



Ganado/Burnside Area Traffic Circulation Study

WORKING PAPER 1: EXISTING AND FUTURE CONDITIONS

July 2015



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1. STUDY OVERVIEW

The *Ganado/Burnside Area Traffic Circulation Study* is a joint effort by Apache County District II, Ganado Chapter of the Navajo Nation, and the Arizona Department of Transportation (ADOT) to identify and address the most critical current and future transportation needs within Ganado and Burnside. The study is being funded by Federal Highway Administration's (FHWA) State Planning and Research Program and administered through ADOT's Multimodal Planning Division's Planning Assistance for Rural Areas (PARA) program. The primary goal of this study will be to develop a transportation improvement plan that promotes safety and mobility, enhances economic vitality, improves community livability, encourages environmental and cultural sensitivity, and supports current and planned economic development.

This Working Paper will inventory and analyze existing and future conditions for all modes of transportation within the study limits. Findings from this document will serve as a baseline in the evaluation of improvement scenarios that address the existing and future multimodal needs of the study area. The study will focus mainly on State Route 264 (SR 264), US Highway 191 (US 191), Navajo Route 15 (N15) and Navajo Route 27 (N27), and other key local streets in order to optimize safety and mobility conditions. Ultimately, the study will recommend phased improvement projects to address the most critical transportation needs of the study roadways. Study findings will also be used to recommend updates to the Tribal Transportation Improvement Program (TTIP) over the next 5-, 10-, and 20-year horizon periods.

STUDY AREA OVERVIEW

Formally established in 1901, today Ganado is a major center for education, healthcare, and government services on the Navajo Nation. Also due to recent growth along N15 near Burnside and within Ganado, the study area's roadways have experienced numerous "growing pains." As a developing community with several safety, congestion, and circulation issues, it is critical that the community develop a plan to improve safety and mobility for all transportation modes while maintaining its cultural heritage and quality of life.

Located at the crossroads of ancient trade routes, the Ganado/Burnside study area is comprised of the major regional corridors of SR 264, US 191, N15, and N27, as well as a network of paved and unpaved local roadways. These major corridors provide access for local residents, as well as regional connections for tourists, commuters, and heavy trucks to Chinle, Window Rock, Interstate 40, and other activity centers. Locally, the Hubbell Trading Post, the oldest operating trading post on the Navajo Nation, generates significant tourist traffic.

Figure 1.1 provides an overview of the Ganado/Burnside area and the study roadways.

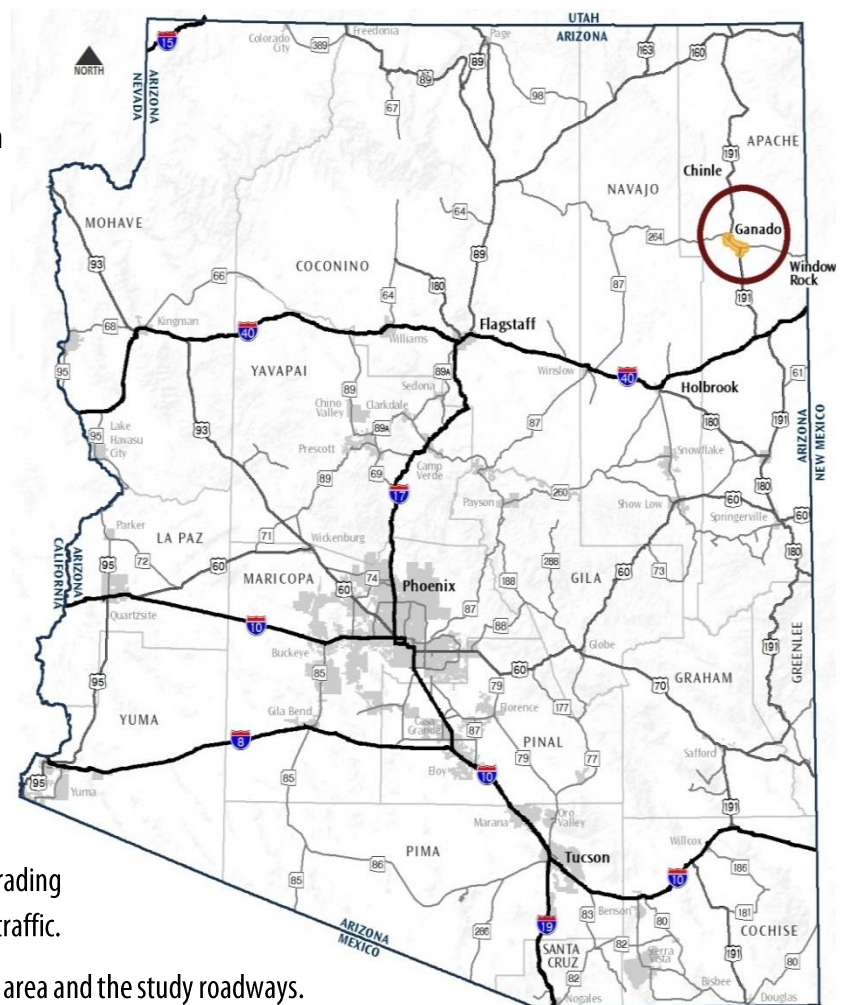
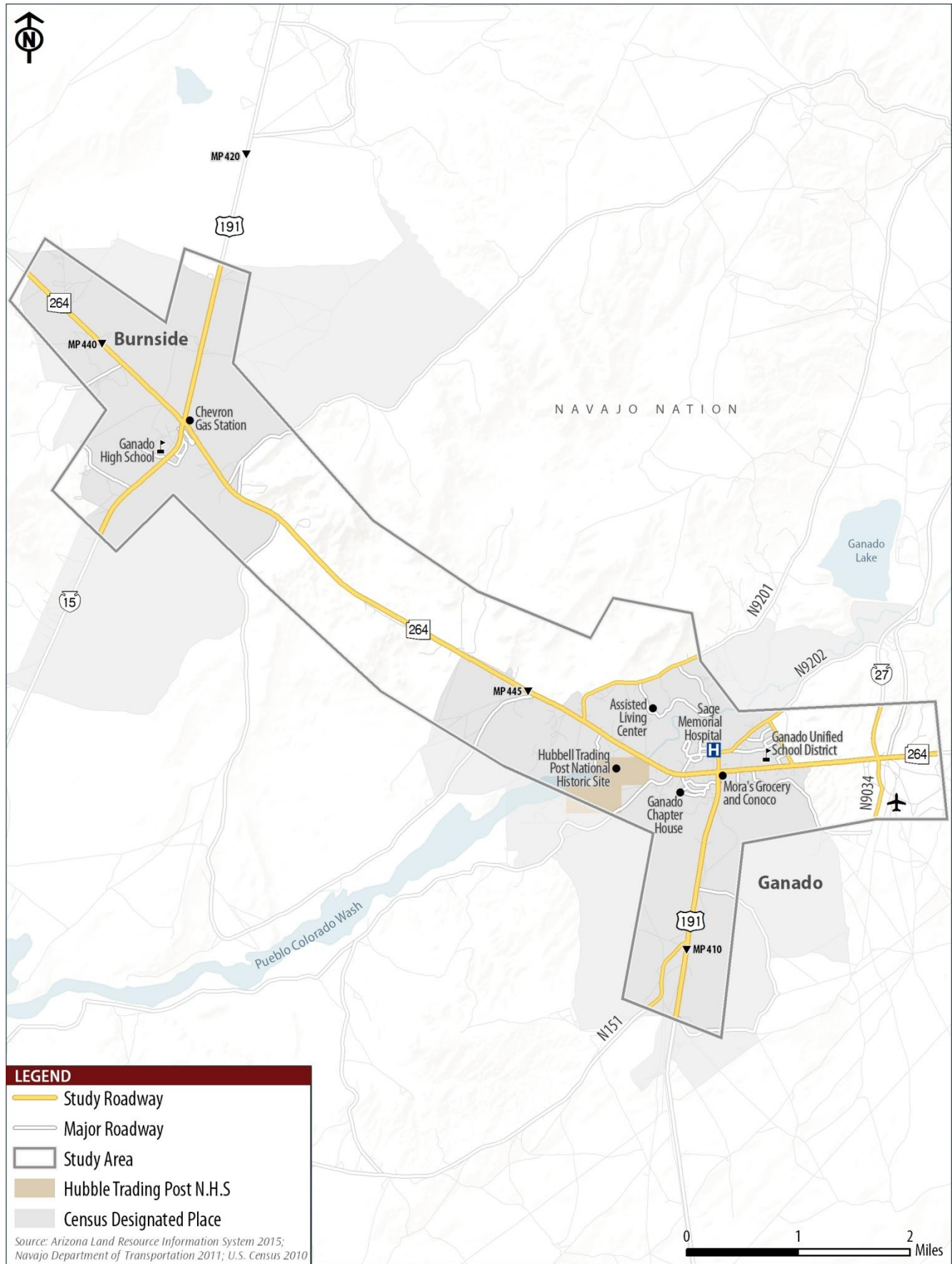


Figure 1.1. Study Area



PURPOSE AND NEED

The Ganado/Burnside Area Traffic Circulation Study was initiated to develop a planning strategy to improve mobility, circulation, and safety within the Ganado/Burnside area. The primary purpose for this study is to develop a comprehensive, transportation long-range plan that can provide guidance to the Ganado Chapter, Navajo Nation, Apache County District II, and ADOT when making future land use and multimodal transportation decisions. The need for this study stems directly from the desire of the Ganado Chapter and Apache County District II to increase economic vitality, improve community livability, and enhance transportation conditions along the area's major routes. Recommendations in this study will enable ADOT, Apache County District II, and the Navajo Nation to facilitate safer and more efficient infrastructure for the traveling public and guide the development along the study roadways. The purpose of the project is demonstrated with the following statements of need:

- **Address Safety, Mobility, and Operational Needs.** The current roadway network needs to be evaluated to identify solutions to improve safety and mobility, optimize traffic operations, develop maintenance procedures, and to enhance the overall streetscaping. Key issues that need to be addressed include:
 - Existing roadway and intersection design is not optimal, as commuter and school bus traffic often causes congestion and unsafe conditions.
 - Roadways need to be upgraded to meet BIA design standards.
 - Roadways lack shoulders which limit vehicles from pulling over or yielding to emergency vehicles.
 - Vehicles travel at high speeds, particularly in school zones, causing unsafe driving and walking conditions.
 - The area has limited pedestrian walkways, crosswalks, bicycle facilities, and trails.
- **Provide Bicycle, Pedestrian, and Trail Connections Between Activity Centers.** Sidewalks and bike paths are limited and unsafe within numerous locations of the study area. Improvements are necessary to provide continuous and safe connections between business and activity centers for residents and for recreational purposes.
- **Promote Economic Growth and Community Livability.** A plan for transportation investments that encourages economic growth while maintaining the cultural and historic nature of the study area needs to be developed. Transportation investments that provide multimodal, transportation choices and connections at the local and regional level that can spur business growth and job creation, provide much needed transportation for the underserved area, encourage physical activity, and promote tourism.
- **Accommodate Planned Growth.** As development occurs within the study area, the demand for safe transportation options will significantly increase and will require upgrades to facilities to accommodate traffic and to promote multimodal transportation.

Why is This Plan Needed?

ADDRESS SAFETY AND OPERATIONAL NEEDS

The roadway network needs to be evaluated to identify solutions to improve safety, mobility, and to optimize traffic operations

PROVIDE PEDESITRAN, BICYCLE, AND TRANSIT OPTIONS

Improvements are necessary to provide continuous and safe multimodal travel options between activity centers

PLANNED LAND USE AND FUTURE GROWTH

Planned growth will require updated facilities to accommodate traffic and to promote multimodal transportation

PROMOTE ECONOMIC GROWTH AND COMMUNITY LIVABILITY

Develop a plan for investments that strengthens local businesses, spurs business growth, encourages activities, and promote tourism



GOALS AND OBJECTIVES

With the overall goal to improve safety and mobility, the primary goals and objectives of this study are:

PRESERVE TRANSPORTATION INFRASTRUCTURE

- Identify roads that need pavement preservation and safety enhancements
- Recommend operational improvements to existing intersections and access to activity centers

IMPROVE CONNECTIVITY AND MOBILITY

- Increase the connectivity of all modes
- Increase access to activity centers
- Provide alternative routes

ENHANCE SAFETY FOR ALL MODES

- Conduct traffic analysis to determine future traffic conditions
- Recommend roadway safety elements
- Improve access management

FOSTER LIVABILITY, QUALITY OF LIFE AND SUSTAINABLE DEVELOPMENT

- Coordinate with desired community development patterns
- Support area economic developments

INCREASE MULTIMODAL OPTIONS

- Identify areas that need sidewalks, multi-use paths, and bike routes
- Enhance non-automobile modes for travel and recreation

OPTIMIZE INVESTMENT STRATEGIES

- Consider cost-effectiveness and constructability
- Identify funding sources and strategies

TECHNICAL ADVISORY COMMITTEE

The study is guided by a Technical Advisory Committee (TAC). The role of the TAC is to provide guidance, support, advice, suggestions, recommendations, and to perform document reviews throughout the study process. TAC members include representatives from:

- Apache County District II
- Ganado Chapter
- Ganado Chapter Farm Board
- Ganado Chapter Planning Department
- Ganado Unified School District
- Ganado Fire District
- BIA Fort Defiance Agency
- Navajo Transit System
- Navajo Nation Division of Transportation
- Navajo Nation Division of Economic Development
- Navajo Nation Division of Community Development
- Navajo Nation Division of Public Safety
- Navajo Nation Division of Agriculture
- Navajo Nation Historic Preservation Office
- Sage Memorial Hospital
- Indian Health Service
- Arizona Department of Health Services
- FHWA Arizona Division
- ADOT Flagstaff District Office
- North Arizona Council of Governments (NACOG)
- ADOT Holbrook Engineering District
- ADOT Multimodal Planning Division



STAKEHOLDERS

To develop a thorough understanding of the issues, deficiencies, and needs, the study team identified and interviewed a core group of stakeholders. The stakeholders included representatives from all Navajo Nation divisions and offices, Apache County District II, BIA Western Regional Office, Sage Memorial Hospital, Ganado Unified School District, NACOG, and ADOT Holbrook District. The first set of stakeholder interviews were conducted on Tuesday, March 3, 2015. At each stakeholder meeting, a questionnaire was given to participants and a roundtable discussion took place to identify key issues within the study area. Appendix A provides a detailed list of the stakeholders, questionnaire distributed during the meeting, and a summary of the comments received.

PUBLIC OUTREACH

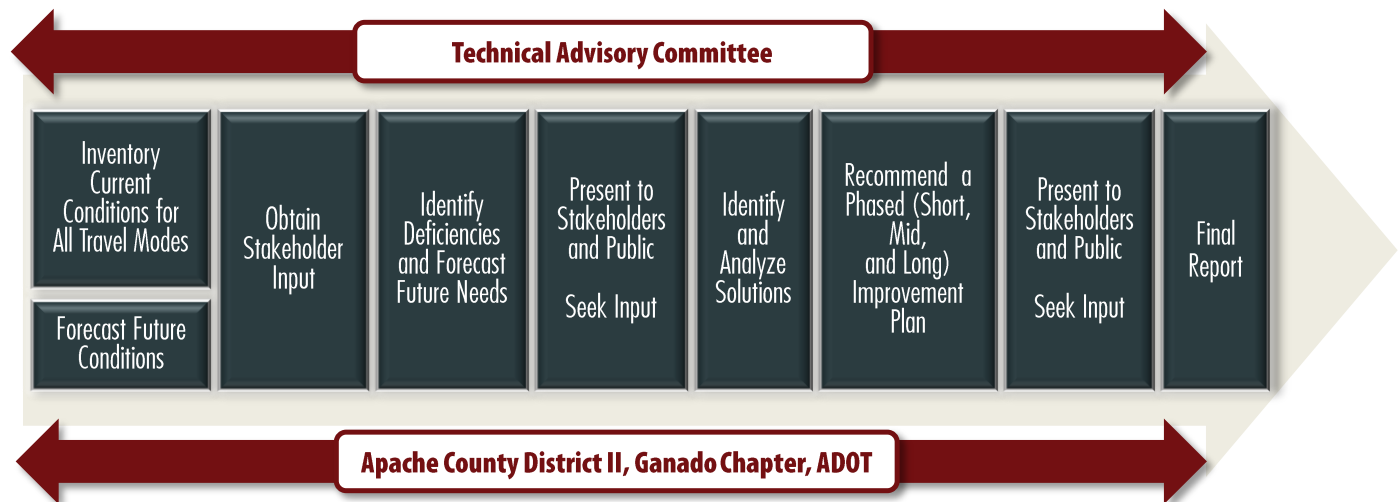
Public involvement is essential to the broad acceptance and successful implementation of any transportation improvement plan. The goal of community outreach is to educate the public about the study, provide opportunities for input, and to create a process to build consensus in support of study recommendations. For this study, the project team will conduct a two phase public outreach process to discuss the study area's issues and concerns and attain public input. Each step of the public involvement process includes informational materials such as presentation boards and handouts. A project website was also created to distribute project information to individuals with internet access.

Phase I of public outreach efforts will introduce the project to the public with a focus on existing and future conditions. The purpose of the meeting is to discuss the deficiencies and needs of the study area, and elicit input on the public's "vision" for the future of the area. The meeting is scheduled to take place on May 27, 2015. Phase II will present the draft transportation improvement plan in order to receive feedback and fine tune the study recommendations.

STUDY PROCESS

The development of a transportation plan is a technical, collaborative process that involves local jurisdictions, regional agencies, stakeholders, and the general public. For this study, six key stages are followed in order to ultimately develop a regionally cohesive improvement plan. Throughout the process, the study team will maintain consistent contact with the TAC, and stakeholders and will include extensive public outreach efforts. Figure 1.2 illustrates the process that is utilized for this study.

Figure 1.2. Study Process



2. PREVIOUS STUDIES, REPORTS, AND PLANS

This chapter presents a review of studies, plans, and programs relevant to this study. Review of completed and current planning efforts often provides an insight into previously identified transportation issues and potential transportation improvements. This chapter also summarizes approved future transportation improvements within the study area.

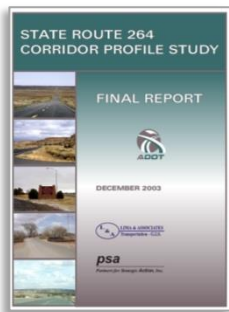
ONGOING AND COMPLETED STUDIES



1999 US Highway 191 Engineering Feasibility Study

This study was originally conducted to evaluate different alternatives to provide a four-lane divided highway and to improve safety and operational capacity on US 191 from Burnside Junction (MP 417.5) to MP 427. Major recommendations included:

- From MP 171.55 to 417.74 – widen roadway to a five-lane fringe urban roadway with four lanes and continuous left turn lane and 8 FT shoulders.
- From MP 171.745 to 427.0 – widen roadway to a four-lane roadway with a 46 FT wide median dividing the travel lanes.



2003 State Route 264 Corridor Profile Study

Identified as a transportation corridor of statewide significance, ADOT conducted this study in order to have a strategic plan for improving the corridor’s multimodal transportation system.

- SR 264 from Burnside to Ganado is projected to operate at a 2020 level of service D and has the highest crashes rates along the corridor. Within our study area widening shoulders, reducing traffic congestion, and improving structures were identified as high priorities along the corridor.
- Major recommendations included:

Location (MP)	Recommended Improvement
SR 264/US 191 North Intersection	Intersection illumination, widen intersection for turn lanes, install pedestrian signage, potential transit stop at Chevron Gas Station and Standing Rock
441.0 - 441.8	Widen to Five-Lane Cross Section with Curb/Gutter/Sidewalk
441.8 – 444.7	Widen to Four-Lane Divided Cross Section
444.23	Bridge Rehabilitation
444.7 – 446.2	Widen to Five-Lane Cross Section with Shoulders
446.2 – 446.89	Widen to Five-Lane Cross Section with Curb/Gutter/Sidewalk, potential transit stop in front of Ganado Post Office
446.2	Bridge Rehabilitation
440.9 – 447.6	Pavement Rehabilitation and Guardrail Replacement
SR 264/US 191 Highway South Intersection	Intersection illumination
446.89 – 447.6	Widen to Five-Lane Cross Section with Curb/Gutter/Sidewalk
447.6 – 448.6	Widen to Five-Lane Cross Section with Shoulders
Corridor Wide	Bus bays with shelters should be constructed at all major “road stops” and for school buses, Conduct park-and-ride feasibility study to determine if transit demand in Ganado warrants the service

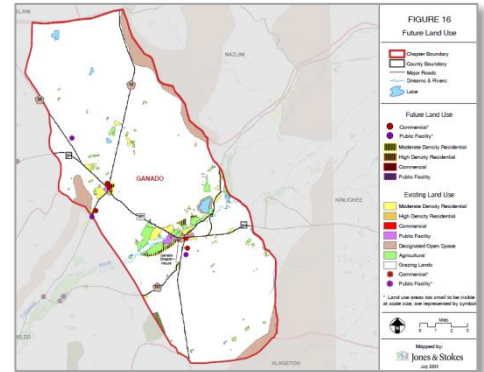




2003 Navajo Nation Community Land Use Plan – Ganado Chapter

The Community Land Use Plan (CLUP) for Ganado Chapter includes a land use, utility, and transportation system plan that the Chapter can utilize to guide development. Major relevant findings and recommendations included:

- Most of the Ganado residents reside in either (1) Central Ganado corridor, from just west of the Chapter House through the Sage Hospital and schools area, to the area south of Ganado Lake; or (2) near Burnside Junction.
- Potential growth areas were identified as:
 - Burnside Junction site is suitable for a mixed used site that could accommodate up to 135 homes as well as administration buildings for the Sage Memorial Hospital. The development would require two access roads – one entering from SR 264 and one from US 191.
 - East Ganado Site (northwest of N27 and SR 264) is a 10 acre site that would accommodate 27 homes as well as ancillary buildings for the Sage Memorial Hospital.
 - Potential for residential land along the SR 264 and US 191 South corridors.
 - Commercial development is recommended to be concentrated at the two activity centers of Central Ganado and Burnside Junction. Developments requested by Chapter members included businesses that provide employment opportunities, a bank, hotels and restaurants, supermarket, and other commercial properties.
- Local priority roadway improvements include the Ganado North Mesa Road (N9201), Ganado Loop Access Road, and the Old Round Top Road (N9202).

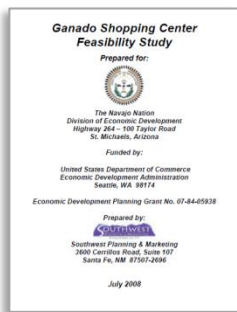


2004 State Route 264 Feasibility Study

This Feasibility Study was conducted to prepare a long-range plan to upgrade SR 264 from Burnside Junction eastward through Ganado to the intersection with Kinlichee Chapter House Road (MP 441.1 to MP 452.4). Major relevant findings and recommendations included:

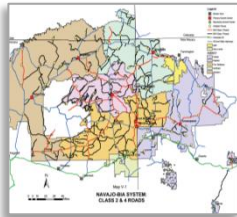
- SR 264 is the primary link for local residents in Ganado and Burnside and serves as the Main Street for the communities. In addition, the route is a major regional travel corridor for tourists going to Hubble Trading Post and Canyon de Chelly National Monument.
- The pedestrian overpass on SR 264 is rarely utilized, as students and residents cross the highway at-grade. Non-climbable fencing is not feasible in the area; therefore, it was recommended to remove the overpass.
- Burnside Junction (MP 441.1 – MP 441.8) – widen to a four-lane roadway with a center turn lane.
- MP 441.8 – MP 444.7 – widen to a four-lane divided highway with a 46 FT median.
- MP 444.7 – MP 448.7 – widen to a four-lane roadway with a center continuous left-turn lane.
- East of Ganado (MP 448.7 – MP 452.4) – widen to a four-lane divided highway with a 46 FT median.





2008 Ganado Shopping Center Feasibility Study

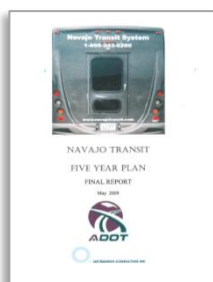
The Navajo Nation Division of Economic Development conducted this study to determine the feasibility of a shopping center in Ganado as a potential economic opportunity for reducing spending in other towns, increasing tax revenue, and creating local jobs. The study evaluated the northwest quadrant of the SR 264 and US 191 intersection in Burnside. Analysis found that the market area, which includes nearby Chapters within 12 miles, can support a commercial space that includes a grocery store, hardware and automotive supply store, a laundry, fast food and family restaurant, medical office, and other retail businesses. In a community-wide survey, respondents commented that they shop 3 to 4 times a month and typically drive to Gallup or Window Rock for shopping purposes.



2009 Navajo Nation Long Range Transportation Plan

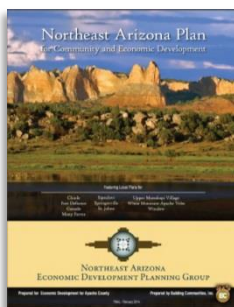
The 2009 Navajo Nation Long Range Transportation Plan identified the Navajo Nation's multimodal transportation needs for the next 20 years, in conjunction with development strategies for implementing improvements. The study was based on a comprehensive analysis of existing and future transportation needs throughout the Navajo Nation. The Ganado area was identified in the study as a secondary growth center within the Nation. Key study findings and recommendations include:

- Ganado Airport mostly serves medical transportation to and from the Sage Memorial Hospital. A master plan and initial design (2008) for a 6,600' x 75' paved runway has been completed.
- Sidewalks and pedestrian crosswalks are needed on SR 264 at milepost 446.9.
- Fencing is needed on US 191 from Klagnetoh to Ganado.
- SR 264 from N27 to the Hubble Trading Post has one of the highest crashes rates in the Nation. In addition the intersections of SR 264/US 191 North and SR 264/US 191 South were identified as intersections with significant safety concerns.
- Numerous residential and commercial developments are planned in both Ganado and Burnside.



