the greater Farmington metropolitan area. Navigate to <http://www.fmtn.org/index.aspx?NID=363> for more information regarding FMPO and potential partnership opportunities.

7.3.6 SOUTHEASTERN UTAH ASSOCIATION OF LOCAL GOVERNMENTS

The Southeastern Utah Association of Local Governments (SEUALG) is a rural regional governing agency that covers the northern portions of Navajo Nation in San Juan County, Utah. Navigate to <http://seualg.utah.gov/> for more information regarding SEUALG and potential partnership opportunities.

7.4 LOCAL GOVERNMENTS / COUNTIES

Navajo Nation overlaps into 11 counties (Arizona: Coconino County, Navajo County, and Apache County. New Mexico: San Juan County, McKinley County, Cibola County, Rio Arriba County, Sandoval County, Bernalillo County, and Socorro County. Utah: San Juan County.) The Navajo Nation often works with county highway programs for road construction planning, funding and maintenance. Additionally, the Navajo Nation and/or Chapters have Memorandum of Understandings (MOU) with several counties in Arizona, New Mexico and Utah.

7.5 NAVAJO NATION DIVISIONS AND DEPARTMENTS

Within the Navajo Nation government structure, there are several Divisions and Departments that can work together with the Division of Transportation to further the goals of the Nation. For instance, the Division of Community Development has the responsibility of establishing and maintaining the 16 Administrative Service Centers. These Service Centers are staffed with a Planner, who should have direct and frequent contact with the Navajo DOT Planning staff within each Agency.

The Navajo Nation Chapters located within the State of New Mexico have the opportunity to seek funding through the State's Infrastructure Capital Improvement Plan (ICIP) Program. Each year the Chapters are required to update their project information on the State's ICIP website with an emphasis on each Chapter's top five (5) priority projects. If a Chapter decides to seek NM Capital Outlay or Tribal Infrastructure Funding (TIF), their project needs to correlate with their State ICIP accordingly. Any NM State funding awarded to Navajo Nation Chapters will be managed by the New Mexico Indian Affairs



2021 Navajo Nation

Long Range Transportation Plan



Department (NMIAD) through a joint-powers agreement with the Navajo Nation. With the right amount of planning on projects that meet the State's infrastructure goals, NM funds are a powerful alternative that Chapters can take advantage of for matching funds.

The Navajo Nation Department of Diné Education is a critical partner to communicate with Navajo DOT to coordinate maintenance activities for bus routes. As an example, the Regional Routes have tried to assist with this need. Navajo DOT will develop a process to evaluate surface treatment strategies for bus routes on roads with less than 100 AADT, and will be included in the TTIP process

The NM Indian Affairs Department is a great resource that has policies specific to improving the quality of life for tribal citizens. Strategic alliance with NMIAD is important to communicate the Nation's needs and can help with coordinating efforts with the Governor's Office, the Transportation of Secretary, as well as State Representatives.



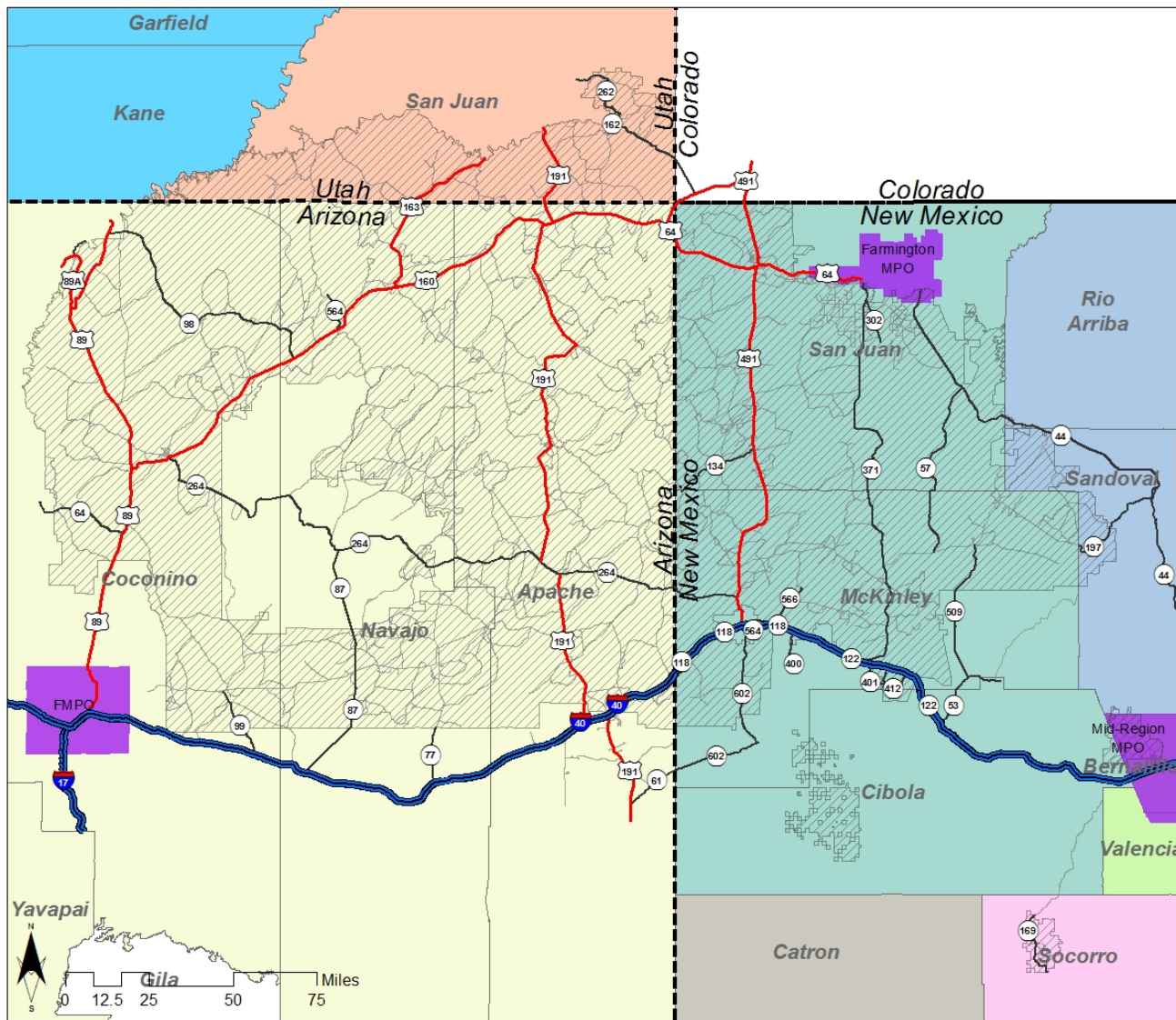
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Figure 7-1| Navajo Nation Governmental Boundaries



Navajo Nation

Boundaries

- Navajo Nation
- Metropolitan Planning Organization
- County

Regional Planning Government

- MRRPO
- NPRPO
- NWRPO
- SCRPO
- SWRPO
- NACOG
- Five County
- Southeast Utah

Road Hierarchy

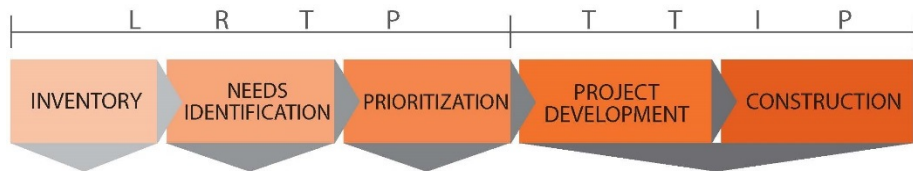
- Interstate
- US Highway
- State Highway
- BIA Routes





8.0 STRATEGIES AND PERFORMANCE MEASURES

Each function that Navajo DOT has, also has a set of implementation strategies and associated performance measures to understand and measure how progress is being made in accomplishing the goals of the LRTP. Nationally, performance-based planning has become extremely important in order to measure how much impact investments are making. For Navajo DOT, these investments relate to the planning, inventory of, maintenance, upgrading, and construction of transportation assets (e.g. roads, bridges, airports, sidewalks, traffic signals, roundabouts, safety improvements). The following sections outline strategies and performance-based measures so Navajo DOT and the communities across Navajo Nation can understand how progress is being made relating to inventorying assets, identifying needs, and prioritizing those needs through a transparent process with the limited amount of funding that is available.



8.1 INVENTORY

Inventorying the system is a critical function the Planning Department plays in order to understand the transportation system. The teams required to collect, manage, analyze and share the data provide important inputs to the maintenance, project development, engineering and construction functions of Navajo DOT and the communities. The official inventory, National Tribal Transportation Facility Inventory, or NTTFI, is what is used to quantify the quality and quantity of the transportation system.