2009 Navajo Transit System Five-Year Plan

The Navajo Transit System Five-Year Plan was a Nation-wide assessment of the current transit needs and service deficiencies of the Nation. The Transit Plan provides a roadmap for future transit services to better accommodate current users and for future ridership in the coming years. The study analyzed ridership characteristics within the Nation and found that the majority of riders were adults that utilized transit for employment purposes. The study identifies Ganado as potential location for a transit center. The goal of the transit center would be to have a meeting place for riders and drivers to meet.

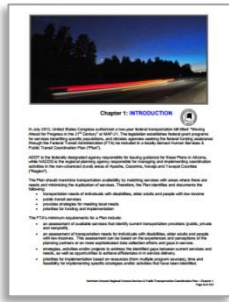


2013 Ganado Economic Development Strategic Plan and 2014 Northeast Arizona Plan for Community and Economic Development

Conducted by the Northeast Arizona Economic Development Planning Group to develop a Regional Sustainability Plan for Northeast Arizona, this study provides a strategic plan for the next three to five-years. Key study findings included:

- Based on a community meeting education development, pass-through visitor services, cultural and local/regional tourism, and attractions were the primary sectors the public would like to pursue.
- The studies steering committee determined that the four strategies that would most advance the economic conditions and overall quality of life in Ganado are: attracting government funding, business recruitment, cultural tourism, and pass-through visitor services.





2014 Northern Arizona Regional Human Services & Public Transportation Coordination Plan

NACOG completed this study in order to compile with MAP-21's regulations that agencies seeking federal funding assistance through the Federal Transit Administration be included in a locally derived Human Services Coordination Plan. Potential human service transportation activities in the study area include :

- Toyei Industries is a residential program located in Ganado that provides day treatment, home, and community based services. Transportation needs for the program include access to therapeutic programs, education trips, medical needs and emergency transportation.
- Annie Wauneka Life Care (AWLC) is a non-profit organization in Ganado and Cornfields that provides community-based, non-skilled care services to Navajo adults. AWLC provides transportation for a variety of client needs, including shopping, community activities, medical, and home visits.

PROGRAMMED AND SCOPED PROJECTS

ADOT's Multimodal Planning Division publishes the Arizona State Transportation Improvement Program (STIP), which identifies priority transportation projects that utilize federal funds over a five-year timeframe. The ADOT MPD Planning and Programming section compiles the STIP from a list of projects from regional transportation improvement programs (TIP). Table 2.1 lists the improvement projects included in the *2015-2019 State Transportation Improvement Program*. The Five-Year Program acts as a guiding document for future projects and designates the allocation of local, state, and federal funding for projects. Funding of the Five-Year Program is generated primarily through the gasoline and vehicle license tax. No projects were listed in the *NACOG Regional Transportation Improvement Program* or the *Five-Year Airport Capital Improvement Program* for the study area.

Table 2.1. ADOT State Transportation Improvement Program FY 2015 – 2019

Year	Project Location	Type of Improvement, Equipment, Structure, etc.	Total Costs
2016	SR 264: MP 441 – MP 450	Fence and Cattle Guards & Turn Lanes	\$800,000
2016	SR 264: MP 441 – MP 450	Pavement Preservation	\$4,000,000
2016	SR 264: MP 441 – MP 450	Construct Shoulder Widening	\$10,300,000
2016	SR 264: Ganado Wash Bridge	Bridge Replacement	\$5,000,000

Source: ADOT Multimodal Planning Division

Note: Please note that the above projects are based on the current ADOT STIP. Some of the projects scheduled may already be complete.

Table 2.2 lists the roadway improvement projects in the study area as identified in the Tribal Transportation Program

Table 2.2. Tribal Transportation Program FY 2015 – 2019

Year	Project Location	Type of Improvement	Total Costs
2015	N15: Burnside to Greasewood Springs	Install Fencing	\$5,100,000
2017	N15: SR 154 to Cornfields-Sunrise	Grade, Drain, and Surfacing (Pavement) Construction	\$10,530,000

Source: ADOT Multimodal Planning Division



STATE ROUTE 264 PROGRAMMED IMPROVEMENTS

ADOT is currently in the process of conducting a safety and pavement preservation project on SR 264 from MP 441 to MP 459.0. With the ultimate purpose of improving roadway conditions and the overall safety of the corridor, these improvements seek to reduce the frequency and severity of crashes. The project consists of:

- Overlaying 2.5 inch asphalt concrete overlay and 0.5 inch asphalt concrete friction course
- Widening the roadway to provide adequate shoulders
- Installing centerline and shoulder rumble strips
- Flattening side slopes
- Installing guardrails
- Extending drainage structures
- Providing delineators and recessed pavement markers.

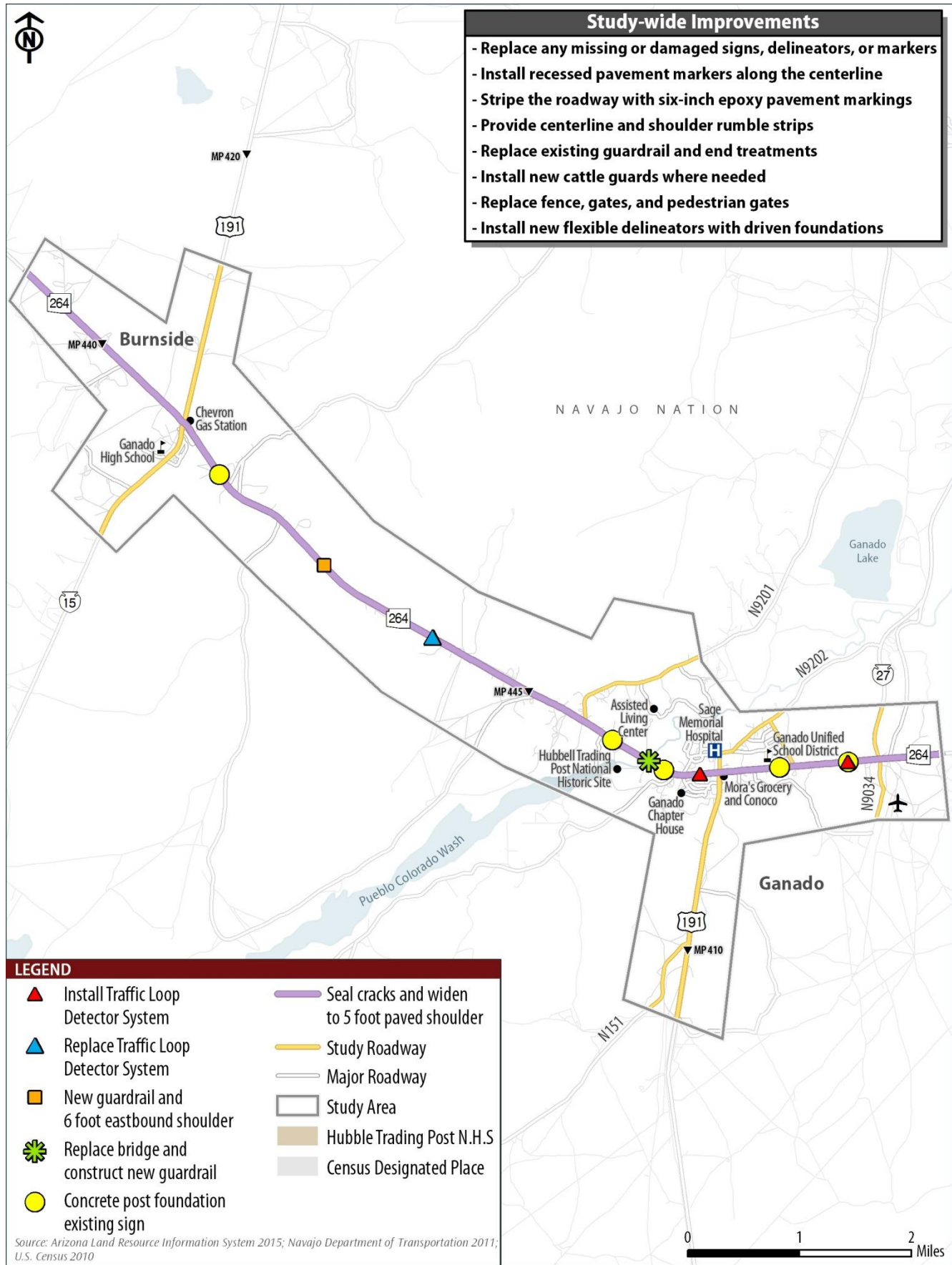
Using the AASHTO Highway Safety Manual (HSM) Predictive Method and the Interactive Highway Safety Design Model (IHSDM), Benefit/Cost ratios were analyzed for widening shoulders. Per findings, it was recommended to install 5 FT shoulders to maximize expected benefits. Table 2.3 and Figure 2.1 summarize the safety and pavement preservation improvements.

Table 2.3. Planned State Route 264 Improvements

Roadway Improvement	Project Location
Pavement Preservation	
Seal existing cracks in the roadway	Study-wide
Mill the roadway for vertical tapers	Study-wide
Overlay the existing full width roadway with AC and AR-ACFC surface course	Study-wide
Overlay paved and permitted turnouts with AC, fog coat, and a blotter material	Study-wide
Install recessed centerline pavement markers and rumble strips	Study-wide
Stripe roadway with six-inch epoxy pavement markings	Study-wide
Safety Improvements	
Widen roadway symmetrically to provide 5 foot shoulders	Study-wide
Saw cut one foot from existing edge of pavement for widening joint	Study-wide
Construct guardrail and provide 6 foot shoulder for culvert	MP 442.8
Extend existing cross drainage structures impacted by widening improvements	Study-wide
Grade to drain where needed	Study-wide
Replace guardrails	Study-wide
Provide shoulder rumble strips	Study-wide
Install new flexible delineators with driven foundations	Study-wide
Replace signs and install cattle guards as necessary	Study-wide
Remove and replace fence, gates, and pedestrian gates	Study-wide
Seed all disturbed areas	Study-wide
Replace bridge and guardrail	Ganado Wash Bridge
Replace Traffic Loop Detector System (Type C)	MP 444.0 and MP 448.0
Install Traffic Loop Detector System (Type SA)	MP 446.7
Construct concrete post foundation for existing sign (Jct. 191/15 1/2 mile)	MP 441.5
Construct concrete post foundation for existing sign (Hubbell Trading Post 1/2 mile)	MP 445.9
Construct concrete post foundation for existing sign (Jct. 191 1/2 mile)	MP 446.4
Construct concrete post foundation for existing sign (Jct. 191 1/2 mile)	MP 447.4
Construct concrete post foundation for existing sign (End Headlight Use)	MP 448.0
Construct concrete post foundation for existing sign (Use Headlights)	MP 448.0



Figure 2.1. Planned State Route 264 Improvements



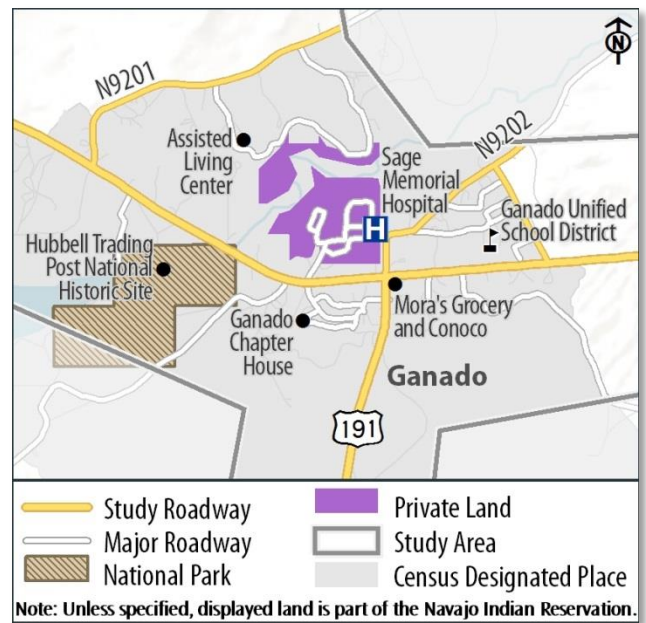
3. LAND USE AND SOCIOECONOMIC CONDITIONS

This section summarizes current and future land use and socioeconomic conditions for the study area.

LAND OWNERSHIP

The entire study area is located within the Navajo Nation Indian Reservation. Land within the Navajo Nation is primarily communally owned and administered by the Nation's government; however, customary land users may lease land for home sites, grazing, and other uses. Organizations such as the BIA, other federal agencies, churches and other religious organizations, and businesses, may also lease land. Additional land owners in the study area include:

- Located off of N427 south of SR 264, is the National Park Service owned and maintained Hubbell Trading Post National Historic Site.
- Sage Memorial Hospital occupies over 109 acres of private land northwest of the SR 264 and US 191 South intersection.



EXISTING LAND USE

Integrating land use into transportation planning is essential so communities can support "smart growth" processes and promote sustainable development. Sustainable development improves mobility, supports economic growth, and ensures the financial stability of the transportation system. This approach helps maintain the quality of living for the people and the quality of the community as a whole and also reduces the need for roadway expansion. Existing land use data was compiled based on existing planning documents and a comprehensive field review. Figure 3.1 illustrates major activity centers and the existing land use per the *Ganado General Plan*. As shown in Figure 3.1, the land use categories within the study area are:

- **Residential:** Approximately 14.6% of the study area is utilized for residential purposes. According to the *Ganado General Plan*, residential land uses include moderate density (between 100 and 500 persons per square mile) and high density (over 500 persons per square mile).
 - High density residential areas are located: southwest of SR 264/US 191 South intersection, on N9201, on N9202, and on N15
 - Moderate density residential areas are located: southwest of the Ganado High School, southwest of the ADOT Maintenance Yard, along SR 264 in Ganado, on N9201, and on N9202.
- **Commercial:** Commercial services in Ganado include the Hubble Trading Post National Historic Site, the Conoco Gas Station and Mora's Grocery at the SR 264/US 191 South intersection and TJ's Automobile Repair south of SR 264 east of Ganado. While the Hubbell Trading Post is a United States National Park Service facility and a tourist attraction, it also contains retail operations for crafts and groceries. Burnside has a small commercial plaza northeast of the SR 264/US 191 North intersection that includes Burger King and Chevron Gas Station.
- **Public Facility:** Public facilities within the study area include the Ganado High School in Burnside, Ganado Unified District, Northern Arizona University, ADOT maintenance facility, and Apache County District II Administration offices. The Navajo Nation facilities include the Chapter House, a fire station, the Navajo Head Start Program, and Navajo Housing Authority offices. The Sage Memorial Hospital complex is a 98 acre site on owned fee simple land leased by the hospital.

- **Agriculture:** According to the *Ganado General Plan* agricultural land occupies roughly 270 acres of the study area. While agricultural land is scattered throughout the study area, a large continuous land area southwest of Ganado is designated as agricultural.
- **Designated Open Space:** Located southwest of the Ganado High School, the Navajo Nation Department of Fish and Wildlife has established a Designated Open Space area. This area is noted in the Ganado General Plan as an area of high sensitivity. proposed development

PLANNED DEVELOPMENTS

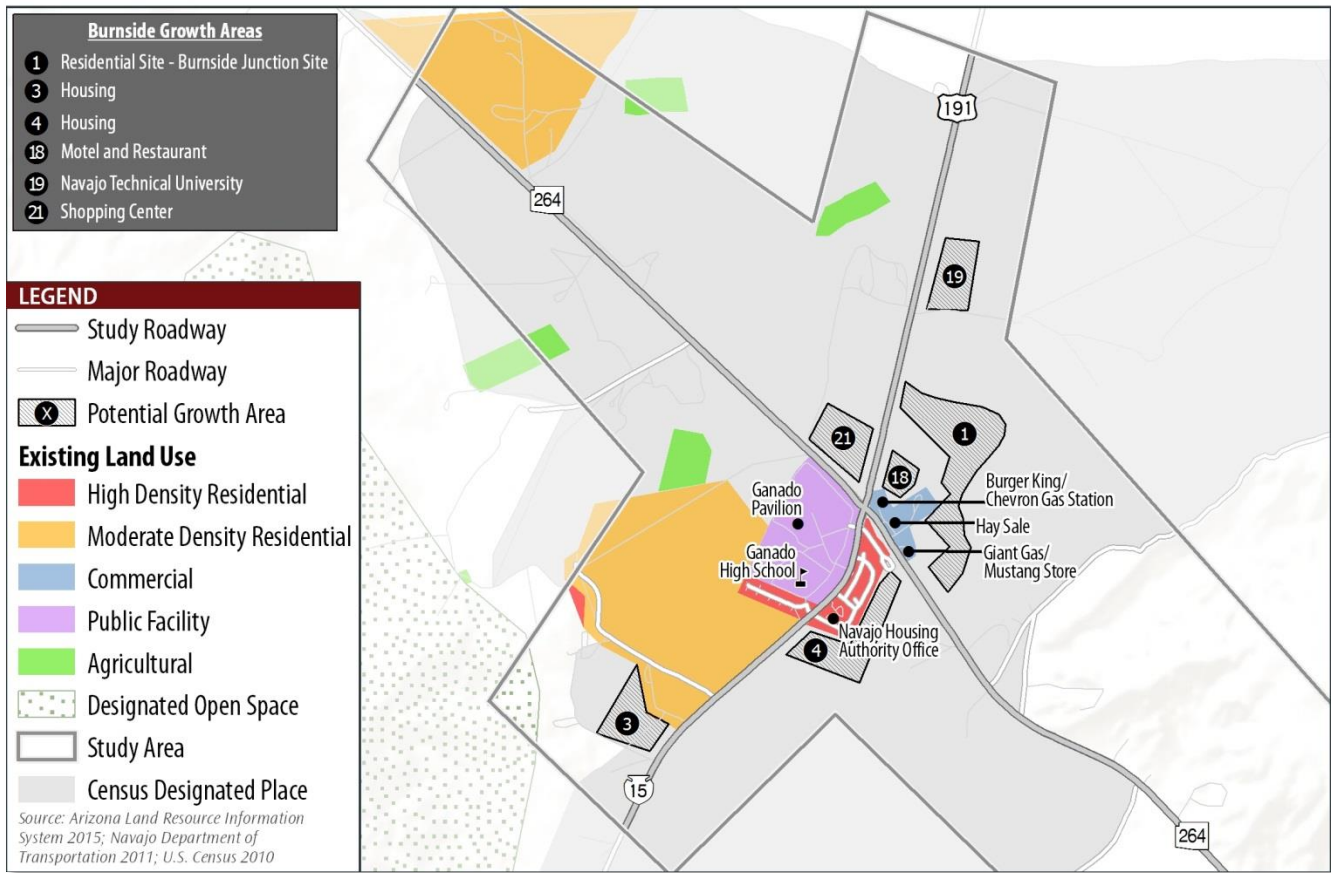
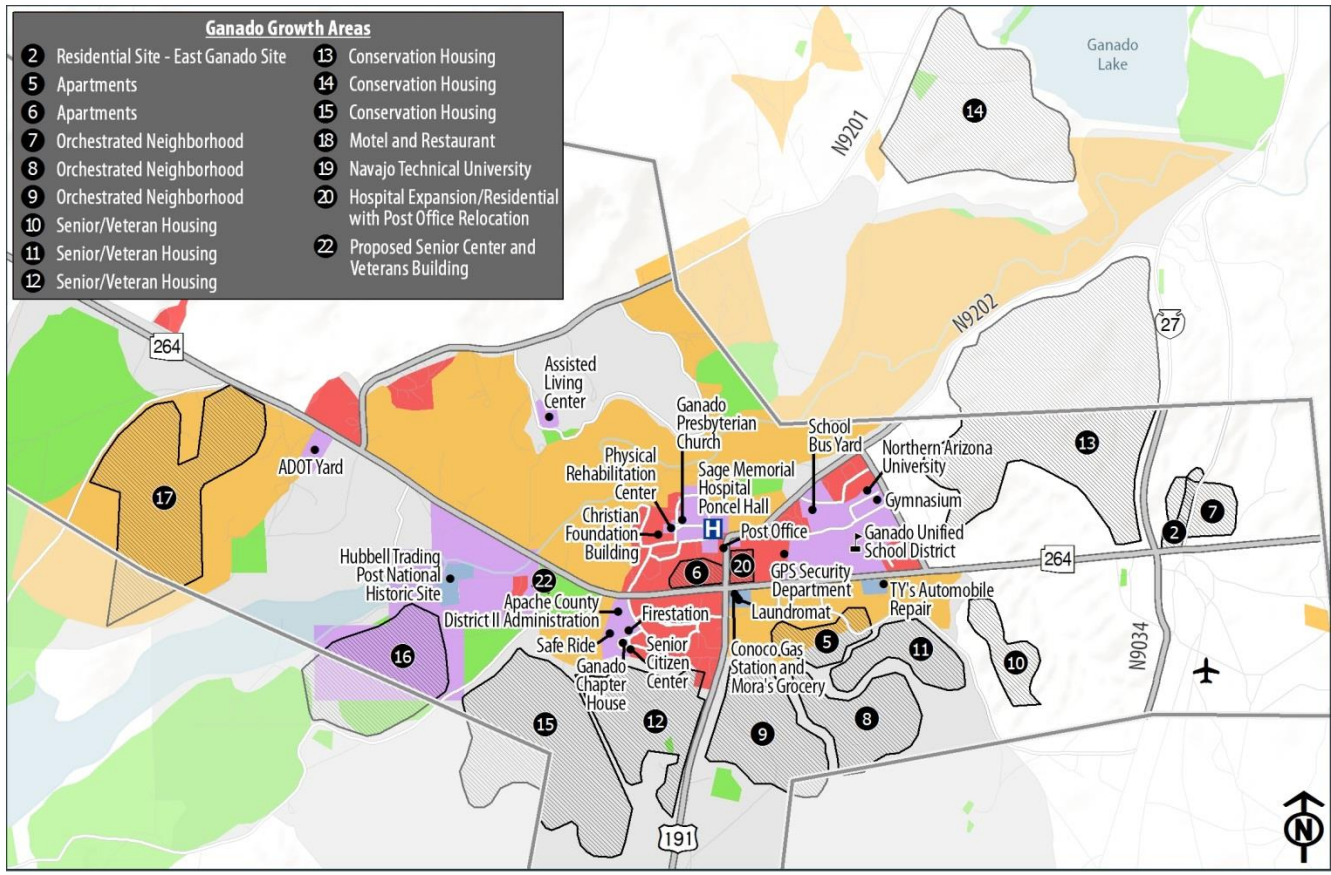
Based on input received from local stakeholders and TAC members, planned developments and potential timeframes for development were identified. Table 3.1 presents potential future developments within the study area, while Figure 3.1 illustrates the locations of the planned developments.

Table 3.1. Potential Study Area Developments

#	Proposed Development	Location	Units	Timeframe
1	Residential - Burnside Junction Site	Northeast of Burger King and Chevron	20-30	10-20 years
2	Residential - East Ganado Site	Northeast corner of SR 264 / N9034 Intersection	27	Unknown
3	Housing	Southwest of Ganado High School	Unknown	0-5 years
4	Housing	South of Navajo Housing Authority Office	Unknown	Unknown
5	Apartments	Southeast of Conoco Gas Station	57	Unknown
6	Apartments	Northwest corner of SR 264 / US 191 South Intersection	57	Unknown
7	Orchestrated Neighborhood	Northeast corner of SR 264 / N9034 Intersection	14	Unknown
8	Orchestrated Neighborhood	Southeast of Conoco Gas Station	41	Unknown
9	Orchestrated Neighborhood	South of Conoco Gas Station	69	Unknown
10	Senior/Veteran Housing	Southeast of TY's Automobile Repair	73	Unknown
11	Senior/Veteran Housing	South of TY's Automobile Repair	96	Unknown
12	Senior/Veteran Housing	South of Ganado Chapter House	191	Unknown
13	Conservation Housing	West of N27	185	Unknown
14	Conservation Housing	East of N9201 (outside of study)	82	Unknown
15	Conservation Housing	Southwest of Ganado Chapter House	82	Unknown
16	Conservation Housing	South of Hubbell Trading Post	63	Unknown
17	Conservation Housing	West of ADOT Yard	174	Unknown
18	Motel and Restaurant	North of Burger King	Unknown	0-5 years
19	Navajo Technical University	East of US 191 in Burnside	Unknown	Unknown
20	Possible Hospital Expansion/ Residential with Post Office Relocation	Northeast corner of SR 264 / US 191 South Intersection	20	0-5 years
21	Shopping Center	Northwest corner of SR 264 / N15 Intersection	33 acres	1-2 years



Figure 3.1. Land Use and Growth Areas



EXISTING SOCIOECONOMIC CONDITIONS

A review of existing population and employment was conducted to understand the demographic characteristics of the Ganado/Burnside area. As identified by the US Census Bureau, Table 3.2 summarizes the population and occupied housing unit growth trends from 2000 to 2010 for the study area, Ganado Census Designated Place (CDP), Burnside CDP, Apache County, and the State of Arizona. It is evident that the population has dramatically decreased since the 2000 Census. As shown in the Table, the Ganado/Burnside area has lost nearly 21 percent of the population recorded in the 2000 US Census. This significant decrease in population may be attributed to Navajo Nation members moving to urban areas to seek employment or errors in reporting. According to the US Census Bureau, the entire Navajo Nation lost three percent of their population.