For a data-driven process to be functional, data must be collected regularly, and managed in a manner that can be utilized for those that need the data for informed decision making. From this data-driven process, the “performance” of how decisions are influencing how well the greatest needs are being addressed can be measured and reported so adjustments regarding how funding is spent can be made. Figure 8-1 illustrates the strategies related to inventory efforts so a data-driven process to protect transportation assets and prioritize needs based on thorough and understood information.

Figure 8-1| Inventory Related Strategies



There are several performance measures related to the inventorying of assets that should be explored. Figure 8-2 identifies some performance measures that would assist management and elected officials in understanding how efficient and effective inventory efforts are being conducted.

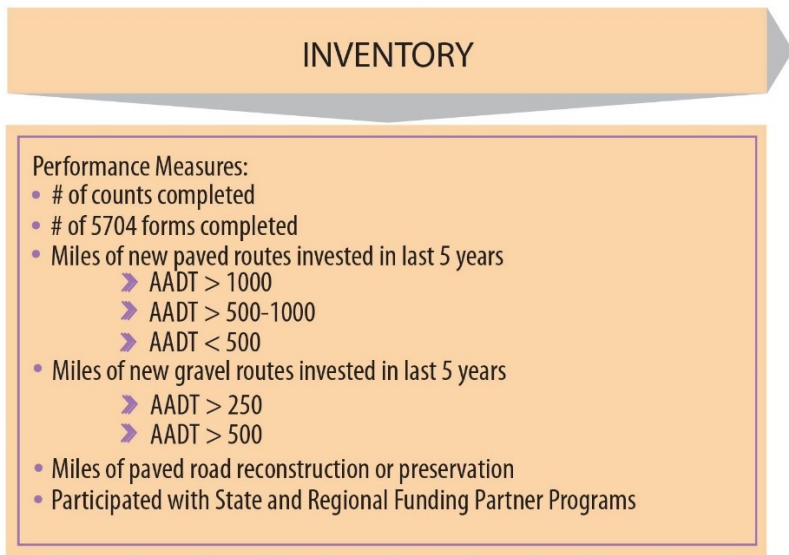


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Figure 8-2 | Inventory Related Performance Measures



used to understand trends so needs identification processes can be refined and improved upon.

Figure 8-3| Needs Identification Strategies



8.2 NEEDS IDENTIFICATION

Needs identification is critical to properly understand the issues to be addressed, and to identify a correct set of improvement strategies. Needs identification can come in several formats including reports that Navajo DOT develops, High Crash Location Reports, state or other agency plans, CLUP, and other reports or public input.

It is important to distinguish the difference between a need, and a project. A need is directly related to an issue. It has to be defined and examined in order to understand the various related issues. Once understood and studied, a project is defined through the project development process. The solution, or set of solutions is defined in the project development process – not the needs identification process. Figure 8-3 illustrates strategies that can be developed to enhance the understanding and use of data for needs identification. Figure 8-4 provides several performance measures that can be

Figure 8-4| Needs Identification Performance Measures

2021 Navajo Nation

Long Range Transportation Plan



NEEDS IDENTIFICATION

Performance Measures:

- Paved and gravel surface preservation
- # of CLUP plans updated
- Miles of dirt road bladed
- # of fatal/serious injury crashes
- Percent of correct sections in GIS
- Annual quarterly reports
- Regional meetings held
- Data sharing with divisions, funding partners, and communities

8.3 PRIORITIZATION

Prioritization is a critical process that involves data and discussion to identify and act upon the highest priority needs. The priorities span across all of the goals, infrastructure and Navajo DOT processes and procedures. The highest priority needs are properly scoped, designed, and programmed in the TTIP for construction. Strategies related to prioritization are included in Figure 8-5, and performance measures to assist in understanding how well the prioritization process is working is included in Figure 8-6.

Figure 8-5| Prioritization Strategies

PRIORITIZATION

Performance Measures:

- Data Driven Process
 - » 15 mile maintenance plan
 - » Safety improvement program
 - » Funding allocations
 - » Bridge program
 - » FET and other taxable items to be directed to Navajo Nation
 - » AADT/DATA collection
 - » GIS data
- Appropriate Staffing to Address Demand
 - » Public Involvement
 - » Community
 - » Regional Meeting
 - » Consultation Meetings with DOT
 - » Technical Assistance
- Standard processes
- Enhance partnerships
- Access to matching funds
- Common criteria for project selections
- Provide training for all levels
 - » Staff
 - » Management
 - » Community Members
 - » Elected Officials