Table 3.2. Population and Occupied Housing Unit Growth Trends

Geographic Area	Population		Population Growth	Occupied Housing Units		Housing Units Growth
	2000	2010		2000	2010	
Study Area	2,258	1,854	-17.89%	625	561	-10.25%
Ganado CDP	1,505	1,210	-19.60%	422	372	-11.85%
Burnside CDP	632	537	-15.03%	173	160	-7.51%
Apache County	69,423	71,518	3.02%	19,971	22,771	14.02%
State of Arizona	5,130,632	6,392,017	24.59%	1,901,327	2,380,990	25.23%

Source: 2010 US Census, 2000 US Census

Figures 3.2 and 3.3 illustrate the total population and occupied housing units per square mile, respectively. As illustrated in Figure 3.2, population densities are highest at the housing developments surrounding Ganado High School, north of the Ganado Unified School District, and along SR 264 in Ganado. Additionally, high concentrations of populations are located along N151, N9201, and west of Burnside. Areas with a lower housing density but higher population density suggest that the areas are comprised of dwelling units with a high occupancy rate.

Employment Overview

As a sovereign Nation, the Navajo Nation is responsible for the economic development, financial solvency, and general welfare of its members. ReferenceUSA data was compiled to identify primary employment industries and current employment levels within the study area. Based on the ReferenceUSA database, there are approximately 1,406 employees within the study area. Ganado Unified School District is cited as the largest employer within the community with 350 employees, while Sage Memorial Hospital employs over 280 persons. According to ReferenceUSA, the largest type of employers within the area are educational and health services.

Major Employer	Employees
Ganado Unified School District	350
Sage Memorial Hospital	284
R H Mike Enterprises (Owners of Burger King)	45
Annie Wauneka Life Care	32
Safe Ride Services Inc.	32

Source: ReferenceUSA 2014



Figure 3.2. Total Population per Square Mile

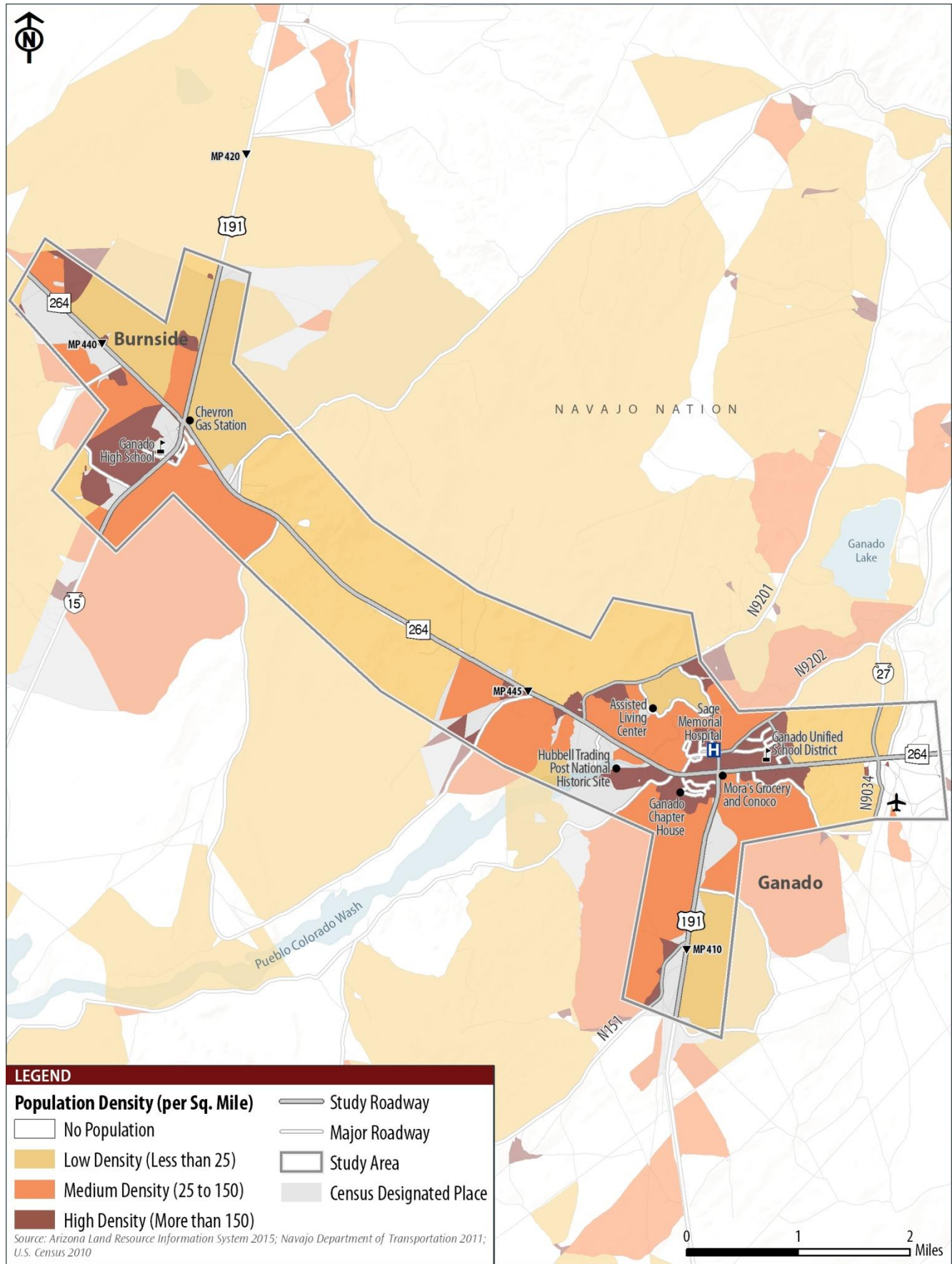
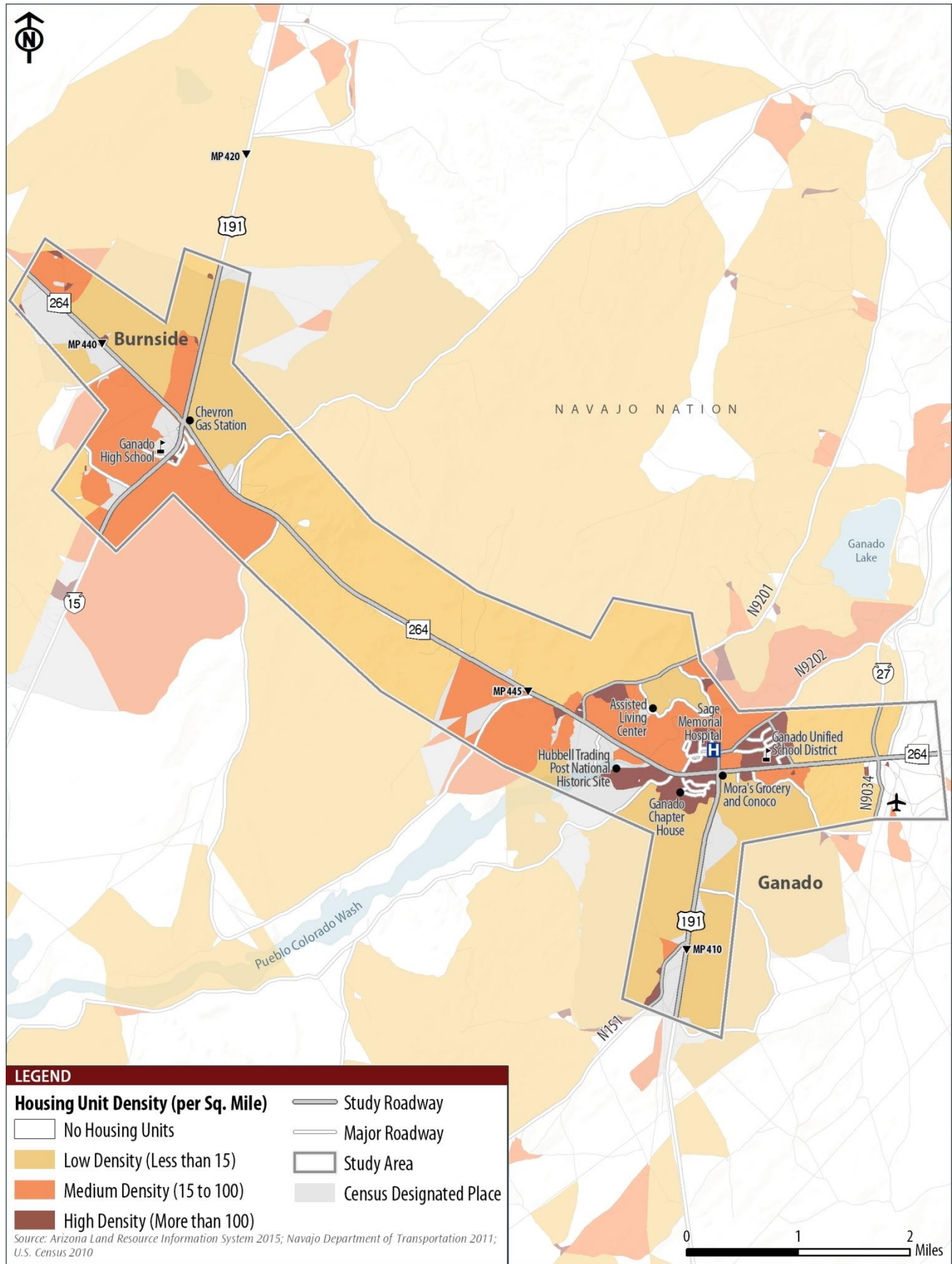


Figure 3.3. Total Occupied Housing Units per Square Mile



4. ENVIRONMENTAL OVERVIEW

Inventory of the physical, natural, and cultural environment is an important component of the transportation planning process. When environmental conditions and concerns are reviewed in the early stages of the transportation planning process, transportation solutions can be developed to avoid or lessen the negative impacts on the natural environment. This chapter presents a review of environmental conditions within the study area.

TOPOGRAPHY AND GEOLOGY

Located between Balakai Mesa and Defiance Plateau, the study area is located at the southern tip of Ganado Mesa. The study area elevation ranges from 6,300 to 6,800 feet and encompasses a terrain with numerous hills. The majority of the study area is comprised of geological type Late Triassic (TrC) but also includes Pliocene to middle Miocene (Tsy), Holocene to latest Pleistocene (Qy), and Holocene to middle Pleistocene (Q). According to the Arizona Geological Survey (AZGS), TrC consists of colourful mudstone, such as in the Painted Desert, and less abundant lenses of sandstone conglomerate, deposited by large river systems. This unit typically is eroded into badlands topography and contains clays that are prone to shrink and swell.

VEGETATION

The Ganado/Burnside study area contains the following vegetation communities:

- Great Basin Desertscrub - dominated by the presence of sagebrush, blackbrush, shadescale, and grasses
- Great Basin Conifer Woodland - mainly comprised of medium sized conifers, the pinyon pine and juniper
- Plains and Great Basin Grassland - primarily composed of mixed or short-grass communities

No formal inventory of native plants was conducted; however, native plants may occur within the study area. Native plants include the Navajo Mountain phlox, Navajo sedge, a variety of cacti, and numerous tree species. The Navajo Natural Heritage Program (NNHP) maintains a comprehensive database of rare and protected plants on the Navajo Nation. According to the NNHP, there are 63 sensitive plant species in the Navajo Nation, of which 19 are classified as endangered. As improvements are identified during the next phase of the study a detailed review will be conducted to identify impacts on protected plant species. Figure 4.1 illustrates the vegetation communities present within the study area.

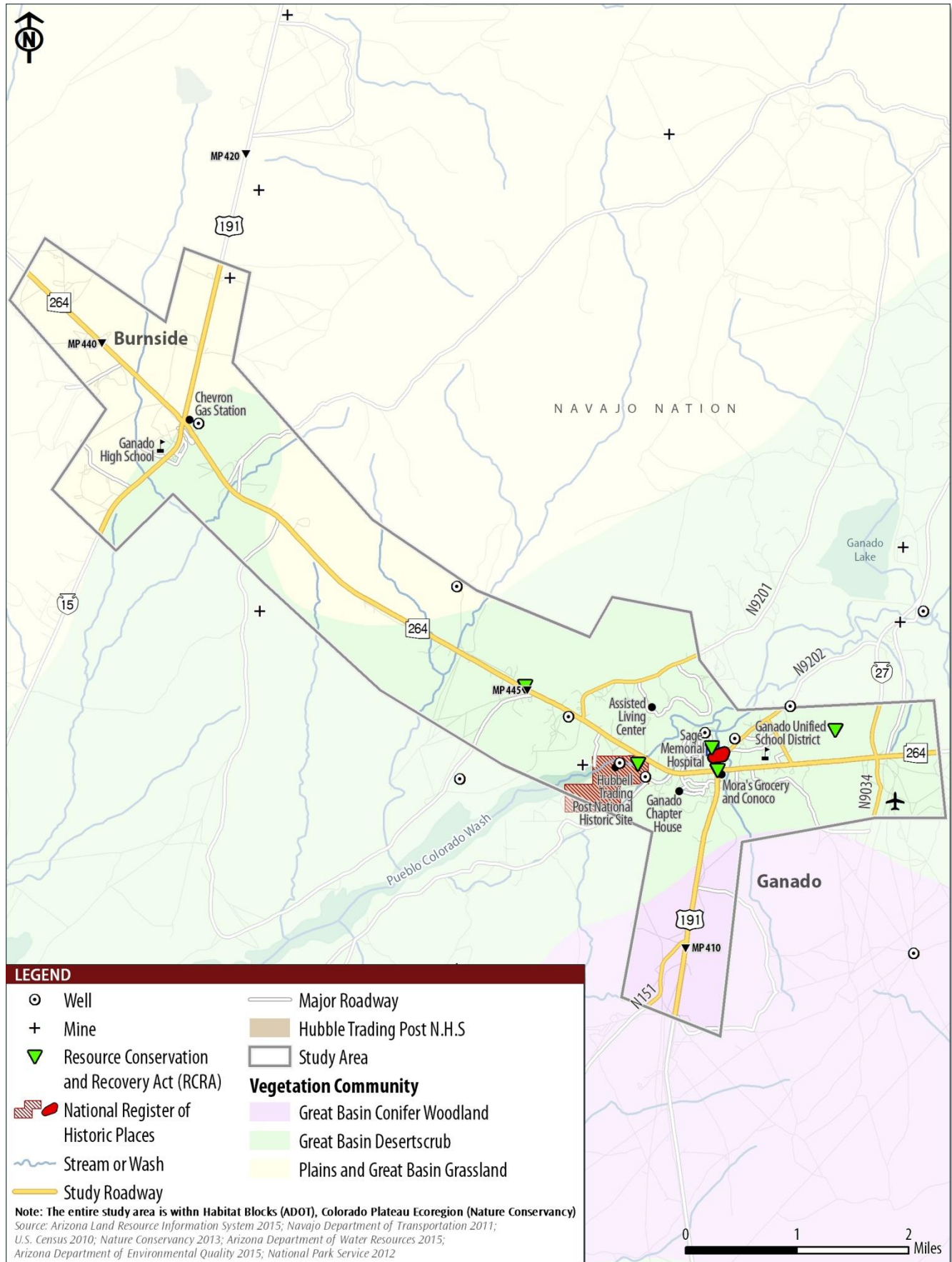
BIOLOGY

The Arizona Game and Fish Department (AGFD) Heritage Data Management System (HDMS) was accessed to determine special state species and threatened, endangered, and candidate species in the vicinity of the study area. Utilizing the HDMS online retrieval system, the following biological resources were identified:

- Critical habitat for Zuni bluehead sucker - northeast of the study area. In 2015, the US Fish and Wildlife Service extended the determination of the Zuni bluehead sucker as an endangered species.
- Section 10(j) area for the California condor – south of SR 260 and west of US 191 North. A Section 10(j) designation allow for the reintroduction of populations of listed species as "experimental populations" to determine if the experimental population is "essential" or "nonessential" for the continued existence of a species.



Figure 4.1. Environmental Overview



HYDROLOGY

Within the study area there is one major hydrological feature, Pueblo Colorado Wash, which runs northeast adjacent to the Hubbell Trading Post National Historic Site. After passing under the SR 264 Bridge, the wash continues between the Ganado Assisted Living Center and Sage Memorial Hospital. The U.S. Army Corps of Engineers (Corps) is authorized by Congress to provide flood protection, environmental stewardship, and civil works construction on the Reservation. Although flooding often occurs on the Navajo Nation, no federally sponsored flood control projects using the authority granted to the Corps have been constructed.

Floodplains

The Federal Emergency Management Agency (FEMA) has not conducted an official flood study of the Reservation to determine potential flood hazards; however, during the roadway inventory, flooding and drainage issues were identified on unpaved roadways throughout the study area.

Wetlands

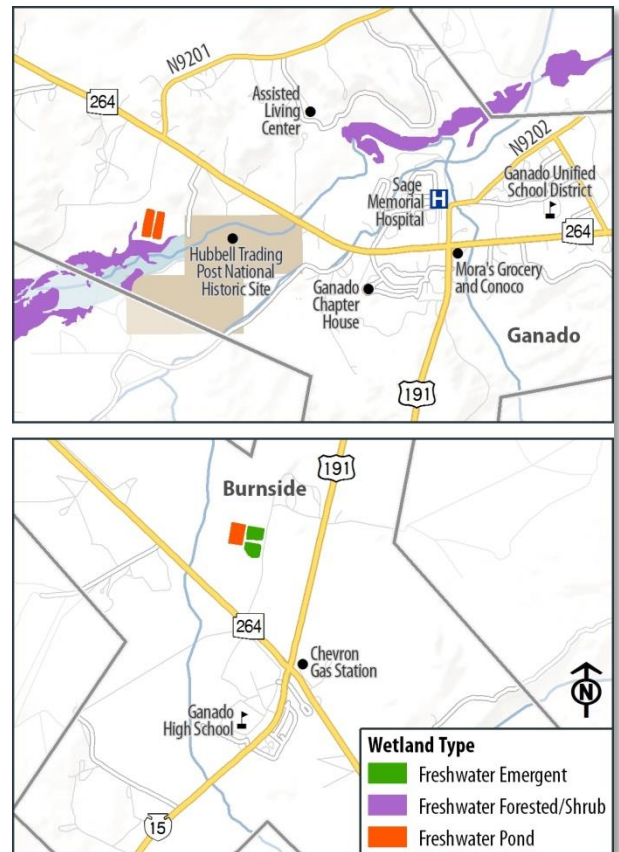
The United States Fish & Wildlife's National Wetlands Inventory indicates the following wetlands may be present in the study area:

- Freshwater forested/shrub wetlands may border the Pueblo Grande Wash
- Freshwater emergent wetlands may be present northwest of the SR 264/US 191 North intersection
- Freshwater pond wetlands may be present northwest of the SR 264/US 191 North intersection

Wetlands are defined by the Environmental Protection Agency (EPA) as lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Wetlands typically are areas where water covers the soil or is present at/near the surface of the soil year-round or during varying periods throughout the year.

Wells

Based on Arizona Department of Environmental Quality (ADEQ) and Arizona Department of Water Resources (ADWR) Wells 55 information databases, there are eight wells within the study area. In Burnside, one well is located by the Burger King / Chevron Gas Station commercial area. Wells in Ganado are located near the Hubbell Trading Post, Sage Memorial Hospital, and the Unified School District. Figure 4.1 shows the locations of the wells, and hydrological features surrounding the study area.



PRIME AND UNIQUE FARMLANDS

The Ganado/Burnside study area is in the Natural Resources Conservation Service's (NRCS) Soil Survey Geographic (SSURGO) Database soil survey area AZ 715. According to the NRCS survey, the study area contains no soils that support prime or unique farmlands or farmlands of statewide or local importance.

NOISE IMPACTS

Maintaining acceptable noise levels to preserve the character of open spaces, residential quiet zones, and recreational facilities should be considered when selecting a potential transportation improvement project. Schools, hospitals, residential development, and community uses requiring low noise levels are included in the list of potential noise-sensitive receptors.

There are numerous existing noise-sensitive receptors within the study area, including schools, Sage Memorial Hospital, community centers, religious facilities, and residential and housing communities. Potential future noise-sensitive receptors include possible Sage Memorial Hospital relocation facility, new residential and commercial developments, and the planned Apache County District II Administration Office. Potential noise generators within the study area include the major paved roadways, and the helicopter landing pad for the Sage Memorial Hospital. Future noise impacts may occur as a result of improvements on the airport adjacent to N9034 and as a result of commercial development.

AIR QUALITY

Based on data provided by the ADEQ, air quality in the study area meets the National Ambient Air Quality Standards (NAAQS) set forth by the Clean Air Act (CAA) for criteria pollutants carbon monoxide (CO), nitrogen dioxide (NO₂), ozone, particulate matter less than or equal to 2.5 microns or 10 microns (PM_{2.5} and PM₁₀, respectively), and sulfur dioxide (SO₂).

UTILITIES

The Navajo Tribal Utility Authority provides the Ganado/Burnside study area with a full range of utilities including electricity, water, wastewater, and natural gas. Navajo Sanitation also provides residential and commercial trash removal to the Ganado Chapter. Telephone service is provided by Navajo Communications Company, Inc., and cellular telephone service is available through private cellular companies. Stakeholders commented that a new natural gas line and a 4G cellular tower are planned to be constructed in the study area in the near future.

HAZARDOUS MATERIALS

A regulatory database review of federal and state hazardous material databases was evaluated to identify the presence of hazardous materials in the study area. The review of the environmental databases revealed the following potential hazardous material sites:

- One Large Quantity Generator (LQG)
- Three Conditionally Exempt Small Quantity Generators (CESQG)
- Two Small Quantity Generator (SQG)
- Two National Pollutant Discharge Elimination System (NPDES) permits
- No superfund, solid waste landfills, or hazardous waste treatment, storage, and disposal (TSDFs) are located within the study area.



VISUAL RESOURCES

The visual character of the study area varies from open land with rolling hills, developed residential areas, and densely located commercial, public, and educational facilities. Owned and operated by the National Park Service, efforts should be made to preserve vistas and scenic resources surrounding the Hubble Trading Post. No designated scenic roads or byways are located in the study area. In addition, the study area does not include land owned by the Bureau of Land Management, which is subject to a visual resource management system (VR) that assess the scenic value of an area and then establishes management objectives based on an acceptable level of visual preservation or disturbance.

CULTURAL RESOURCES

Cultural resources are properties that reflect the heritage of local communities, states, and nations. Properties judged to be significant and to retain sufficient integrity to convey that significance are termed “historic properties” and are afforded certain protection in accordance with state, federal, and tribal legislation. The National Historic Preservation Act (NHPA) of 1966, as amended, defines historic properties as any prehistoric or historic sites, buildings, structures, districts (including landscapes) and objects included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Traditional cultural properties having heritage value for contemporary communities (often, but not necessarily, Native American groups) also can be determined eligible for, and listed in, the NRHP because of their association with historic cultural practices or beliefs that are important in maintaining the cultural identities of such communities.

Section 106 of the NHPA requires federal agencies to consider the potential effects of their undertakings on historic properties. Effects can be direct and result in physical alteration to the property, or indirect, as when the characteristics that qualify the property for NRHP listing are altered as a result of visual, auditory, or atmospheric intrusions. To be considered eligible for listing in the NRHP, a property must retain integrity of location, design, setting, materials, workmanship, feeling, and association and must also meet at least one of the following criteria:

- Criterion A - Associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B - Associated with the lives of persons significant in our past; or
- Criterion C - Embodies the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction; or
- Criterion D - Has yielded, or may be likely to yield, information important in prehistory or history

For this study, cursory archival research was conducted at the Navajo Nation Historic Preservation Department (NNHPD). The NNHPD, which operates under the authority of the Navajo Nation Cultural Resources Protection Act (NN-CRPA), participates as the Tribal Historic Preservation Office in the federal Section 106 review process (described above) on behalf of the Navajo Nation and advises federal, state, and tribal agencies and project sponsors on protection and management of cultural resources in a manner that reflects the unique preservation concerns of the Navajo Nation. In addition to the NN-CRPA, any projects occurring on Navajo Nation lands require compliance with the following:

- Archaeological Resources Protection Act (ARPA), and
- American Indian Religious Freedom Act (AIRFA).



ARPA of 1979 (43 CRR § 6) has two fundamental purposes:

- To protect irreplaceable archaeological resources on public and Indian lands from unauthorized excavation, removal, damage, alteration, or defacement, and
- To increase communication and exchange of information among governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources and data that was obtained prior to the enactment of this Act.

ARPA regulations define an archaeological resource as “... any material remains of human life or activities which are at least 100 years of age, and which are of archaeological interest.” These qualities must be assessed to determine whether a resource merits the protection provided for under this Act.

AIRFA of 1978 (Public Law 95-341) was passed by Congress to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise their traditional religions, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites. Thus, any site or place (prehistoric or historic) having religious, ceremonial, or sacred aspects or components needs to be evaluated within the context of this law.

The NNHPD records search identified approximately 171 prior cultural resources projects and 55 previously recorded or noted cultural resources in a search area within the general vicinity of Ganado that included segments of US 191, SR 264, N15, N202, N9201, N151, and N9034. Table 4.1 lists the number of cultural resource projects identified along three of the major routes (i.e. US 191, SR 264, and IR 15) in the project area and Table 4.2 lists the previously recorded cultural resources; these sites may require further work, if construction activities occur along study roadways. NRHP eligibility recommendations for the previously recorded cultural resources are unknown at this point in the study.