Figure 8-6 | Prioritization Performance Measures

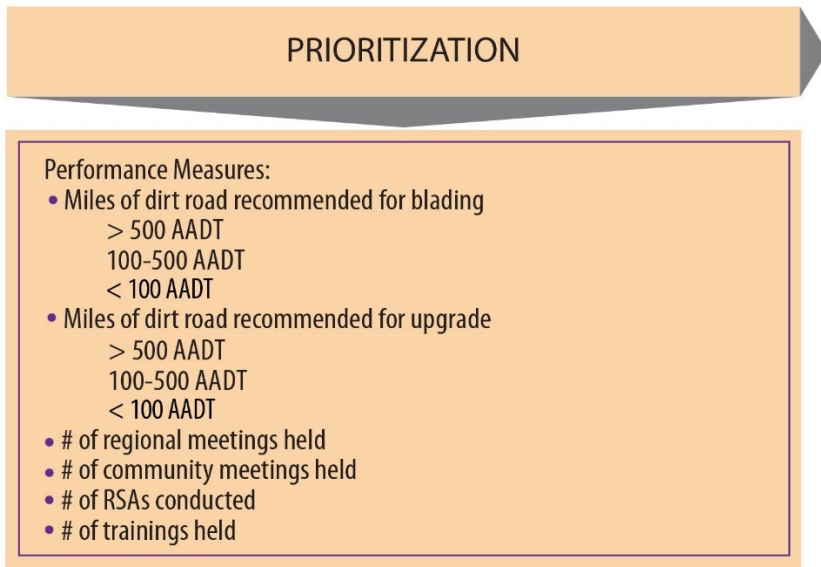
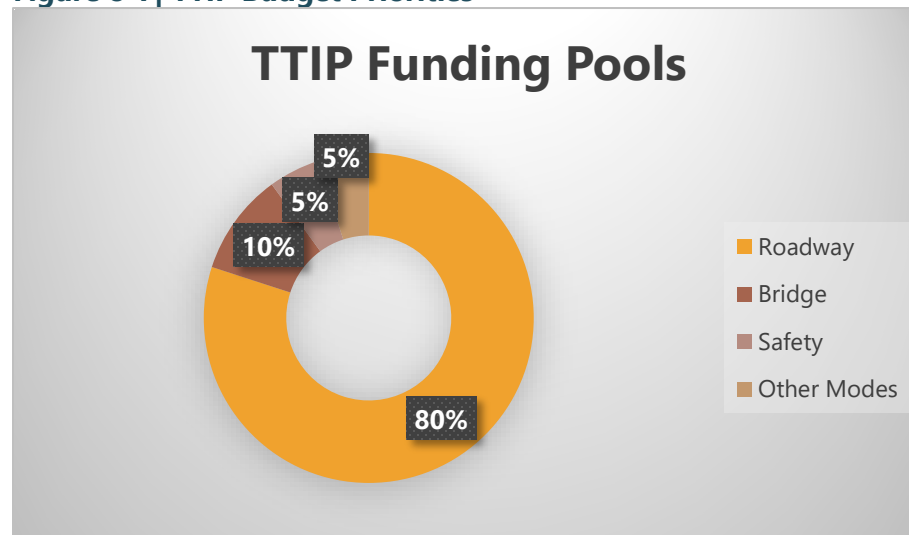


Figure 8-7 | TTIP Budget Priorities



8.4 TTIP BUDGETING

Based on the NTTFI data needs evaluation, a strategy related to TTIP budgeting could assist in addressing many of the needs. To accomplish this, it is recommended that separate funding pools or programs be adopted to separate the TTIP funding into the following categories:

- Roadway (80% to 85% target over 5-years)
- Bridge (5% to 10% target over 5-years)
- Safety (5% target over 5-years)
- Other Modes (bicycle, pedestrian, aviation, other) (5% target over 5-years)

For all of these programs, there are many project partners that have grant opportunities that may be able to augment TTP funding. It is very important that any grant opportunities that are sought for transportation related funding be coordinated through the Navajo DOT Regional Planners. Ultimately Navajo DOT has the responsibility to operate and maintain the tribal transportation systems. In many cases, grants only provide a proportion of the required funding so it is important that grant opportunities are sought for and further the Nation's priorities.

Figure 8-7 illustrates the separate funding pools that would comprise the TTIP Budget.





9.0 IMPLEMENTATION AND MONITORING

The LRTP was developed through a collaborative process that was coordinated through federal, state, local, tribal, regional agencies, and the public stakeholders to develop and agree upon the goals of this LRTP. This implementation and monitoring section will outline the following:

- Developing an on-going process known to participants for tracking conditions and monitoring progress toward plan objectives;
- Establishing a process for how decisions regarding implementation are to be made; and
- Establishing a well-defined process for how priorities will be set.

These three key process are outlined herein to help provide a common understanding of how plan implementation will occur.

9.1 MONITORING PROGRESS

Progress made for each goal should be summarized and communicated to agency officials and the Chapters on an annual basis. The information for roadways and bridges (and other infrastructure, system data collection, etc.) should be maintained in a Geographic Information Systems environment for easy access, querying and summary. Data collection activities by Navajo DOT are an essential function in order to understand and report on system conditions and activities. The following items should be included in the progress summary:

TAKE CARE OF THE SYSTEM

As part of the LRTP update process, the following items will be tabulated and summarized to understand system level condition progress. These updates will address transportation deficiencies within the Navajo Nation and will allow for adjustments in prioritization. The following items will be updated:

- Dirt Roads
 - Miles of road with AADT less than 100

- Miles of grade and drain improvements for roads with AADT less than 100;
- Miles of road with AADT between 100 and 249;
- Miles of grade and drain improvements for roads with AADT between 100 and 249;
- Miles of road with AADT between 250 and 499;
- Miles of grade and drain improvements for roads with AADT between 250 and 499;
- Miles of road with AADT of 500 or greater; and
- Miles of grade and drain improvements for roads with AADT of 500 or greater.
- Gravel Roads
 - Miles of gravel roads;
 - Miles of gravel roads bladed; and
 - Miles of gravel roads re-improved/maintained.
- 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.
- Bridges
 - Number of Navajo DOT bridges;
 - Number of Navajo DOT bridges with a sufficiency rating between 50 and 80.



2021 Navajo Nation

Long Range Transportation Plan



- Number of Navajo DOT bridges with a sufficiency rating between 50 and 80 that were repaired.
- Number of Navajo DOT bridges with a sufficiency rating of less than 50.
- Number of Navajo DOT bridges with a sufficiency rating of less than 50 that were repaired or replaced.

ENHANCE EXISTING PARTNERSHIPS AND CREATE NEW PARTNERSHIPS

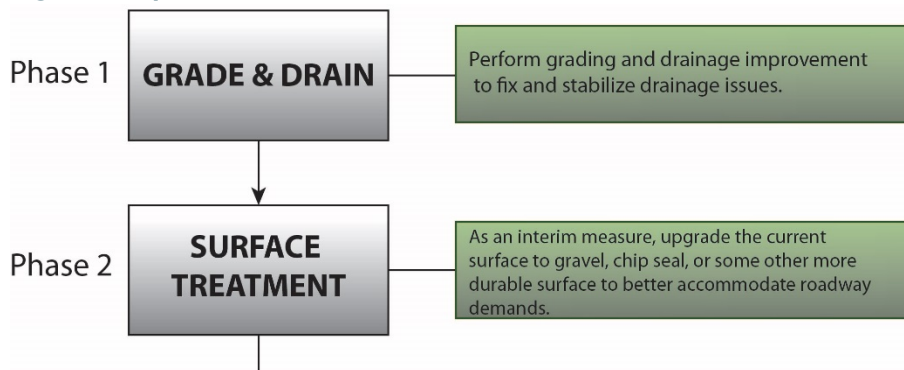
On an annual basis, Navajo DOT will schedule and participate in State DOT consultation meetings that provide a forum for an exchange of information.

On a quarterly basis, Navajo DOT currently hosts “Regional Meetings” for Chapter delegates and county/state partners to learn about current program activities and ask questions of Navajo DOT. This forum also provides an opportunity for Navajo DOT to learn about Chapter activities and priorities such as new development, updated CLUP plans or other undertakings.

MAXIMIZE TRANSPORTATION INVESTMENT EFFECTIVENESS

Navajo DOT must spend transportation funding frugally, which requires a performance-based approach to help stretch every dollar. Because there are so many system-level needs, a three-phased approach (Figure 9-1) was developed to address a broader set of needs and address fundamental issues and create a network of “all-weather” roadways.