Table 4.1. Number of Cultural Resources Projects by Route Segment

Route	Segment	No. of Projects ¹
US 191	Ganado Quadrangle map	41
	Ganado Mesa Quadrangle map	13
SR 264	Ganado Quadrangle map (east of US 191 intersection)	42
	Ganado Quadrangle map (west of US 191 intersection)	76
	Ganado Mesa Quadrangle map	10
	Ganado Mesa SW Quadrangle map	38
IR 15	Cornfields Quadrangle map	17

¹ Sixty-six of these projects were counted more than once because they overlapped several segments.

Source: Navajo Nation Historic Preservation Department

Table 4.2. Cultural Resources Sites

Site ID	Site ID	Site ID	Site ID	Site ID
AZ-P-13-26	AZ-P-20-24	AZ-P-13-2	NA13599	AZ-P-19-29
CASA-94-24	NA13593	AZ-K-2-3	AZ-P-20-49	19-40
AZ-P-14-7	1	AZ-P-14-1	AZ-P-20-138	AZ-K-6-24
AZ-P-14-6	2	92-11	AZ-P-20-66	Unnamed Great House 1
AZ-P-14-5	AZ-P-20-48	CSWTA-94-19	AZ-P-20-136	Unnamed Great House 2
AZ-P-14-4	Unnamed site	CSWTA-92	AZ-P-20-36	NA11356

Source: Navajo Nation Historic Preservation Department



Table 4.2. Cultural Resources Sites (Continued)

Site ID	Site ID	Site ID	Site ID	Site ID
526-1247	AZ-P-20-39	AZ-P-20-23	AZ-P-20-38	AZ-P-20-129
Unnamed cemetery	AZ-K-6-24	AZ-K-6-26	AZ-P-20-35	AZ-P-20-127
Wide Reed Ruins	AZ-K-6-29	AZ-P-20-142	AZ-P-20-27	AZ-P-20-144
AZ-P-20-9	AZ-K-5-25	AZ-P-20-143	AZ-P-20-153	AZ-P-20-141
NA13600	AZ-K-6-49	Hubbell Trading Post National Historic Site	AZ-P-20-157	AZ-P-20-129

Source: Navajo Nation Historic Preservation Department

SECTION 4(F) AND SECTION 6(F) RESOURCES

Section 4(f) of the US Department of Transportation Act of 1966 and the Section 6(f) of the Land and Water Conservation Fund (LWCF) Act are intended to protect the nation's recreational resources from significant transportation-related impacts. Section 6(f) is a component of the LWCF Act of 1965 that protects recreational properties acquired or developed with LWCF Act funds that could be affected by transportation projects. No Section 6(f) properties have been identified in the study area.

Section 4(f) stipulates that the FHWA and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless there is no feasible alternative or the projects include all possible planning to minimize harm to the property. The "use" of Section 4(f) is defined in CFR Title 23, Part 771.135(p) as:

- When property is permanently incorporated into a transportation facility;
- When there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or
- When there is a constructive use of a Section 4(f) property. A constructive use of Section 4(f) resource occurs when the proximity impacts of a proposed project adjacent or nearby a Section 4(f) property results in a substantial impairment to the property's activities or features that qualify a resource for protection under Section 4(f).

A historic site is considered a Section 4(f) property if it is eligible for the National Register of Historic Places (NRHP) under Criterion A, B, or C if the site is associated with events that have made a significant contribution to the broad patterns of our history, associated with the lives of persons significant in our past, or embodies the distinctive characteristics of a type, period, or method of construction, or that represents the work of a significant distinguishable entity whose components may lack individual distinction. Potential Section 4(f) properties within the study corridor proximity include:

- Hubble Trading Post National Historic Site (NRHP)
- Sage Memorial Hospital (NRHP)
- Ganado Unified School District Gymnasium
- Ganado Pavilion
- Rodeo Grounds



ENVIRONMENTAL JUSTICE REVIEW (TITLE VI)

Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, dictates that programs, policies, and activities identify and address, as appropriate, disproportionately high adverse human health and environmental effects on minority and low-income populations. Protected populations considered in this analysis include: minority, elderly, low-income, and disabled populations.

Environmental justice analyses have historically relied on decennial census data for identifying these protected populations; however, beginning with the 2010 Census, altered data gathering techniques eliminated the collection of income and disability status. As a supplement to the 2010 Census, the American Community Survey (ACS) samples approximately one percent of households across the country annually to determine social and economic trends. To account for the differences in Census and ACS data, Table 4.3 outlines the FHWA's Arizona Division identified data sources to use for environmental justice data collection. Figure 4.2 provides a graphical comparison of the protected populations while Table 4.4 summarizes the percentage of these protected populations in the study area, Ganado CDP, Burnside CDP, Apache County, and the State of Arizona.

Table 4.3. Environmental Justice Data Sources

Data Set	Sources
Minority	Census 2010
Population Age 65 and Older	
Female head of household (with children <18 and no husband present)	
Low-income (persons living below the poverty level)	2009-2013 American Community Survey ^a
Disabled	Census 2000 ^b

a The 2009-2013 estimates were released on December 4, 2014.

b Because disability questions were changed substantially in 2008, disability data collected prior to 2008 cannot be compared with data collected from 2008 or later. Since five years of data have not yet been able to be collected since 2008, there is no 5-year disability estimate available, which means the most recent disability information at the census tract level is from Census 2000

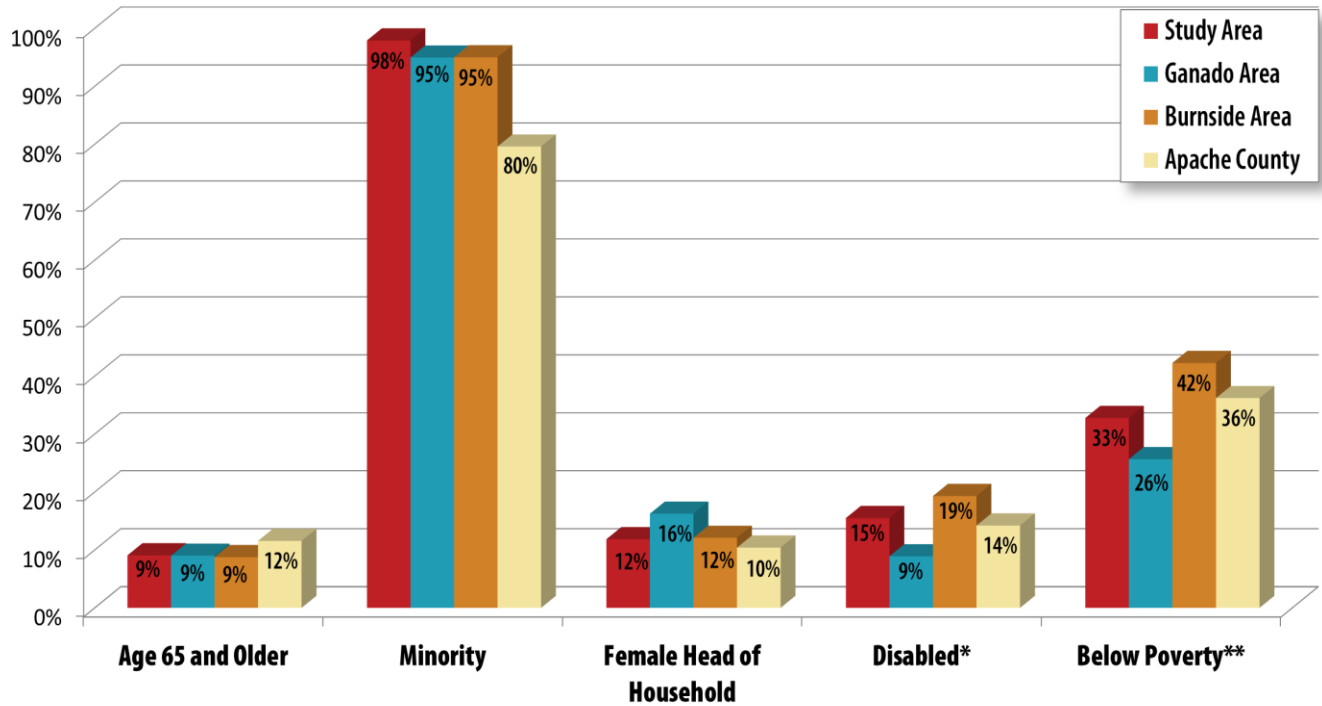
Table 4.4. Title VI and Environmental Justice Populations

Data Set	Study Area	Ganado CDP	Burnside CDP	Apache County	State of Arizona
2010 Total Population	1,854	1,210	537	71,518	6,392,017
Percent Age 65 and Older	9.1%	9.0%	8.8%	11.6%	13.8%
Percent Minority	97.9%	95.0%	95.0%	79.6%	42.2%
Percent Female Head of Household with Children Under 18 and No Husband	11.8%	16.3%	12.1%	10.4%	7.1%
Percent Disabled	15.5%	8.9%	19.3%	14.2%	19.9%
Percent Below Poverty ^{**}	32.8%	25.7%	42.3%	36.2%	16.2%

Source: 2010 U.S. Census; ^{**}2009-2013 American Community Survey (ACS); ⁺ 2000 U.S. Census



Figure 4.2. Title VI and Environmental Justice Population Groups Comparison



Source: 2010 US Census, *2000 US Census, **2009-2013 American Community Survey (ACS)

Population Age 65 and Older

Elderly populations, or persons who are over the age of 65, need to be addressed by Title VI and Executive Order 12898, Environmental Justice. Within the Ganado/Burnside study area, approximately 9.1% of the total population is over the age of 65, which is significantly less than the Apache County estimate of 11.6%. Figure 4.3 displays the age 65 and over population concentrations within the study area. As illustrated in the figure, the highest concentrations of elderly populations are located off US 191 North, N9201, N27, and near the Hubble Trading Post.

Minority Population

Minority population consists of individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black or African American, Hispanic or Latino, other race, or two or more races. Since the study area is located in the Navajo Nation, the total minority population is higher than both the state and countywide averages. According to the 2010 US Census, approximately 97.9% of the total population within the study area are cited as being a minority.



Female Head of Households

Female head of household populations consist of households headed by a female with no husband present and with children under the age of 18. These households are more likely to need affordable housing and transit access than households headed by married couples. The percent of female head of householders within the Ganado/Burnside study area (11.8%) is higher than the countywide estimate of 10.4%. Female head of household populations are primarily located northwest of the SR 264/US 191 South intersection and northwest of the R 264/US 191 North intersection.

Below Poverty Population

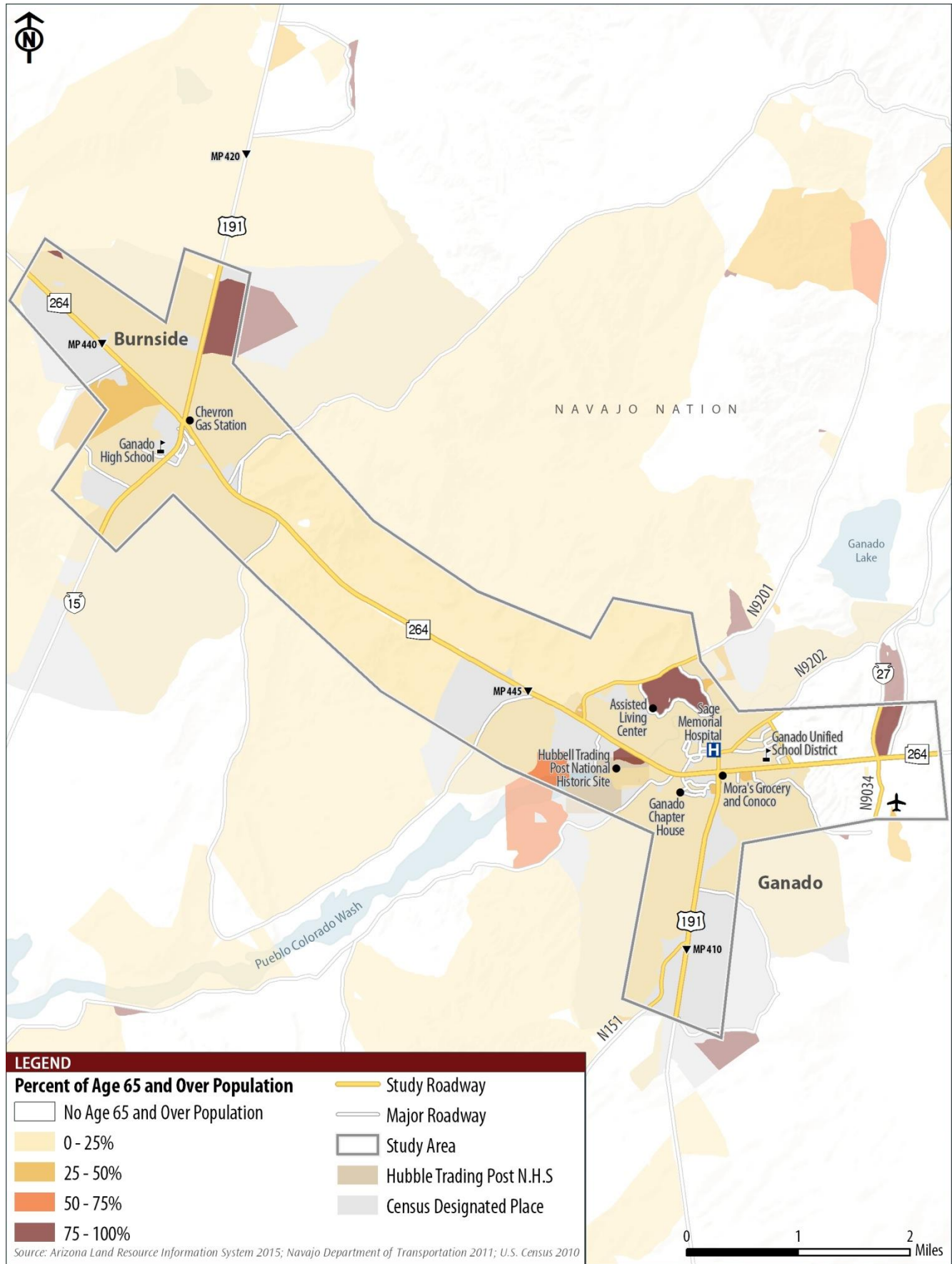
Below poverty populations are individuals living in households that lie within a set of income thresholds established by the US Census Bureau, which vary by family size and composition. Low-income households may rely on public transportation and services more than the general population; therefore, recognition of this group's concentration centers is needed to determine transportation needs. Poverty information is only available at the Census Tract and Block Group level; the Ganado/Burnside study area is located within partial sections of three Block Groups. According to the 2009–2013 ACS, approximately 32.8% of the study area's population is considered to be below the poverty level.

Disabled Population

Disabled populations are civilian, non-institutionalized persons ages 16–64 who have disabilities (such as sensory, physical, self-care, unable to go outside the home, and/or employment disabilities). This protected population group often has difficulty operating automobiles and may require access to public transportation. Disability information is only available at the Census Tract and Block Group level; the study area is located within partial sections of two Block Groups. According to the 2000 U.S. Census, 15.5 % of the total population within the study area is disabled.



Figure 4.3. Age 65 and Older Population Density



5. STUDY AREA TRANSPORTATION CONDITIONS OVERVIEW

This section inventories essential elements of the existing transportation system and documents the status/condition of each element. Major elements inventoried include roadway characteristics, crash history, and roadway performance conditions.

TRIBAL TRANSPORTATION PROGRAM (TTP)

Jointly administered by the FHWA, BIA, and US Department of Transportation, the Tribal Transportation Program (TTP), which replaces the former Indian Reservation Roads (IRR) program, addresses the transportation needs of Tribal governments by providing safe and adequate transportation and public road access to and within Indian reservations, Indian lands, and Alaska Native Village communities. Under the Moving Ahead for Progress in the 21st Century Act (P.L. 112-141), the program generally continues the IRR program, while adding a certain percentage of funds to tribal bridge and safety projects.

Under the TTP, the previous Indian Reservation Roads Inventory (IRRI) changed names to National Tribal Transportation Facility Inventory (NTTFI). The NTTFI is a comprehensive national inventory of tribal transportation facilities that are eligible for assistance under the TTP. A full listing of the current NTTFI inventory is available in Appendix B. The following sections provide an overview of information provided in the NTTFI as well as conditions identified during a comprehensive field review conducted by the study team in March 2015.

ROADWAY CHARACTERISTICS

The Ganado/Burnside study area consists of about 20 miles of paved and unpaved roadways, including:

- **SR 264:** ADOT-maintained east-west highway that serves as a local connector between Burnside and Ganado as well as a major regional corridor between Tuba City and Window Rock. As previously stated, SR 264 is currently scheduled for pavement preservation, widening the roadway to provide paved shoulders with rumble strips, installing new guardrails, and installing new signage and cattle guards as needed.
- **US 191:** ADOT-maintained north-south highway that serves as a major regional corridor that connects the study area to I-40 in the south and Chinle to the north. US 191 is also utilized to access a residential area along N151 as well as the Ganado Cemetery.
- **N15:** north-south roadway which connects SR 264 to SR 77. Within the study area, N15 serves as the main corridor to access the Ganado High School, Ganado High School employee housing, and the Navajo Housing Authority's residential development area.
- **N27:** connects SR 264 to Ganado Lake and Nazlini. N27 is heavily utilized by utility trucks as well as commuters. Roadway also provides an alternative route to Chinle.
- **N151:** unpaved local roadway that provides access to a residential area as well as to farming areas.
- **N9201:** unpaved local roadway that provides access from SR 264 to residential areas and the Ganado Assisted Living Center.
- **N9202:** unpaved local roadway that primarily serves as a local connector for residents to access N27, Ganado Unified School District, employment centers, the US Post Office, and residential areas.
- **N9034:** unpaved local roadway that provides access to the Ganado Airport.
- **County Road 420:** paved roadway that provides access for residents and students to the Ganado Unified School District.

Table 5.1 outlines the road characteristics of the major roadways located within the study area. Figure 5.3 displays the total number of lanes and the posted speed limits.



Table 5.1. Existing Study Area Roadway Characteristics

Road	Limits	Lanes	Speed Limit	Pavement Condition	Roadway Width	Functional Classification
US 191	South of SR 264	2	45 to 65 MPH	Fair to Poor	24 feet	FHWA – Rural Major Collector
	North of SR 264	2	45 to 65 MPH	Good to Fair	24 feet	FHWA – Rural Major Collector
SR 264	East of County Road 420	2 EB passing lane	40 to 65 MPH	Fair to Poor	36 feet	FHWA – Rural Minor Arterial
	County Road 420 – US 191 South	2	40 MPH	Good to Fair	24 feet	FHWA – Rural Minor Arterial
	US 191 South – MP 444	2	40 to 55 MPH	Good to Poor	24 feet	FHWA – Rural Minor Arterial
	MP 444 – MP 442.7	2 WB passing lane	55 MPH	Good to Fair	36 feet	FHWA – Rural Minor Arterial
	MP 442.6 – US 191 North	2 EB passing lane	45 to 55 MPH	Good to Poor	36 feet	FHWA – Rural Minor Arterial
	West of US 191 North	2	45 to 65 MPH	Good to Poor	24 feet	FHWA – Rural Minor Arterial
N15	South of SR 264	2	25 to 55 MPH	Good	24 to 50 feet	FHWA – Rural Major Collector BIA – Rural Minor Arterial
N27	Within Study Area	2	55 MPH	Good	30 feet	FHWA – Rural Minor Collector BIA – Rural Minor Arterial
N9201	Within Study Area	2	25 MPH	Poor	18 feet	BIA – Rural Major Collector
N9202	Within Study Area	2	25 MPH	Good	28 feet	BIA – Rural Major Collector
N 034	Within Study Area	2	25 MPH	Poor	20 feet	BIA – Rural Local Road
N151	Within Study Area	2	25 MPH	Poor	20 feet	BIA – Rural Major Collector
County Road 420	Within Study Area	2	20 to 25 MPH	Good	28 feet	N/A



Functional Classification

Functional classification is the process by which streets and highways are grouped into classes according to their role of moving traffic through a roadway network. Planners and engineers utilize this hierarchy to establish a roadway's design standards, speed, capacity, access management features, and land use development. Functional classification also impacts a roadway's eligibility for federal transportation funds for road improvements and maintenance. Roads within the Navajo Nation are classified by both FHWA and BIA functional classification system.

FHWA Functional Classification

Federal Functional Classification is assigned to all public roads using federal guidelines and is approved by FHWA. Table 5.2 provides an overview of each FHWA approved classification within rural areas. Although tribal governments primarily receive funding through BIA, in order to qualify for federal funds, roadways must be federally classified as a minor collector or above. Roadways that do not have a FHWA-approved functional classifications are deemed ineligible for federal funding. Figure 5.1 illustrates the FHWA provided functional classification within the study area. Based on FHWA-approved functional classifications, the following roadways within the study are federally classified:

- **Rural Minor Arterial:** SR 264
- **Rural Major Collector:** US 191 South of SR 264; US 191 North of SR 264, N15
- **Rural Minor Collector:** N27

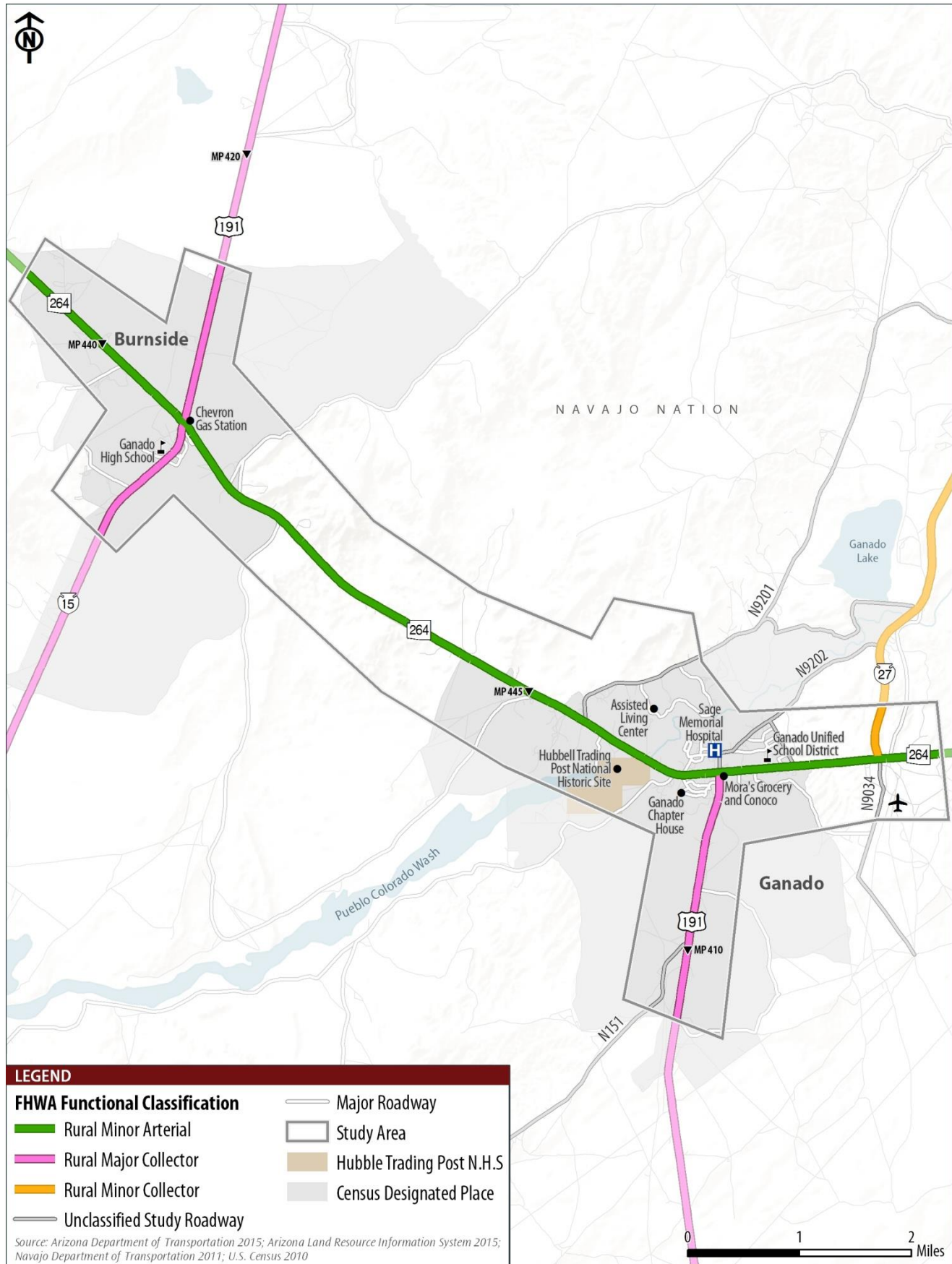
Table 5.2. FHWA Functional Classification Definition

Class	Description
Rural Minor Arterial	Link cities and larger towns (and other major destinations such as resorts capable of attracting travel over long distances) and form an integrated network providing interstate and intercounty service.
Rural Major Collector	Provide service to any county seat not on an Arterial route, to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intra-county importance such as consolidated schools, shipping points, county parks and important mining and agricultural areas. Rural Major Collectors also link these places with nearby larger towns and cities, or with Arterial routes.
Rural Minor Collector	Spaced at intervals, consistent with population density, to collect traffic from Local Roads and bring all developed areas within reasonable distance of a Collector. Provide service to smaller communities not served by a higher class facility.