Figure 9-1| Three-Phased Improvement Approach



The three-phased approach outlined in Figure 9-1 is primarily aimed at addressing needs related to dirt roads. The AADTs in Table 9-1 provide guidance on priority based on AADT. For the greatest impact, the priority ratings should align with community priorities. To accomplish this, Navajo DOT must work closely with the communities to share the data and achieve a common understanding of travel demand on the network. When the priorities in Table 9-1 align with the community priorities for the regional routes (15-mile plan), then those corridors in agreement should be the highest priority for grade and drain improvements. After grade and drain improvements are completed, then a separate evaluation should be undertaken to determine an appropriate Phase 2 surface treatment based on the type and amount of use the roadway experiences, including all modes. If the Phase 2 surface treatment is not providing a stable enough surface, then a major investment/Phase 3 improvement may be warranted.

Besides phasing improvements, specific improvement project recommendations should also rely on data, primarily, to determine solutions as outlined in Table 9-1.

Table 9-1| Road Maintenance Priority

<100 AADT	100-249 AADT	250-499 AADT	500-999 AADT	1000+ AADT
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2021 Navajo Nation

Long Range Transportation Plan



Major Arterial	Low	Low	Moderate	High	High
Minor Arterial	Low	Low	Moderate	High	High
Collector	Low	Low	Moderate	High	High
Local	Low	Low	Moderate	High	High
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	High

Bridges are also a critical component to transportation and mobility. Table 9-2 depicts a strategy related to roadway functional classification and the actual bridge condition surveyed in the bridge reporting to Navajo DOT.

Table 9-2| Bridge Maintenance/Replacement Priority

	Failure	Fair	Good	Excellent
Major Arterial	High	Moderate	Low	n/a
Minor Arterial	High	Moderate	Low	n/a
Collector	High	Moderate	Low	n/a
Local*	High	n/a	n/a	n/a

* Bridge replacements on local roads should consider available alternative routes before considering a “High” need.

To monitor this progress, an annual report that outlines the miles of roads recommended for Phase 1, Phase 2 and Phase 3 improvements, and the number of bridges recommended for improvement/replacement. The report should include the roadway functional classification, ADT and if a bridge, the current bridge condition sufficiency rating and status. The report should also

include if there was consistency between Navajo DOT and the community’s identification of a regional route priority.

ENHANCE SAFETY

To enhance safety on Navajo Nation’s roads, it is important to establish and understand the baseline conditions of safety on Navajo Nation. This understanding will provide the needed insights for the technical analysis to develop Emphasis Area definitions for safety practitioners to understand the issues that Navajo Nation is facing. Agency and stakeholder focused safety efforts that involve and integrate the engineering, enforcement, emergency services and education (4-E) stakeholders and practitioners into a program to develop, advance and implement safety implementation strategies would provide a foundation to advance safety efforts and attract safety funding grants. Developing and completing a Strategic Safety Plan would assist Navajo Nation in understanding and improving transportation system safety.

Once safety data is readily available and quantified in a way that can be associated with proposed Navajo DOT work, the safety conditions should be reviewed to understand how understood safety issues can be improved or mitigated with any proposed project.

CREATE CONNECTIONS

Connecting where people live to where they work, recreate and conduct business is essential for a functional transportation system. These connections occur both internally and externally to Navajo Nation. Many of these efforts will require close coordination with other partner agencies such as Navajo Transit, city, county and state DOT representatives.

PROVIDE OPTIONS

Every project should evaluate the need to accommodate pedestrians, bicycles, and bus stops (school and transit). To report progress in providing mobility options, an annual report will be developed that summarizes:

- Miles of roads recommended in TTIP to include improved bicycle accommodation.



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Long Range Transportation Plan



- Miles of roads recommended in TTIP to include improved pedestrian accommodation.
- Number of bus pull-outs or bus stops recommended to be improved in the TTIP.

PROMOTE ECONOMIC DEVELOPMENT

Economic development activities are typically related to a local Chapter or other Division action or set of actions that eventually require Navajo DOT assistance for access with a transportation facility. It is important that these activities are coordinated with Navajo DOT at the early stages of understanding so any proposed improvements can be integrated into the project development process without impacting other projects already in the TTIP. To report progress in promoting economic development, a quarterly report will be developed that summarizes the number and location of potential projects coordinated with Navajo DOT. It will also summarize the number of projects and actual projects being delayed, if any.

9.2 DECISION MAKING

The decision-making process for recommendations relation to fund expenditures is held through the Navajo Nation Resources and Development Committee. The process is outlined in Figure 9-2.



Figure 9-2| Decision Making Process

Soon after receiving the official NTTFI inventory listing annually, the Planning Department will summarize the system conditions and outline a programming strategy based on the system conditions, and note the changing conditions based on the inventory. This data-driven approach will provide an informed method to identify funding pool targets for:



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- Roadway;
- Bridge;
- Safety;
- Airport; and
- Other Modes.