Source: FHWA



Figure 5.1: FHWA Functional Classification



BIA Functional Classification

Roadway functional classification data was obtained from the existing BIA NTTFI roadway inventory. Table 5.3 provides a list of the BIA functional classification types and definitions and Figure 5.2 illustrates the BIA classified routes within the study area. BIA and the Navajo Nation owned and maintained roadways have specific guidelines for the functional classification of roadways. Based on BIA-approved functional classifications, the following roadways are classified:

- **Rural Minor Arterial:** N15, N27
- **Rural Major Collector:** N9201, N9202, N151
- **Rural Minor Collector:** N9034

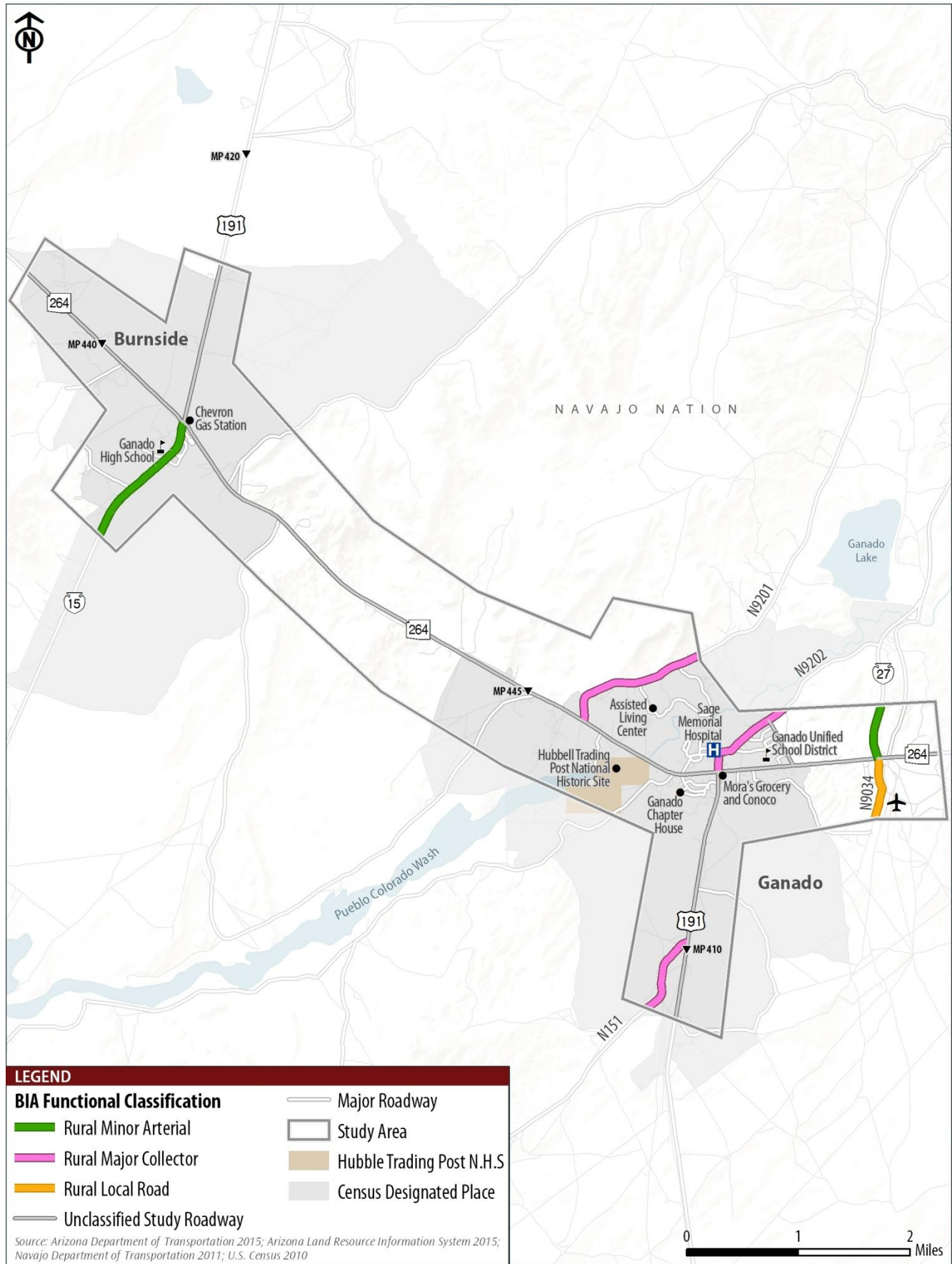
Table 5.3. BIA Functional Classification Definition

Class	Description
1	Major arterial roads providing an integrated network with characteristics for serving traffic between large population centers, generally without stub connections and having average daily traffic volumes of 10,000 vehicles per day or more with more than two lanes of traffic.
2	Rural minor arterial roads providing an integrated network having the characteristics for serving traffic between large population centers, generally without stub connections. May also link smaller towns and communities to major resort areas that attract travel over long distances and generally provide for relatively high overall travel speeds with minimum interference to through traffic movement. Generally provide for at least inter-county or inter-state service and are spaced at intervals consistent with population density. This class of road will have less than 10,000 vehicles per day.
3	Streets located within communities that serve residential areas.
4	Rural major collector road is collector to rural local roads.
5	Rural local road that is either a section line and/or stub type roads, make connections within the grid of the TTP system. This class of road may serve areas around villages, into farming areas, to schools, tourist attractions, or various small enterprises. Also included are roads and motorized trails for administration of forests, grazing, mining, oil, recreation, or other use purposes.
6	City minor arterial streets that are located within communities, and serve as access to major arterials.
7	City collector streets that are located within communities and serve as collectors to the city local streets.
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.
9	This classification encompasses other transportation facilities such as public parking facilities adjacent to TTP routes and scenic byways, rest areas, and other scenic pullouts, ferry boat terminals, and transit terminals.
10	This classification encompasses airstrips that are within the boundaries of the TTP system grid and are open to the public. These airstrips are included for inventory and maintenance purposes only.
11	This classification indicates an overlapping or previously inventoried section or sections of a route and is used to indicate that it is not to be used for accumulating needs data. This class is used for reporting and identification purposes only.

Source: Bureau of Indian Affairs



Figure 5.2: BIA Functional Classification



Number of Lanes

Based on NTTFI data and observations made during the field review, Figure 5.3 illustrates the number of lanes for major roadways in the study area. The majority of study roadways are two lanes, except for:

- **Two Lanes with Center Turn Lane**
 - N15 (Ganado High School to 0.3 mi south of SR 264)
- **Two Lanes with Passing Lane**
 - SR 264 Eastbound (MP 441.1 to MP 442.7)
 - SR 264 Westbound (MP 442.7 to MP 444)
 - SR 264 Eastbound (MP 447.7 to MP 448.7)

Posted Speed Limits

Posted speed limits on study roadway range from 25 MPH on the local roadways to 65 MPH on SR 264 and US 191. The only school zone speed reduction in the study area is on Co. 420 by Ganado Unified School District. Figure 5.3 illustrates the posted speed limits and locations of school zones within the study area. Several stakeholders cited that the actual travel speeds are much higher than the posted speed limits and that some form of enforcement is required to improve safety. As shown in the Figure, speed limits on US 191 and N27 do not reduce approaching their intersection with SR 264. Reducing the speed limit and installing community gateway signage would alert drivers they are approaching an intersection and developed areas and need to slow down. Additionally, there are no designated school zones on SR 264 at the Ganado Unified School District and on N15 at the Ganado High School.

Roadway Surface

Pavement conditions for ADOT owned facilities were obtained from the ADOT Pavement Management System. The FHWA rates pavement conditions with the International Roughness Index (IRI). This index is a statistic used to estimate the amount of roughness in a measured longitudinal profile. Based on the IRI values for the study area shown in Figure 5.4, the majority of SR 264 and US 191 roadway conditions are either good to fair condition except for the following segments:

- **SR 264:** MP 440.8 to MP 441.1; MP 445 to MP 445.05; MP 446.2 to MP 446.3 MP 448.7 to MP 448.8
- **US 191:** MP 410.6 to MP 410.7; MP 410.8 to MP 411.0; MP 411.2 to MP 411.6

It is important to note that SR 264 is scheduled for pavement preservation by ADOT; therefore improving conditions

The remaining study roadway conditions were determined through visual inspection during the field review. These roads include: N15, N27, N9201, N9202, Co. 420, N9034, N151, and N15. Roadway conditions at the time of the roadway inventory were defined as:

Good condition:

- **Paved Road:** Like new pavement with few defects as perceived by field reviewers, no signs of cracking and pavement deterioration, no maintenance are required as cracks are barely visible or well-sealed, liquid asphalt is barely noticeable.
- **Unpaved Road:** Road surface is smooth and not damaged by water, there are no depressions or upheavals and drainage is in good condition, no maintenance is required. Dust is not severe and does not obstruct visibility. Corrugations, ruts, and potholes are not deep. Wet conditions cause road to be muddy but do not cause a loss of steering.

FHWA International Roughness Index Rating Classification

Condition Term Categories	IRI Rating	
	Interstate	Other
Very Good	< 60	< 60
Good	60 – 94	60 – 94
Fair	95 – 119	95 – 170
Mediocre	120 – 170	171 – 220
Poor	> 170	> 220



Figure 5.3. Number of Lanes and Posted Speed Limits

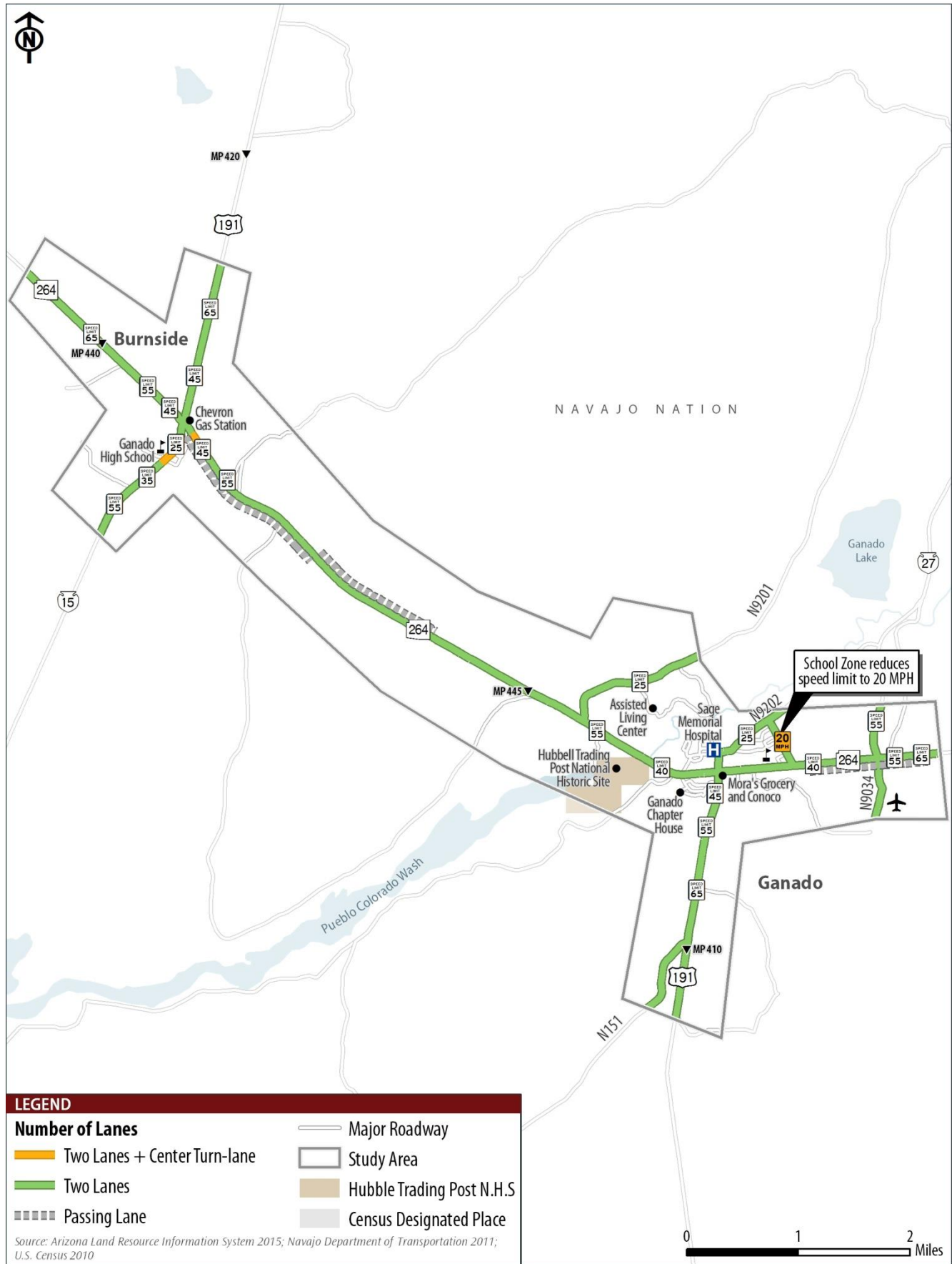
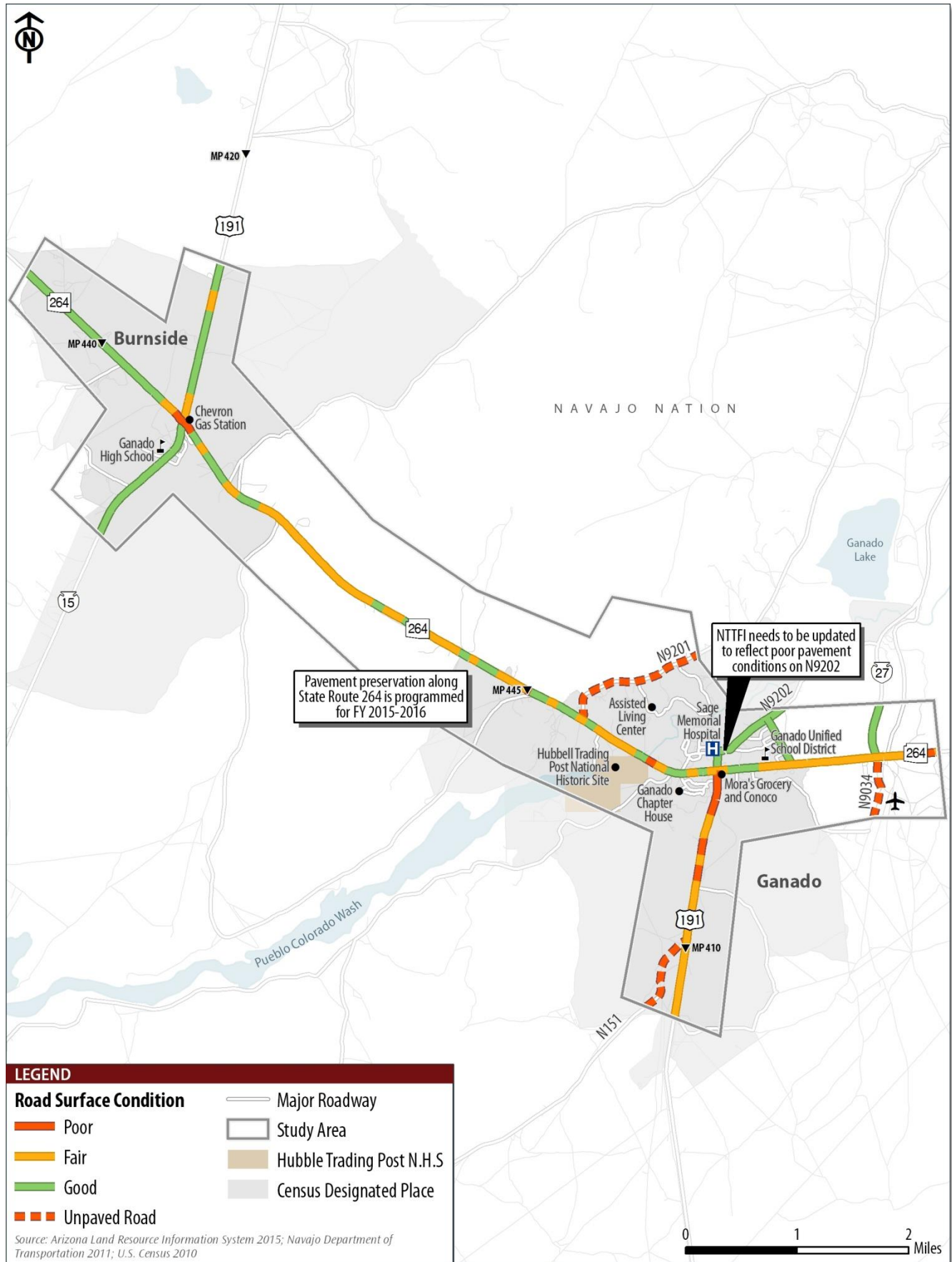


Figure 5.4. Road Surface Conditions



Fair condition:

- *Paved Road:* Slight rutting, and/or cracking, and/or roughness that became noticeable by field reviewers. Cracking in different directions is more than ¼ in wide. The road may also be bumpy from corrugations but not enough to reduce vehicle speed, and may have some pavement raveling.
- *Unpaved Road:* The surface may be bowl shaped or may have water present on the surface. Soil particles may be found on the road surface and the vehicle may experience bumps due to corrugation, ruts, and potholes. Dust produces a moderately thick cloud which partially obstructs visibility. There are drainage issues and the road becomes muddy and requires vehicle speed reduction during wet conditions.

Poor condition:

- *Paved Road:* Multiple cracks, and/or potholes, and/or roughness, and/or bleeding are apparent on roadway. Cracks in different directions are preventing easy steering of the vehicle. Roadway may be uncomfortable to vehicle occupants and drivers may need to correct or avoid road defects. Corrugated ripples cause vehicle to reduce speed and rutting prevents easy steering of the vehicle. Previous fixes on the road are deteriorated and require maintenance.
- *Unpaved:* Large amounts or evidence of water and/or severe surface depressions or upheavals. Water damage has washed away surface material leaving sharp rocks. Loose dirt creates severe dust that obstructs visibility and causes traffic to slow down or stop. Corrugations, ruts, and potholes may be large and deep and cause vehicle handling issues. Drainage is poor, and wet conditions may make the road hazardous or impassable.



Based on field review the following paved and unpaved roadways were in poor condition:

- **N15:** Paved roadway in poor condition from 0.5 mile south of SR 264 intersection to study boundary.
- **N27:** Paved roadway in fair condition
- **N151:** Unpaved roadway in poor condition
- **N9101:** Unpaved roadway in poor condition
- **N9102:** Paved roadway in poor condition from SR 264 intersection to 0.2 miles north of intersection
- **N9034:** Unpaved roadway in poor condition
- **Co. 420:** Unpaved roadway in poor condition





SR 264/US 191/ N15 Roundabout

Traffic Control

The usage of traffic control devices ensures orderly traffic flow at intersections and along roadway networks. Within the study area, there are no signalized intersections. Stop signs are the main way that the traffic is regulated, and are generally located at major intersections with SR 264 and US 191. The SR 264/US 191 North intersection is controlled by a one-lane roundabout. Stakeholders commented that from a vehicle perspective, the roundabout was an effective method of easily moving traffic through the intersection. In general, the stakeholders were in favor of the roundabout but felt it may

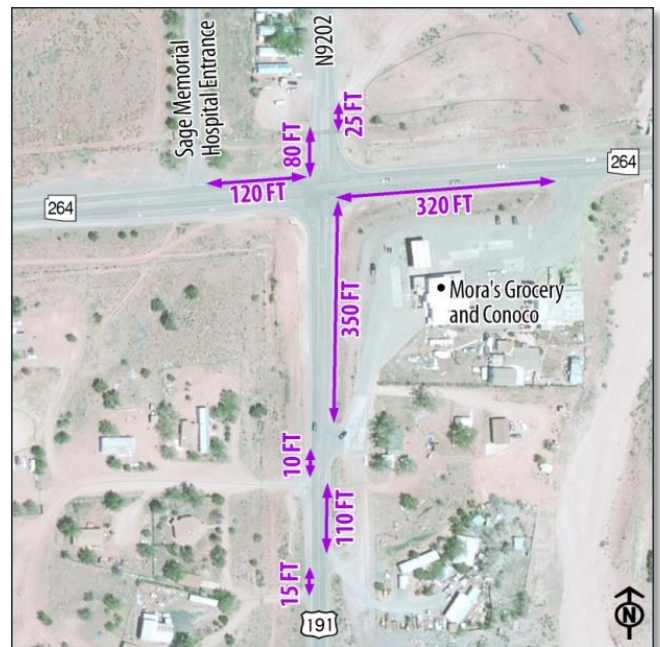
be unsafe for pedestrians and especially students walking from the Ganado High School to the Burger King and Chevron Gas Station.

Access Management

Access management is a set of techniques used to proactively manage and regulate the design, spacing, and operation of intersections, driveways, and median openings along a roadway. Roadways with more access points and intersections have more opportunities for conflicts, and significant friction to through traffic, which contributes to congestion and crashes. The objective of access management is to provide access to enhance the flow of traffic on a corridor or roadway system by improving safety, capacity, and speed. The Ganado Chapter currently does not have an access management policy in place. Access to State highways, such as SR 264, is regulated by ADOT.

Effective access management strategies control the number of driveways, decrease the number of crashes, reduce travel time and traffic congestion, preserve the flow of traffic, and improve access to properties. Primary design techniques include increasing driveway spacing, utilizing turning lanes, grade separating intersections, traffic signals, and medians. Applying access management techniques can also enhance the livability of a community, improve pedestrian/bicycle safety, enhance customer safety and convenience to businesses, provide additional areas for streetscaping, and promote efficient land and site design.

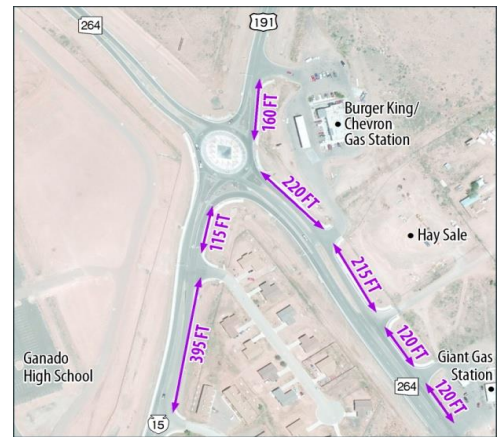
Access management guidelines for driveway spacing often range between 150 feet to over 300 feet. The Salt River Indian Community utilizes the City of Scottsdale's *Design Standards & Policies Manual* for managing access for high capacity corridors that provide commuter access to Scottsdale; minimum driveway spacing required by the City of Scottsdale includes 165 feet for minor collectors and 250 feet on minor arterials. The City of Somerton requires driveways along major arterials to have a minimum spacing of 200 feet in commercial and residential areas, while the City of Casa Grande requires a minimum driveway spacing of 200 feet on major arterials in commercial areas and 150 feet on minor arterials. Coconino County's Engineering Design and Construction Manual states that driveways are not permitted within 50 feet of a street intersection, 25 feet of a guardrail end, and within 100 feet of a bridge.



Current Driveway Spacing in Ganado



Within Ganado, driveway spacing on SR 264 and US 191 ranges between approximately 10 and 320 feet apart. The close driveway spacing increases potential conflicts, particularly coupled with limited sight distance issues at the intersections with SR 264 due to speeding vehicles. In Burnside, driveway spacing on SR 264, US 191, and N15 ranges from 115 to 395 feet, with most driveways on SR 264. Guidelines for minimum driveway or local street spacing should consider the speed of the roadway, stopping sight distance, the elimination of right-turn conflicts in the area of the access points.



Current Driveway Spacing in Burnside

Street Lighting and Pavement Striping

Street lighting fixtures are only present at the roundabout at SR 264/US 191/N15 in Burnside and at the intersection of SR 264/ US 191 South in Ganado. Stakeholders, however, have noted that the lighting near the SR 264/US 191 South intersection is insufficient for vehicles to properly see pedestrians and driveways. Lighting is also needed at the crosswalk on N15 adjacent to Ganado High School to improve motorist visibility of pedestrians.

Based on the comprehensive field review, study team members noted that pavement striping along the paved roadways was generally faded and in need of maintenance. SR 264, US 191, N15, N27, N9202, and County Road 420 are in need of pavement striping, roadside reflectors, and lighting in order to increase night visibility for motorists.

Shoulder Conditions

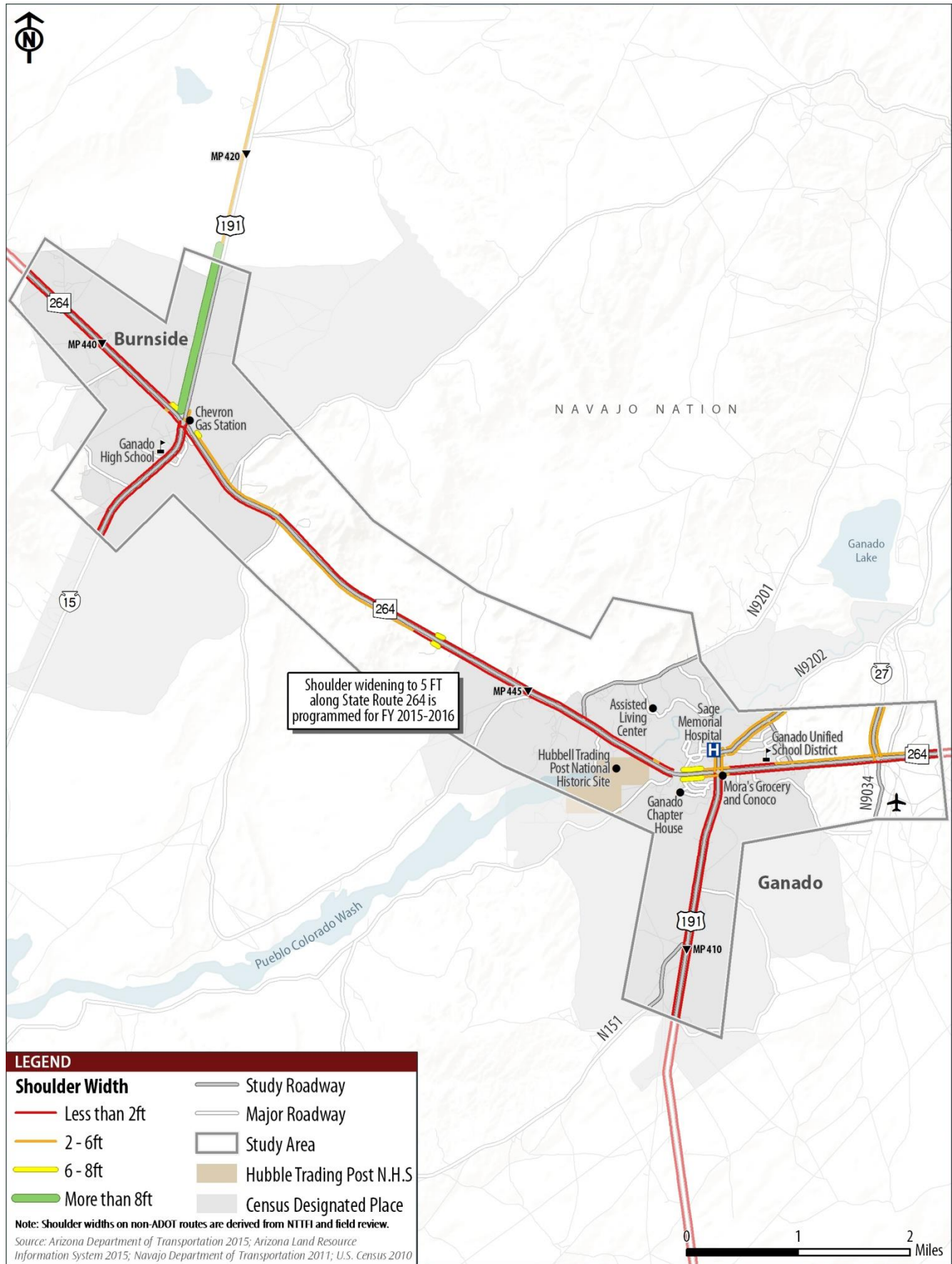
Roadside shoulders are an important safety feature that provide safe locations for disabled vehicles, allow vehicles to pull over for emergency service vehicles, and to provide bicyclists and pedestrians with a safe buffer zone from vehicular traffic. Shoulder widths for the study roadways were compiled utilizing ADOT data for SR 264 and US 191, and field review observations for the tribal roads. According to the *Arizona Statewide Bicycle Pedestrian Plan*, bike lanes should be four feet in width to safely accommodate bicyclists. Based on ADOT and the NTTFI data the majority of the study roadways have shoulder widths less than 2 FT. It is important to note, however, that ADOT is scheduled to widen shoulders along SR 264 to 5 FT.

The NTTFI also inventories shoulder conditions. Based on the latest NTTFI and field review observations, several locations within the study area have shoulders that are in critical condition and need to be reconstructed for the safety of users and the protection of traffic lanes. Stakeholders commented that due to the narrow width and poor conditions of the shoulders, pedestrians are often required to utilize travel lanes. Based on the comprehensive field review, NTTFI data, and stakeholder input, areas with shoulders in critical condition include:

- SR 264 (MP 441.0 to MP 442.7)
- SR 264 (MP 447.1 to MP 448.7)
- US 191 (MP 411.0 to MP 411.5)
- N27

Figure 5.5 illustrates shoulder conditions within the study area.

Figure 5.5. Shoulder Conditions



Fencing and Cattle Guards

Fencing and cattle guards are used as roadway safety devices to prevent livestock and wildlife from crossing roadways. Crossing livestock can impede traffic and cause crashes, more frequently on two-lane roadways since passing opportunities are limited. Due to the Nation's open grazing policies, the addition of fencing and cattle guards may prevent vehicular crashes with livestock. Based on field observations and stakeholder input the majority of properties along SR 264 are fenced; however, a large amount of fencing needs to be rehabilitated.

Stakeholders commented that maintenance is needed on cattle guards to prevent livestock from entering the right-of-way. Due to high amount of winds which are present in the region, blowing dust becomes trapped inside of cattle guards. Over time, the dust fills up the cattle guard and allows livestock to cross without much effort, shown in image to the right.

Stakeholders also commented that the cattle guards do not provide a safe means for pedestrians to cross.



Cattle guard filled with debris



Severe drainage problems on Cedar Hills Road

Drainage Conditions

In regions where rains and snow is frequent, it is important to have proper drainage on the roadways to prevent crashes and damage to infrastructure. Based on field review, NTTFI data, and stakeholder input the following roadways have drainage problems:

- N9201
- Cedar Hills Road (roadway to Ganado Chapter House)
- N151 (on roadway and intersection with US 191)
- N9034

BRIDGE CONDITIONS

ADOT bridge inventory data was accessed to determine the condition of structures along SR 264 and US 191. Within the study area, ADOT’s Bridge Inventory identifies three structures along SR 264. Table 5.4 presents the sufficiency rating for each of these structures. As listed in the table, Ganado Wash Bridge (structure #1046) has a sufficiency rating of 25.9 and is eligible for replacement. As noted in Chapter 2, the structure is scheduled for replacement in 2016. As illustrated in the figure to the right, the bridge is not wide enough to accommodate pedestrian or bicycle traffic, forcing pedestrians/bicyclists to use the travel lanes to cross the bridge.



Ganado Wash Bridge #1046

For local Navajo Routes, the NTTFI includes bridge condition information based on structure inventory and appraisal. The NTTI includes bridge condition information based on structure inventory and appraisal. According to the NTTFI, Bridge N671, located on N9202 north of the SR 264/US 191/N9202 intersection, is shown in the NTTFI to be in excellent condition with no construction required.

Table 5.4. FHWA Bridge Condition Ratings

Type	Structure #	Route	Milepost	Name	Year Built	Length (FT)	Sufficiency Rating
Culvert	6357	SR 264	444.23	SPPA	1965	13.10	80
Bridge	1046	SR 264	446.20	Ganado Wash Bridge	2004	13.41	25.9
Bridge	1435	SR 264	447.10	Ganado Pedestrian Overpass	1986	N/A	N/A

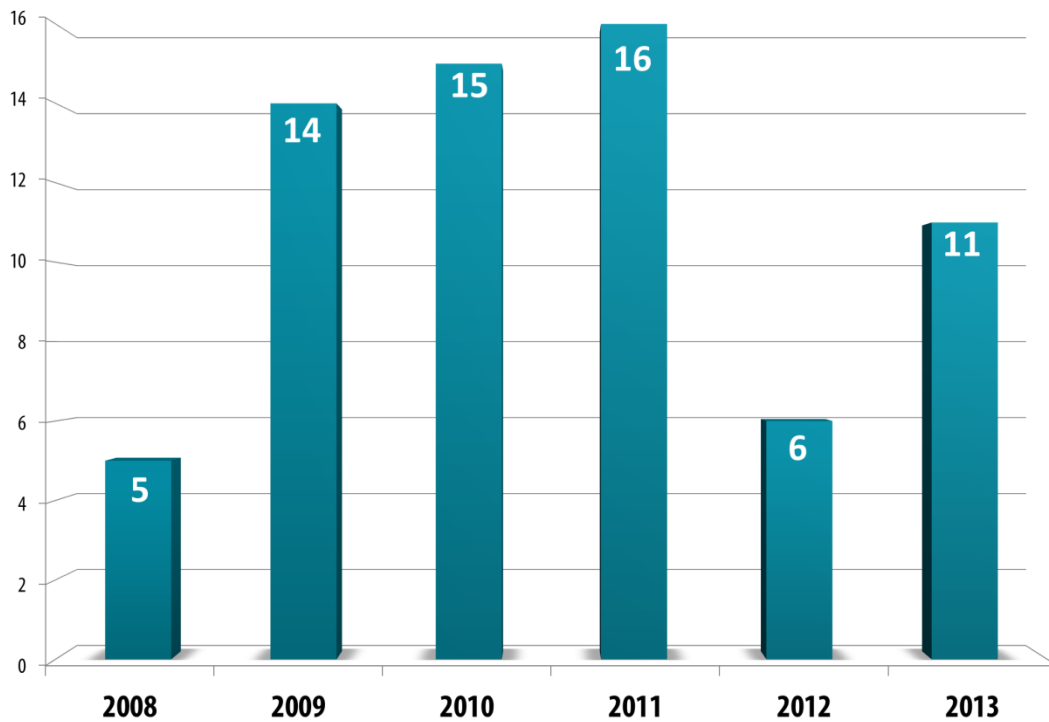
Source: ADOT Bridge Group

CRASH DATA ANALYSIS

Crash analysis was conducted for the study corridor to identify trends, patterns, predominant crash types, and high crash rate intersections and corridors. The purpose of the crash analysis is to discover safety hazard locations that need to be addressed to improve area safety.

Motor vehicle data was obtained from Navajo Department of Transportation for crashes occurring between September 2008 and September 2013. During the analyzed date range there is a total of 67 crashes occurring within the study area. The number of crashes steadily increased from 2009 to 2011, dropping in 2012 by more than 50%, and increasing again in 2013. Figure 5.6 shows the number of crashes in each analysis year. The significant drop in crashes in 2012 may be attributed to the lack of reporting.

Figure 5.6. Crash Trends from September 2008 to September 2013



Source: Navajo Department of Transportation September 2008 – September 2013



Crash Locations

Identifying crash locations and the type of crashes for each roadway corridor aids in identifying deficiencies and developing safety improvement scenarios. Table 5.5 provides a summary of the number of crashes, crash rates, and the major cause of crashes along the study roadways. As shown in the table, approximately 43% of all crashes occurred on SR 264 between Burnside and Ganado, while over 38% occurred on SR 264 within Ganado (between N9201 and the eastern study boundary).

Figure 5.7 illustrates the locations of crashes within the study area by the number of crashes occurring at each location, and Figure 5.8 presents the overall crash density as well as the locations of fatal crashes. Based on review of the each crash characteristic and location, the following trends were identified for crashes recorded between September 2008 and September 2013.

Table 5.5. Crash Locations, Crash Rate, and Leading Crash Cause

Corridor	Total Crashes	Percent of All Crashes	Fatalities	Leading Crash Causes
SR 264: Western Study Boundary to US 191 North	1	1.5%	0	<ul style="list-style-type: none"> Steering wheel malfunction causing motorist to run off road
SR 264: US 191 North to N9201	29	43.2%	0	<ul style="list-style-type: none"> 21% were intersection related 79% occurred when driver was going straight 24% were rear-end collisions caused by motorists inattention for vehicles turning off SR 264 45% occurred in westbound lane
SR 264: N9201 to US 191 South	12	17.9%	0	<ul style="list-style-type: none"> 58% were intersection related 42% occurred when driver was making left/right turn 58% occurred in eastbound lane
SR 264: US 191 South to Eastern Study Boundary	14	20.9%	2 (at N27 intersection)	<ul style="list-style-type: none"> 64% were intersection related 50% of all crashes occurred at N27 intersection 43% involved failure to yield to ROW or running a stop sign
US 191: South of SR 264	5	7.5%	0	<ul style="list-style-type: none"> 60% involved collisions with animals 60% occurred in southbound lane One pedestrian related crash
US 191: North of SR 264	2	3.0%	0	<ul style="list-style-type: none"> Motorist swerved to miss bus stopped on side of road and sideswiped on-coming traffic Motorist was passing in no passing zone and ran off road
N15: South of SR 264	2	3.0%	1 (Pedestrian related)	<ul style="list-style-type: none"> Motorist under the influence of alcohol over-turned vehicle at curve in road Motorist under the influence of alcohol hit pedestrian
N27: North of SR 264	1	1.5%	0	<ul style="list-style-type: none"> Motorist under the influence of alcohol side-swiped on-coming vehicle
Sage Hospital Road	1	1.5%	0	<ul style="list-style-type: none"> Motorist reversed vehicle at intersection rear-ending another vehicle

Source: Navajo Department of Transportation September 2008 – September 2013



Figure 5.7. Number of Crashes per Location

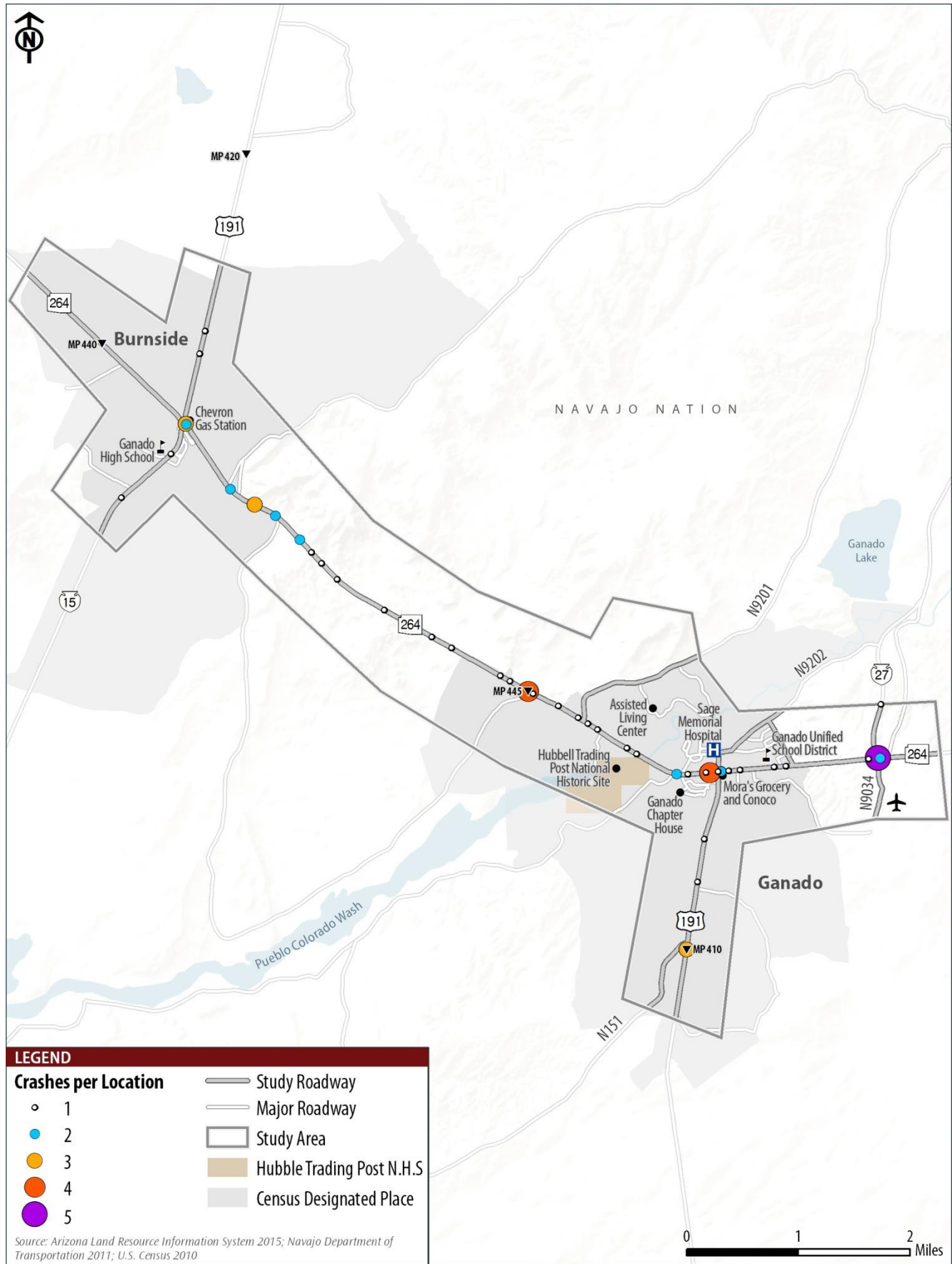
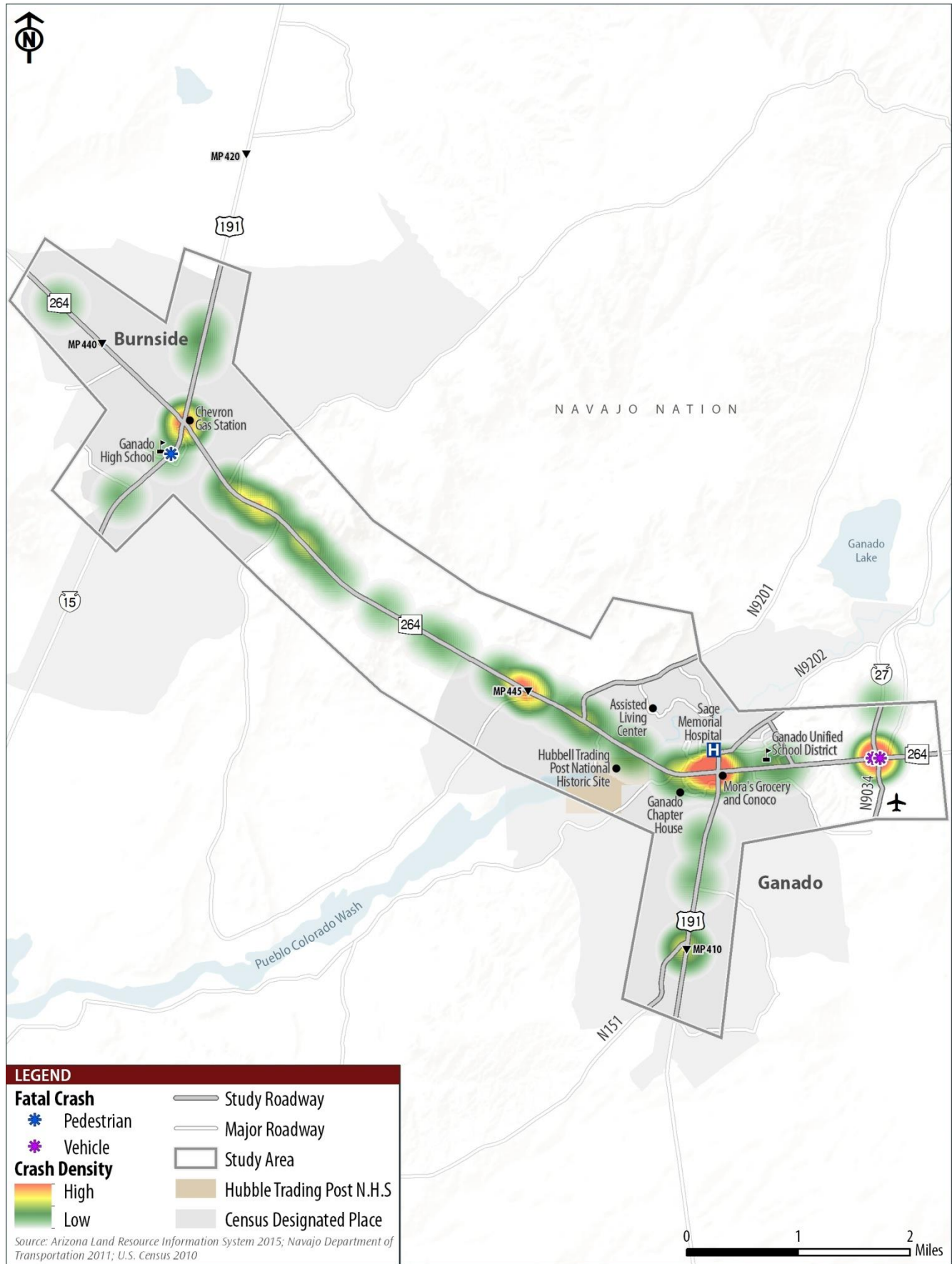


Figure 5.8. Crash Density and Fatal Crash Locations



Injury Severity

Approximately 53.7%, or 36 of 67 crashes, resulted in an injury or fatality along study roadways. Since 2008 a total of three fatal crashes occurred within the study area. Figure 5.8 provides an illustration of the location of crashes that resulted in a fatality. Two of the three fatal crashes reported occurred at the SR 247/N 27 intersection and were caused by the motorist running the stop sign or failing to yield to right-of-way.

Intersection Related Crashes

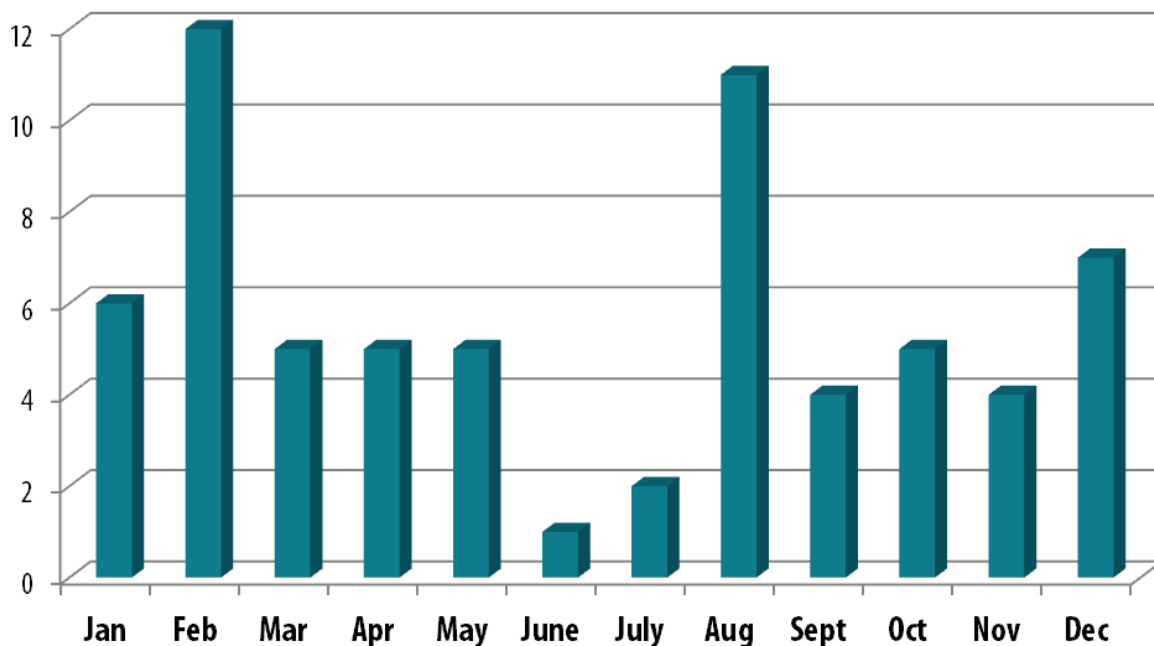
A total of 23 crashes (34% of all crashes) that occurred were identified as intersection related crashes. Intersections with a high number of crashes include:

- **SR 264/US 191 South:** 31% of all intersection related crashes occurred at this intersection. Crashes were predominately cited as “failure to yield to ROW”.
- **SR 264/N27:** 31% of all intersection related crashes occurred at this intersection. Crashes were predominately cited as “failure to yield to ROW” and “ran stop sign”.
- **SR 264/ US 191 North:** 18% of all intersection related crashes occurred at this intersection. All but one crash at the intersection occurred after the installation of the roundabout.

Road and Weather Conditions

The majority of the crashes were cited as occurring during a clear day with dry roadway conditions. 15% of all crashes were cited as occurring on wet, snow, slush, or ice covered roadways. Winter weather conditions season may be a significant factor in the high number of crashes occurring during the winter months. As shown in Figure 5.9, approximately 43% of all crashes took place between November and February. A high number of crashes also occurred in August, which may be attributed to increased tourist traffic.

Figure 5.9. Crash Trends by Month (September 2008 to September 2013)



Source: Navajo Department of Transportation September 2008 – September 2013



EXISTING TRAFFIC CONDITIONS

Traffic and turning movement counts were recorded and summarized by Navajo Department of Transportation in February 2015 as part of this study process. Daily traffic counts were collected at 13 locations along the study roadways and 5 turn movement counts for the AM/PM peak one hour periods for the critical intersections. To account for the seasonal increase of tourists to the region, seasonal factors were applied to existing traffic counts and then modeled for annual average daily traffic (AADT). This data was compared against ADOT's traffic counts for validation purposes. Figure 5.11 displays the existing daily traffic volumes. Key observations noted in the Figure include:

- SR 264 has the highest amount of traffic within the study area, particularly within Ganado.
- Traffic volumes reduce greatly on SR 264 west of the SR 264/US 191/N15 intersection.
- As a major regional corridor connecting Ganado to I-40, US 191 experiences heavy traffic volumes south of Ganado.
- N9202, linked to SR 264 and located north of Ganado Unified School District also carried a considerable amount of traffic.