After the initial approval from the Resources and Development Committee on funding pool targets based on the data, the Planning Department will also maintain a list of “eligible routes” that are data-driven needs identified through this performance-based approach, and will be updated annually.

Each of the Navajo DOT Agencies will have a level of funding distribution based on the needs for each type of funding pool. In many cases, the funds will not be the same across each Agency as inventory asset conditions and system issues differ between the agencies.

The potential project selections and programming of projects will be determined based on available resources, including staff resources, to complete any needed design, clearances and approvals. The programming of projects will include all funding, including TTP and FET at a minimum.

The next step includes an FHWA review of the proposed projects to be entered into the TTIP. This early review will assist Navajo DOT by providing additional information relating to other funding that may be available, procedural issues and pending approvals prior to submitting to the Resources and Development Committee.

9.3 TRANSIT RECOMMENDATIONS

Navajo Transit is in the process of transferring operations to be under the Division of Transportation. This change will help to promote a seamless linkage between the infrastructure investments such as stop improvements, and the Tribal Transportation Improvement Program. The Navajo Transit System provides excellent service between the cities/populated places within Navajo Nation. However, there is a significant opportunity to provide local transit service within each of the communities to:

- Connect people with services;
- Connect people with Navajo Transit regional route stops;
- Connect people with schools; and
- Connect people with jobs.

To accomplish local transit service, individual community Transit Feasibility Studies and Plans should be developed to examine the potential for service; identify a recommended route; identify potential stop locations and necessary stop infrastructure; develop a potential service plan; and develop a preliminary operations and maintenance plan. Local community Transit Feasibility Studies and associated Plans should be developed for Tuba City, Kayenta, Chinle, Fort Defiance/Window Rock, Shiprock, Ganado and Crownpoint.

9.4 PRIORITIZATION PROCESS

The priorities for all improvements must be performance-driven based on data. At a minimum, the following criteria will be used when applicable, to determine eligibility for a future road project:

- Surface condition (paved routes);
- Average Annual Daily Traffic;
- Drainage washout areas;
- Regional Route designation by Chapter;
- Bus route;
- Bridge condition (sufficiency rating and status);
- Fatal and serious injury crashes (when available); and
- Roadway Functional Classification.

The Tribal Transportation Improvement Program prioritization and programming process will identify specific data breakpoints for roadway project eligibility, using each of the above criteria. The list of eligible routes will be maintained as Appendix F. The list will include, at a minimum:



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- All paved roads in NTTFI;
- Dirt roads in NTTFI:
 - AADT of 250 or more and a Regional Route – highest priority;
 - AADT of 250 or more and not a Regional Route – high priority;
 - AADT of 100 to 249 and a Regional Route – moderate priority;
 - AADT of 100 to 249 and not a Regional Route – low priority;
 - AADT of 0 to 99 – lowest priority.
- All gravel roads in NTTFI;
- Routes that include collaboration (Chapter, County, State, etc...) and potential joint funding / memorandums of understanding (included as Appendix H).
- Reoccurring drainage washout areas on roads in NTTFI (included as Appendix I);
- All bridges in the bridge inventory (included as Appendix C).

Once the list of eligible routes is developed, the Planning Department will use the criteria above to prioritize the needs based on achieving the goals of this LRTP. Communication regarding the prioritization process and recommendations to the Resources and Development Committee will be shared at the Regional Planning Meetings.

Appendix G will be reserved for projects (new roadways, paths, etc...) that are not part of the existing transportation system. In order for a new roadway to be considered for inclusion, it must be recommended as part of a Chapter's CLUP plan or an approved study.

Due to limited funding availability, proposed projects that dramatically change existing alignments, have excessive environmental impacts and are high cost (greater than 40% of an annual TIP budget) may have a lower priority over other potential projects.