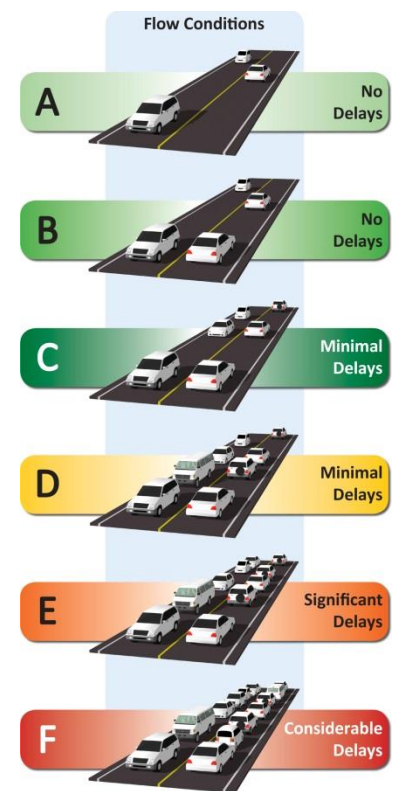
Level of Service

Traffic congestion levels of study roadways were estimated using traffic count data. The degree of traffic congestion is commonly expressed in terms of Level of Service (LOS). LOS is a measurement of traffic congestion conditions defined by the Transportation Research Board's (TRB) Highway Capacity Manual (HCM). HCM 2010 software was utilized to estimate roadway LOS and intersection LOS. In addition to the traffic counts, data such as number of lanes, functional classification, speed, and roadway geometrics were compiled to determine LOS. Each level of service is given a letter grade based on its level of congestion, ranging from "A" through "F", with LOS A representing free flowing traffic conditions where vehicles experience minimal delays and LOS F representing failure conditions where vehicles experience long delays. Figure 5.10 is an illustration of the LOS types. Road segment LOS is characterized by the HCM as follows:

- **LOS A:** Best, free flow operations (on uninterrupted flow facilities) and very low delay (on interrupted flow facilities). Freedom to select desired speeds and to maneuver within traffic is extremely high.
- **LOS B:** Flow is stable, but presence of other users is noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within traffic.
- **LOS C:** Speed is becoming affected by the presence of other users. Maneuvering within traffic requires substantial vigilance on the part of the user.
- **LOS D:** High density but stable flow. Speed and freedom to maneuver are severely restricted. The driver is experiencing a generally poor level of comfort and convenience.
- **LOS E:** Flow is at or near capacity. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within traffic is extremely difficult. Comfort and convenience levels are extremely poor.
- **LOS F:** Worse, facility has failed, or a breakdown has occurred.

In general for rural areas, LOS A and B represent no congestion, LOS C and D represent moderate congestion, and LOS E and F represent severe congestion.

Figure 5.10. Level of Service



Current Roadway Level of Service

Figure 5.11 displays the existing LOS for the study roadways. Road segments performing at a LOS B or worse include:

- **LOS B:**
 - SR 264: Western study boundary to N9201
 - US 191: North and south of SR 264
 - N15: Study area limits to SR 264
 - N9202: North of SR 264 to study area boundary
- **LOS C:**
 - SR 264: N9201 to N9202
- **LOS D:**
 - SR 264: N9202 to eastern study boundary

Current Intersection Level of Service

Utilizing the turning movement count data, LOS conditions were estimated for major intersections within the study area. Figure 5.12 displays the current lane configuration and traffic control type at each intersection and Figure 5.13 displays the turn movement volumes. Figure 5.14 displays the overall intersection LOS, and the LOS at each turn movement for each leg/approach for each intersection. Table 5.6 summarizes the intersection LOS analysis.

Table 5.6. Existing Intersection Level of Service Summary

Intersection	Level of Service	
	AM	PM
SR 264/N27/N9034	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better
US 191/N151	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better
SR 264/US 191/N9202	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS D ● All other approaches operate at LOS B or better
SR 264/N9201	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● All other approaches operate at LOS B or better
SR 264/US 191/N15	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better ● Overall intersection is LOS A 	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better ● Overall intersection is LOS A



Figure 5.11. Existing Average Daily Traffic Volumes and Level of Service

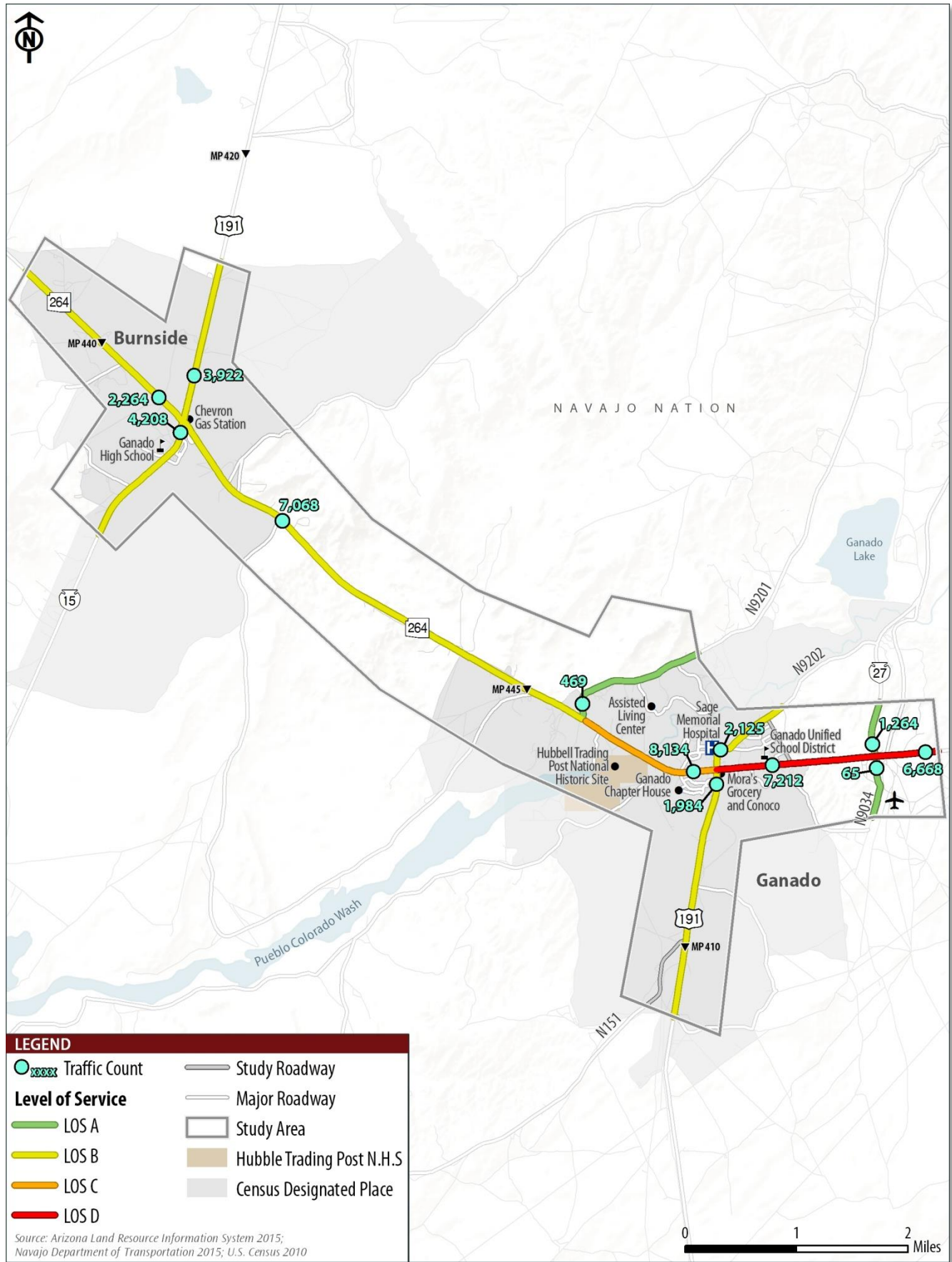


Figure 5.12. Existing Intersection Lane Configuration

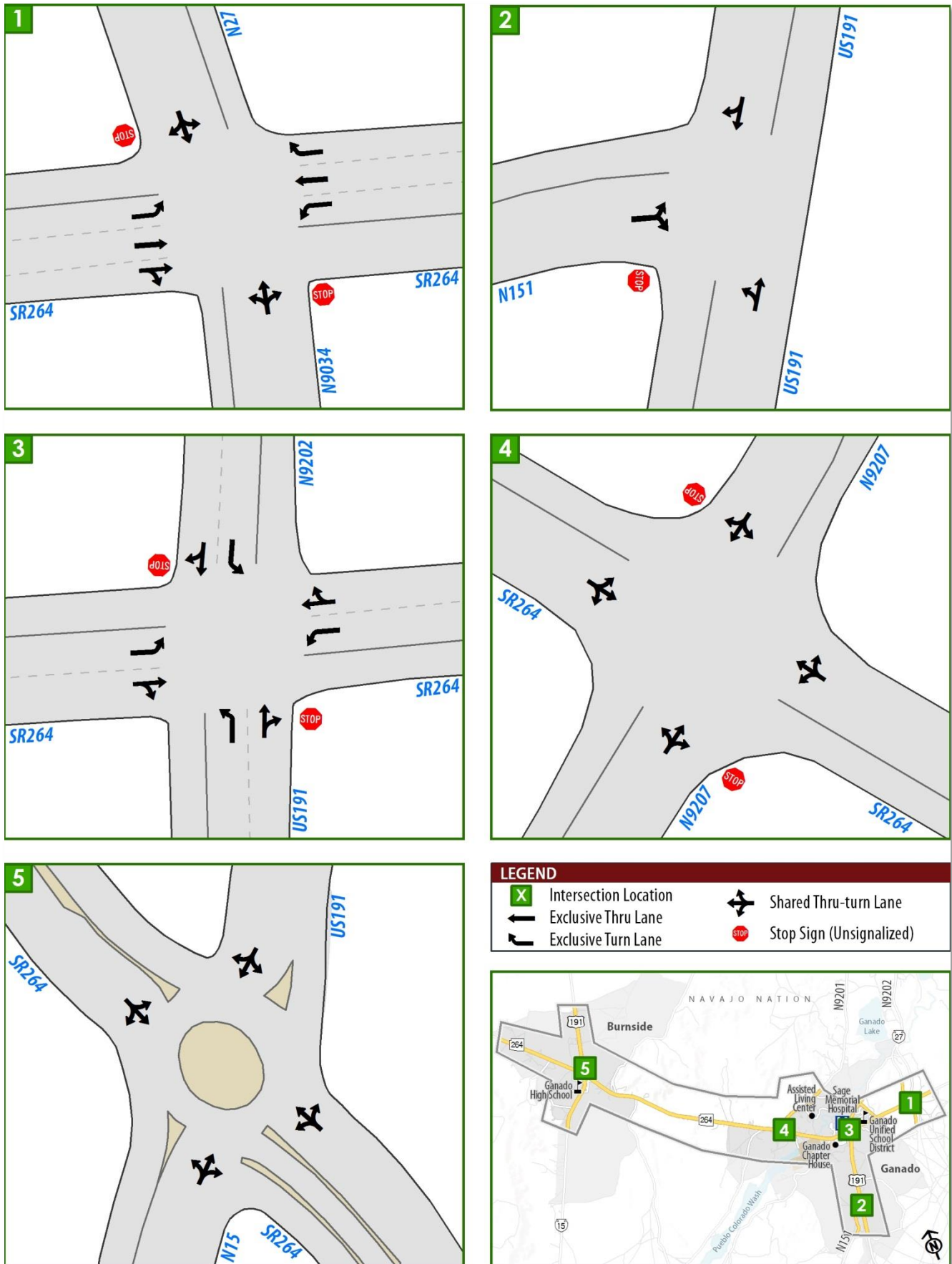
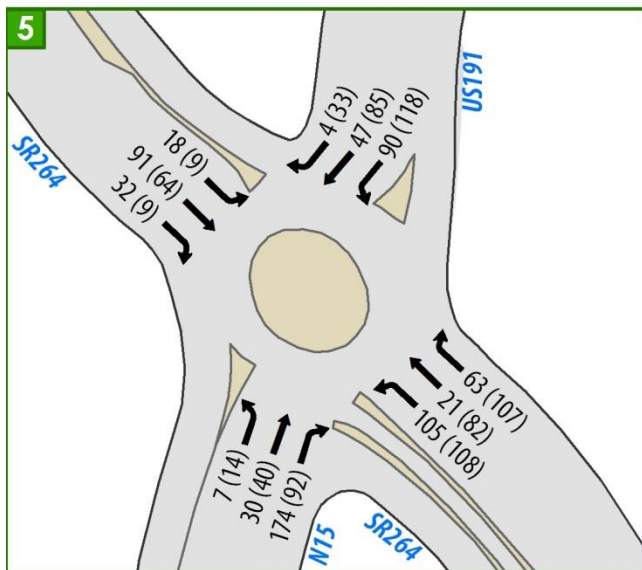
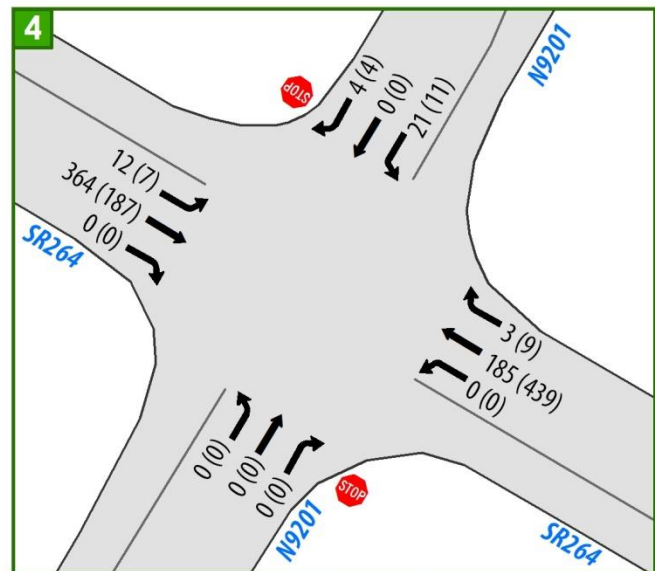
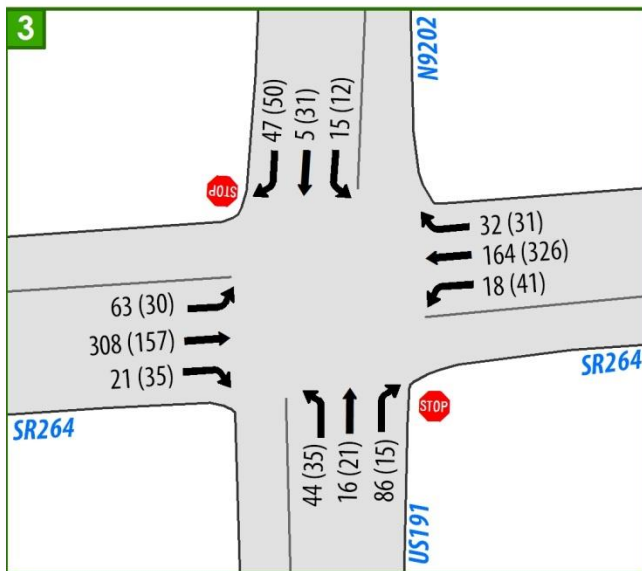
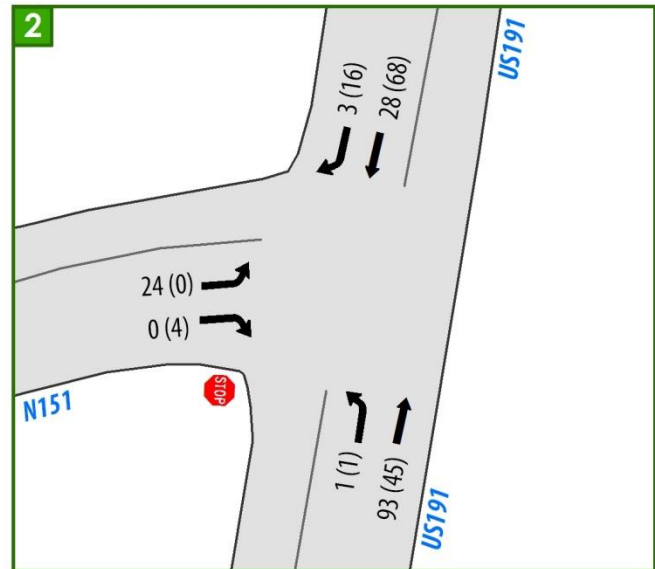
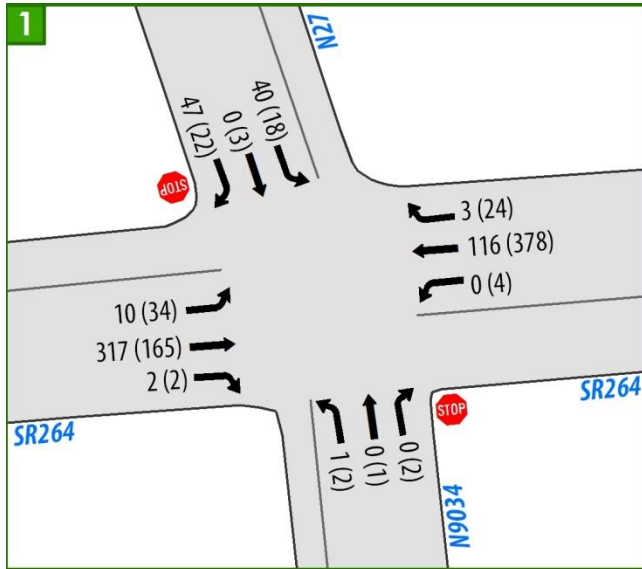


Figure 5.13. Existing Intersection Turning Movement Volumes



LEGEND

X Intersection Location

XX (XX) AM Peak (PM Peak)

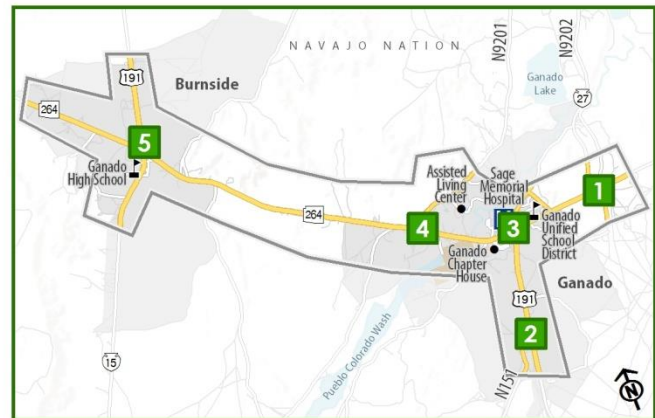
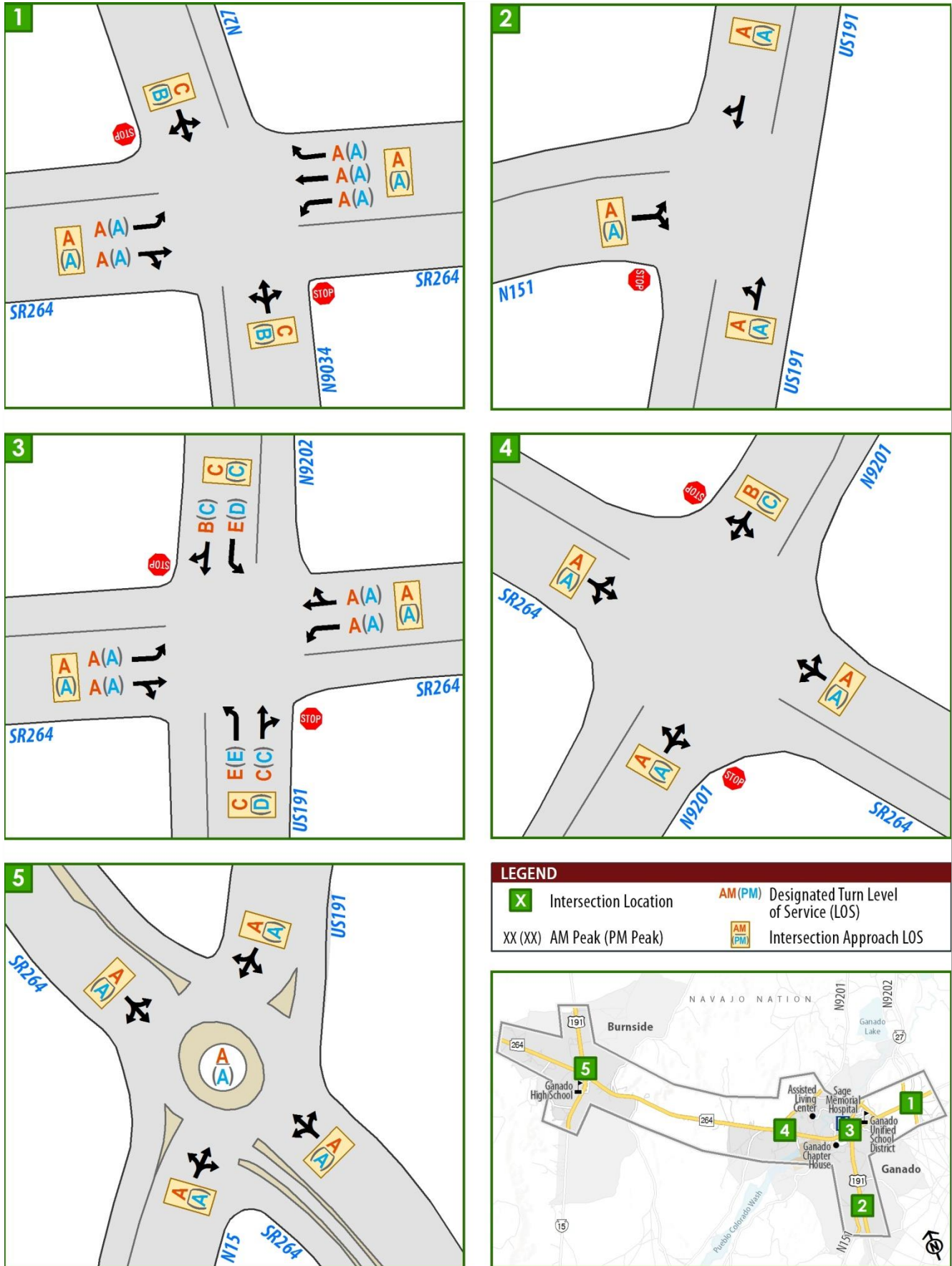


Figure 5.14. Existing Intersection Level of Service



FUTURE TRAFFIC CONDITIONS

The primary purpose of forecasting traffic volumes is to estimate the additional travel demand added to existing roadways and to forecast congestion levels due to projected growth in population and employment. In addition, this analysis provides valuable insight into potential transportation solutions. A 2% per year growth rate was utilized to forecast future traffic volumes. The future forecasts represent traffic volumes without any roadway improvements (No-Build scenario) while using future socioeconomic/growth projections. This analysis helps evaluate how roadways perform in the future if no improvements are made.

Projected 2020 Roadway Level of Service

Figure 5.15 displays the projected 2020 daily traffic volumes and the LOS for the current roadway network with projected 2020 socioeconomic/growth projections, *if no roadway improvements are made (No-Build)*. Traffic volumes and LOS results in this section represent average annual daily traffic conditions. Road segments performing at a LOS B or worse include:

- **LOS B:**
 - SR 264: Western study boundary to N15
 - US 191: North and south of SR 264
 - N15: Study area limits to SR 264
 - N9202: North of SR 264 to study area boundary
- **LOS C:**
 - SR 264: N15 to N9201
- **LOS D:**
 - SR 264: N9201 to eastern study boundary

Projected 2020 Intersection Level of Service

Based on the projected 2020 daily traffic volumes, intersection turn movement volumes were estimated using *NCHRP Report 255* methods. Figure 5.16 displays the projected 2020 turn movement volumes and Figure 5.17 displays the overall intersection LOS, and the LOS at each turn movement for each leg/approach for each intersection. Table 5.7 summarizes the intersection LOS analysis.