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Appendix A: Road Summaries

National Tribal Transportation Facility Inventory (NTTFI) were compiled using the street classification system the Bureau of Indian Affairs (BIA) created to identify types of roads. According to the BIA:

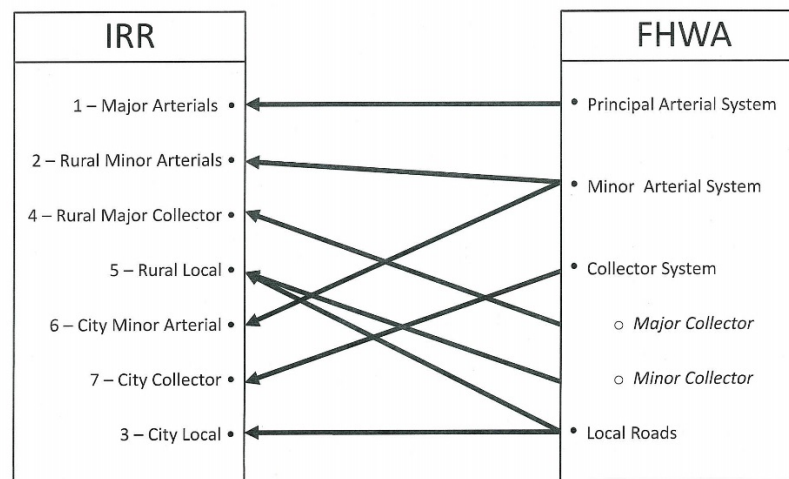
- Class 1- Major Arterial: Serves traffic between large population centers and maintain an average daily traffic volume of 10,000 vehicles per day or more with more than two lanes of traffic.
- Class 2- Rural Minor Arterial: Provide a connection to smaller towns and communities and generally allow high overall traffic speeds with minimum interference to through traffic movement. Facilitates less than 10,000 vehicles per day.
- Class 3- City Local: Streets located within communities serving residential areas.
- Class 4- Rural Major Collector: Serves as a collector to rural local roads.
- Class 5- Rural Local: May serve areas around villages, farming areas, schools, attractions, or various small enterprises. Also included are roads/trails for administration of forests, grazing, mining, oil, recreation, or other use purposes.
- Class 6- City Minor Arterial: Located within communities and serve as access to major arterials.
- Class 7- City Collector: Located within communities and serve as collectors to the city local streets.
- Class 8- This class encompasses all non-road projects such as paths, trails, walkways, or other designated types of routes for public use by foot traffic, bicycles, trail bikes, snowmobiles, all-terrain vehicles, or other uses to provide for the general access of non-vehicular traffic.

These eight Class Codes were used to generate an inventory of the roads within Navajo Nation. Appendix A calculates the lane mileage of each class of road and calculates the Pavement Condition Index (PCI). The total cost of maintenance is also included.

Priorities must be set to maintain the roads that have the greatest need. It is essential that roadways in fair condition with high average daily traffic be improved and not neglected. Properly maintaining paved roads is a cost-effective approach versus allowing the pavement quality to deteriorate to the level of need for major maintenance and/or reconstruction.

Navajo Division of Transportation Classification Methodology

FHWA Classification Assessment (Rural & Urban)



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Appendix B: Pavement Maintenance Strategy



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Appendix C: Bridge Summaries

The bridge system includes all bridges on public roads, or providing access to, Navajo Nation lands. When including bridges on state managed roads and highways there are a total of 720 bridges as part of the National Bridge Inventory bridge system within Navajo Nation. This summary is concerned with 71 bridges that are owned and maintained by the BIA on BIA and Tribal roadways. Bridge conditions on the tribal bridge system are inspected every two years. As part of the inspection, a condition rating between zero and 100 is calculated for each bridge. To be eligible for rehabilitation, a bridge must be deficient and have a condition sufficiency rating of 80 or less. A bridge is eligible for replacement where the sufficiency rating is 50 or less. Appendix C details the 71 bridges that scored the lowest sufficiency rating scoring below 80, qualifying them to be eligible for rehabilitation. Of those bridges, 30 are eligible for replacement because they scored a sufficiency rating of 50 or less.



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Appendix D: Pedestrian Accommodation Needs

A preliminary assessment of sidewalk needs was completed for each of the communities. There is extensive pedestrian traffic in rural areas outside of the developed communities. Making investments to improve the safety for those individuals is also important, which could include paving or graveling shoulders and providing space on bridges to accommodate pedestrians. The correct solution for accommodating pedestrians should go through the project development and CLUP processes, just as the other transportation investments do.



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Appendix E: Functional Classification Cross Sections



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Appendix F: Eligible Routes Listing



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Appendix G: Proposed New Routes



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Appendix H: Collaboration Improvements with Other Agencies



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Appendix I: Washout Areas



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Appendix J: Deferred Maintenance List



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Appendix K: Airport Improvements



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Appendix L: Strategic Highway Safety Plan (SHSP)



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Appendix M: Survey Results



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Appendix N: Goals



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Appendix O: Navajo DOT Processes



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