Table 5.7. Projected 2020 Intersection Level of Service Summary

Intersection	Level of Service	
	AM	PM
SR 264/N27/N9034	<ul style="list-style-type: none"> ● Northbound approach is LOS C ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better
US 191/N151	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better
SR 264/US 191/N9202	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS D ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS D ● Northbound approach is LOS E ● All other approaches operate at LOS B or better
SR 264/N9201	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better
SR 264/US 191/N15	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better ● Overall intersection is LOS A 	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better ● Overall intersection is LOS A



Figure 5.15. 2020 Projected Average Daily Traffic Volumes and Level of Service

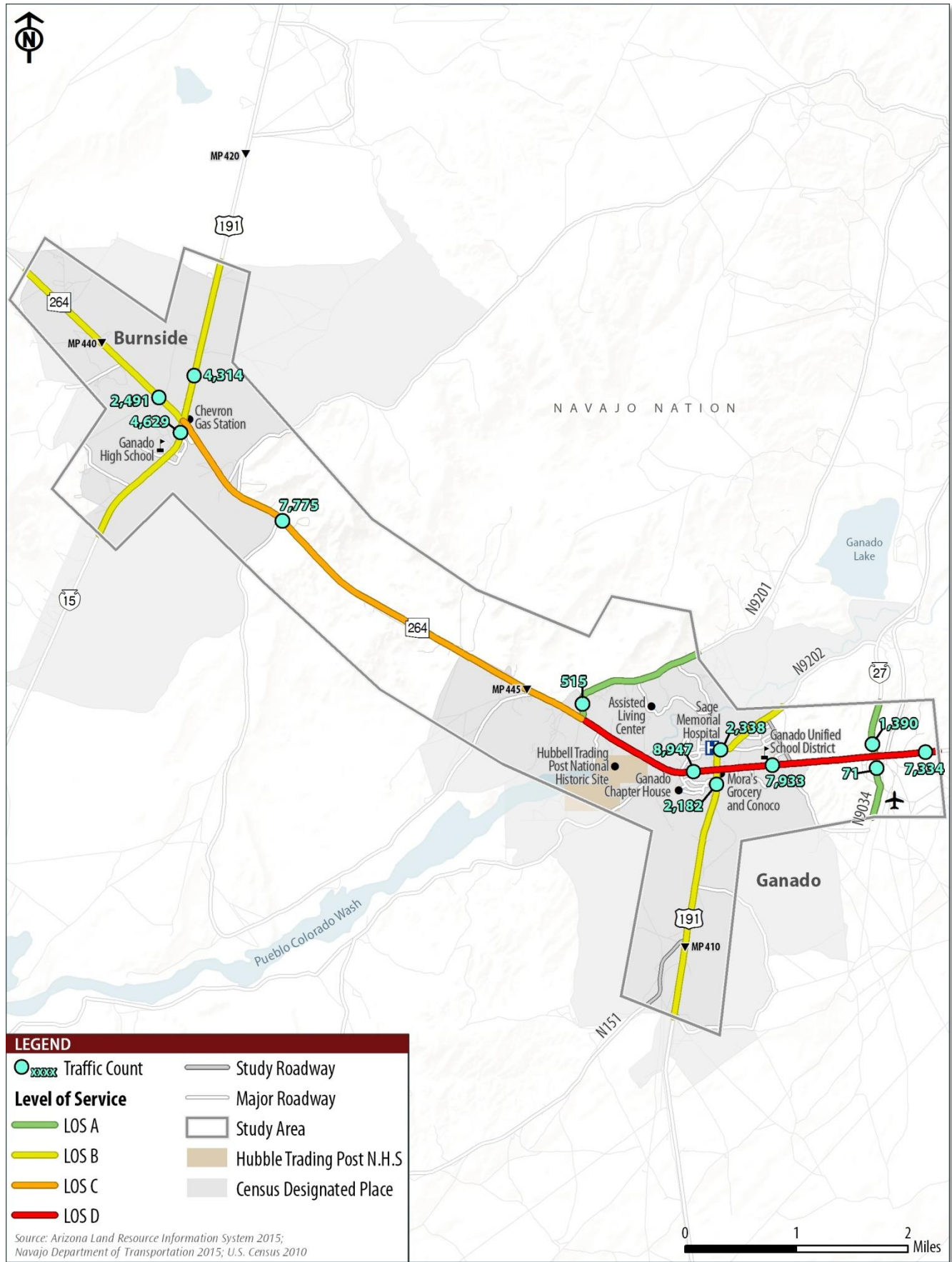
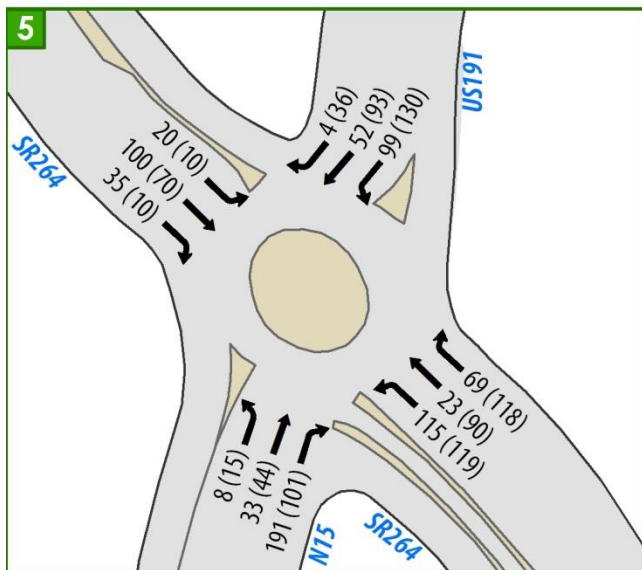
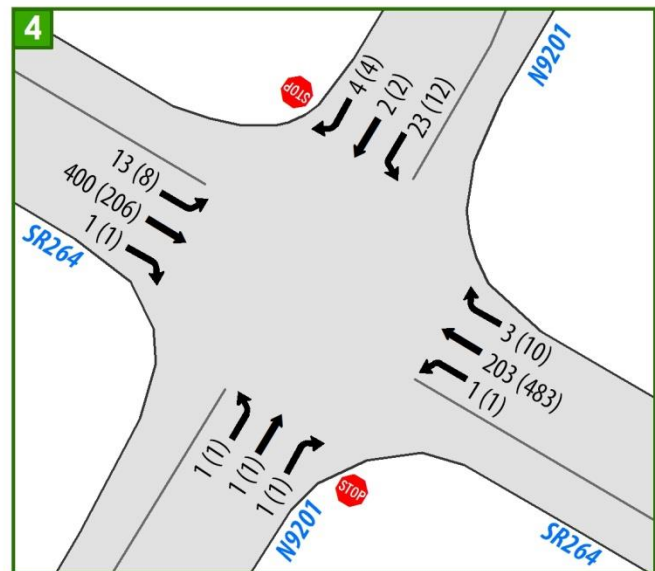
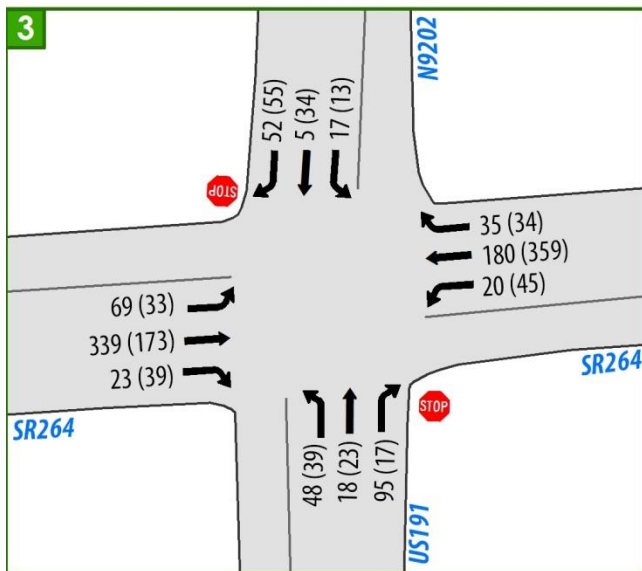
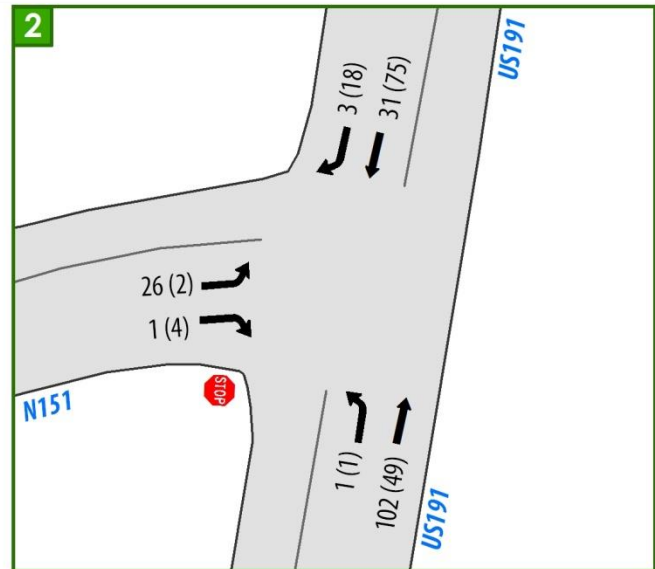
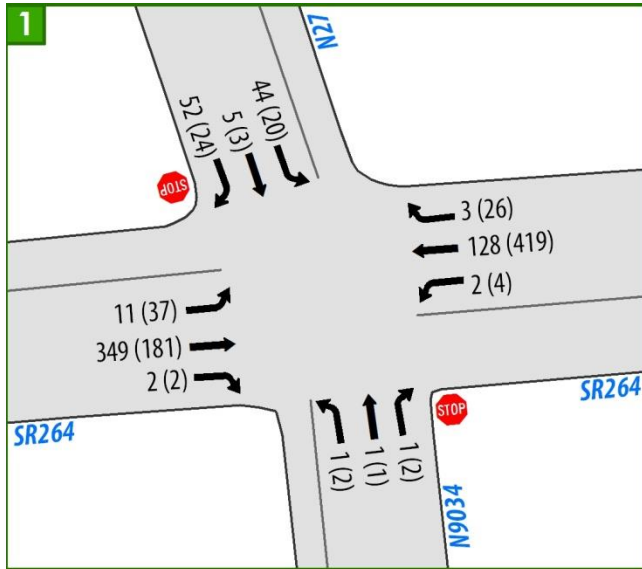


Figure 5.16. 2020 Intersection Turning Movement Volumes



LEGEND

X Intersection Location

XX (XX) AM Peak (PM Peak)

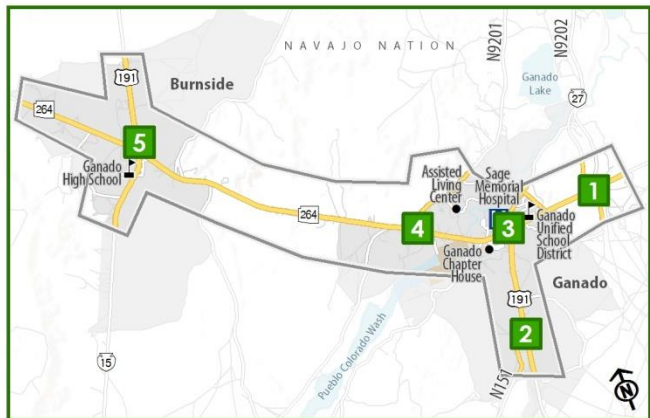
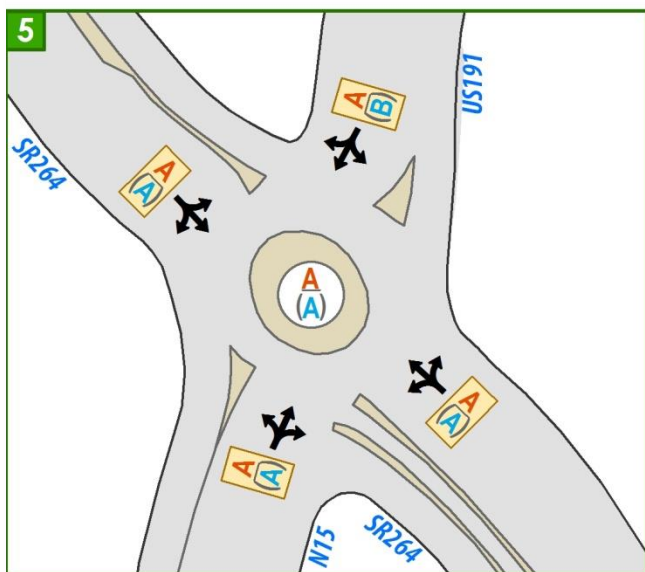
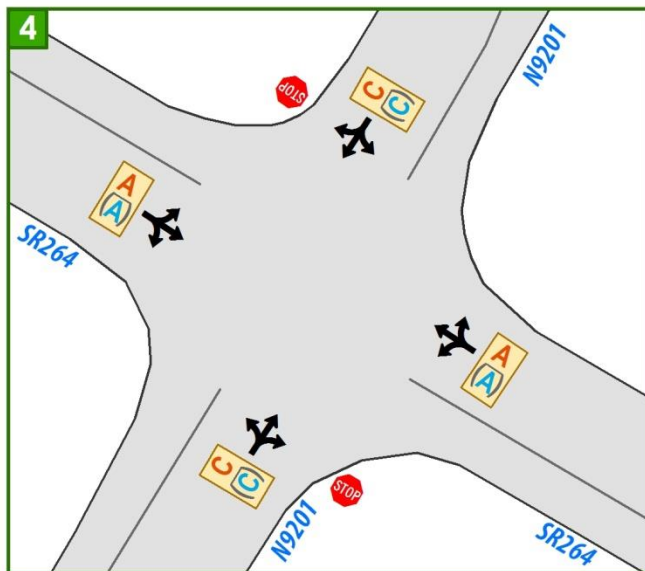
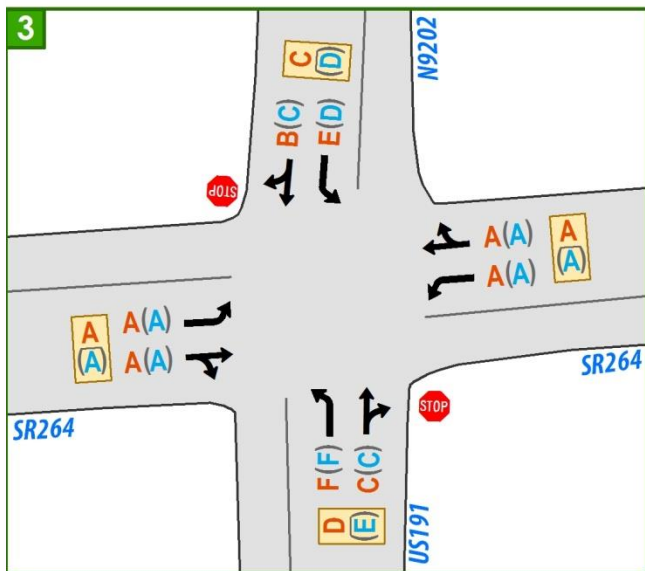
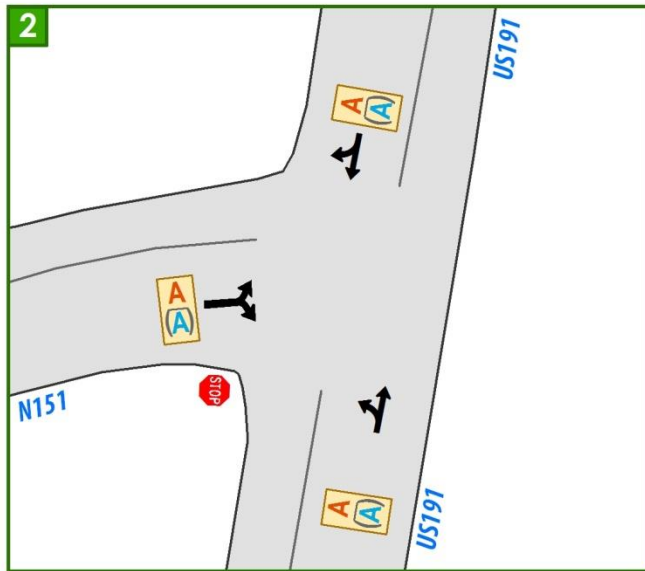
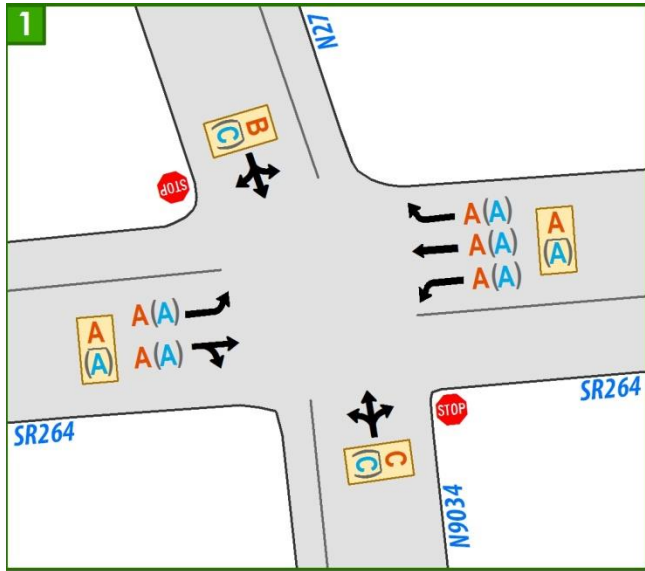
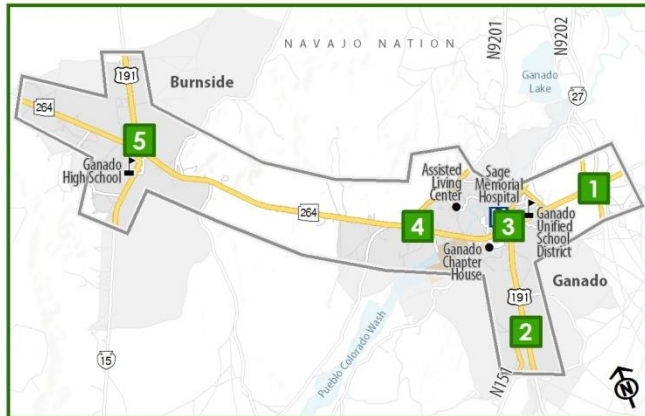


Figure 5.17. 2020 Intersection Level of Service



LEGEND

Intersection Location	Designated Turn Level of Service (LOS)
XX (XX) AM Peak (PM Peak)	Intersection Approach LOS



Projected 2025 Roadway Level of Service

Figure 5.18 displays the projected 2025 daily traffic volumes and the LOS for the current roadway network, *if no roadway improvements are made (No-Build)*. Traffic volumes and LOS results in this section represent average annual daily traffic conditions. Road segments performing at a LOS B or worse include:

- **LOS B:**
 - SR 264: Western study boundary to N15
 - US 191: South of SR 264
 - N9202: North of SR 264 to study area boundary
- **LOS C:**
 - SR 264: N 15 to N9201
 - US 191: North of SR 264
 - N15: Study area limits to SR 264
- **LOS D:**
 - SR 264: N9201 to eastern study boundary

Projected 2025 Intersection Level of Service

Based on the projected 2025 daily traffic volumes, intersection turn movement volumes were estimated using *NCHRP Report 255* methods. Figure 5.19 displays the projected 2025 turn movement volumes and Figure 5.20 displays the overall intersection LOS, and the LOS at each turn movement for each leg/approach for each intersection. Table 5.8 summarizes the intersection LOS analysis.

Table 5.8. Projected 2025 Intersection Level of Service Summary

Intersection	Level of Service	
	AM	PM
SR 264/N27/N9034	<ul style="list-style-type: none"> ● Northbound approach is LOS C ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better
US 191/N151	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better
SR 264/US 191/N9202	<ul style="list-style-type: none"> ● Southbound approach is LOS D ● Northbound approach is LOS E ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS D ● Northbound approach is LOS F ● All other approaches operate at LOS B or better
SR 264/N9201	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better
SR 264/US 191/N15	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better ● Overall intersection is LOS A 	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better ● Overall intersection is LOS A



Figure 5.18. 2025 Projected Average Daily Traffic Volumes and Level of Service

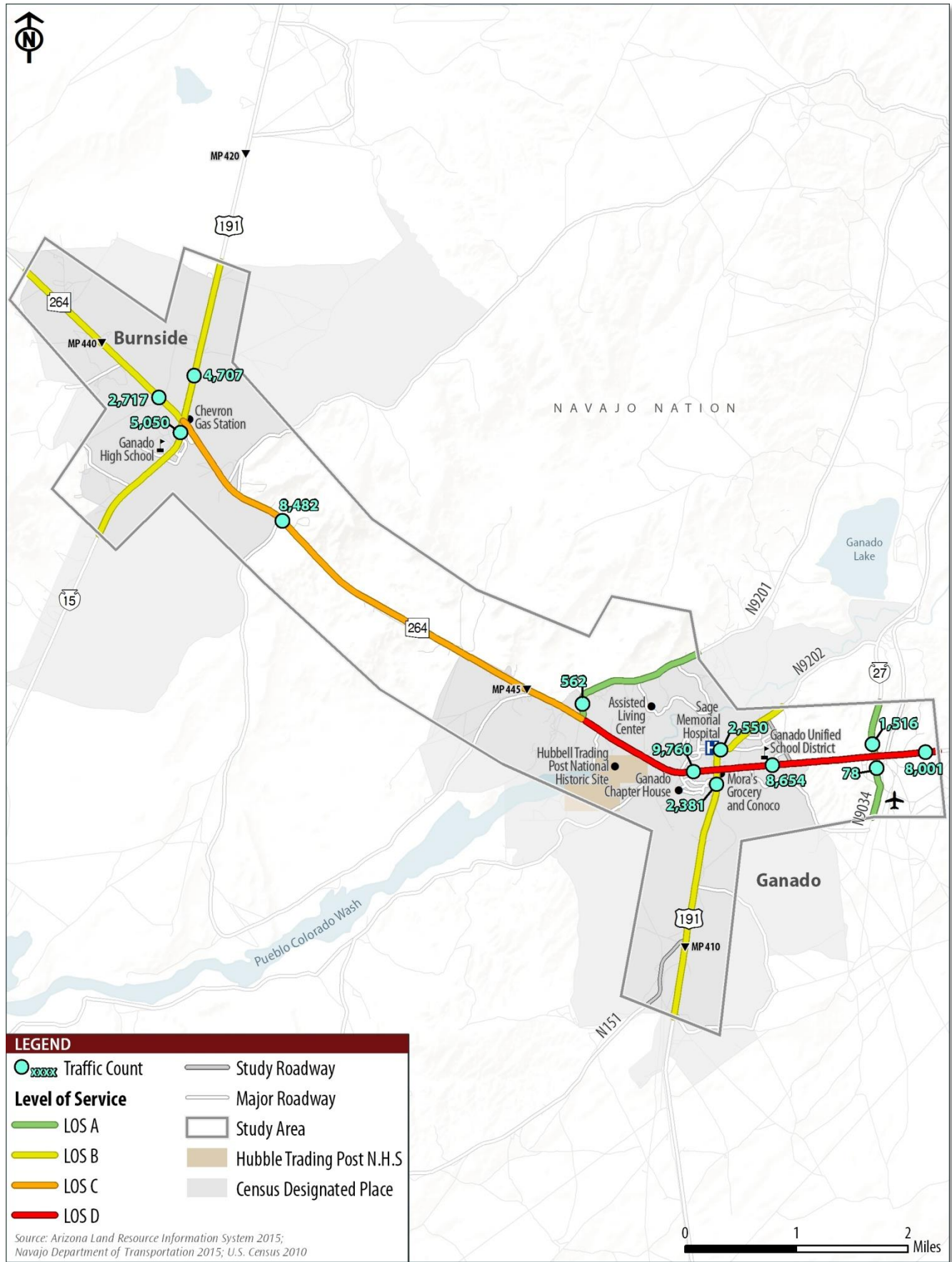


Figure 5.19. 2025 Intersection Turning Movement Volumes

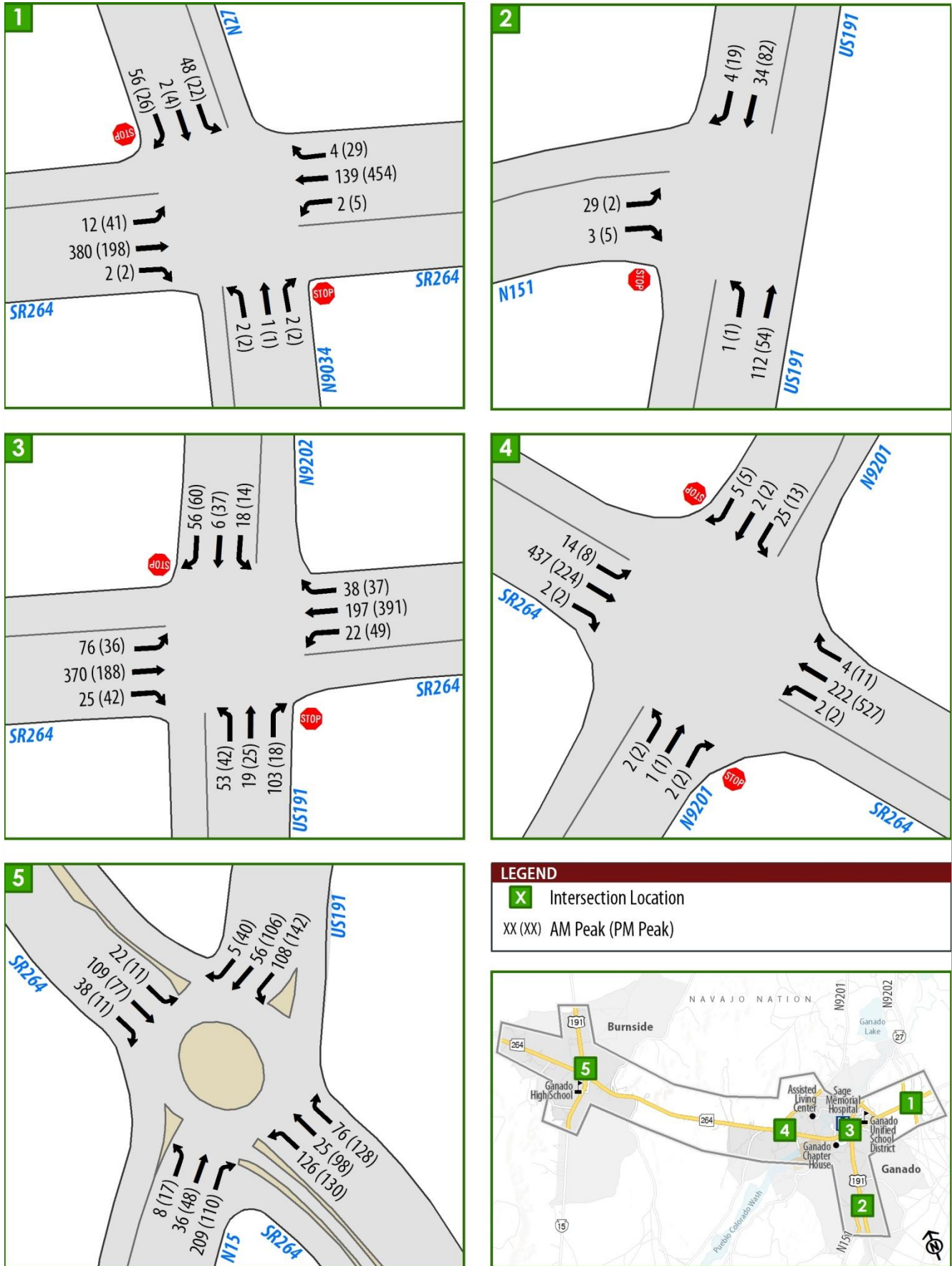
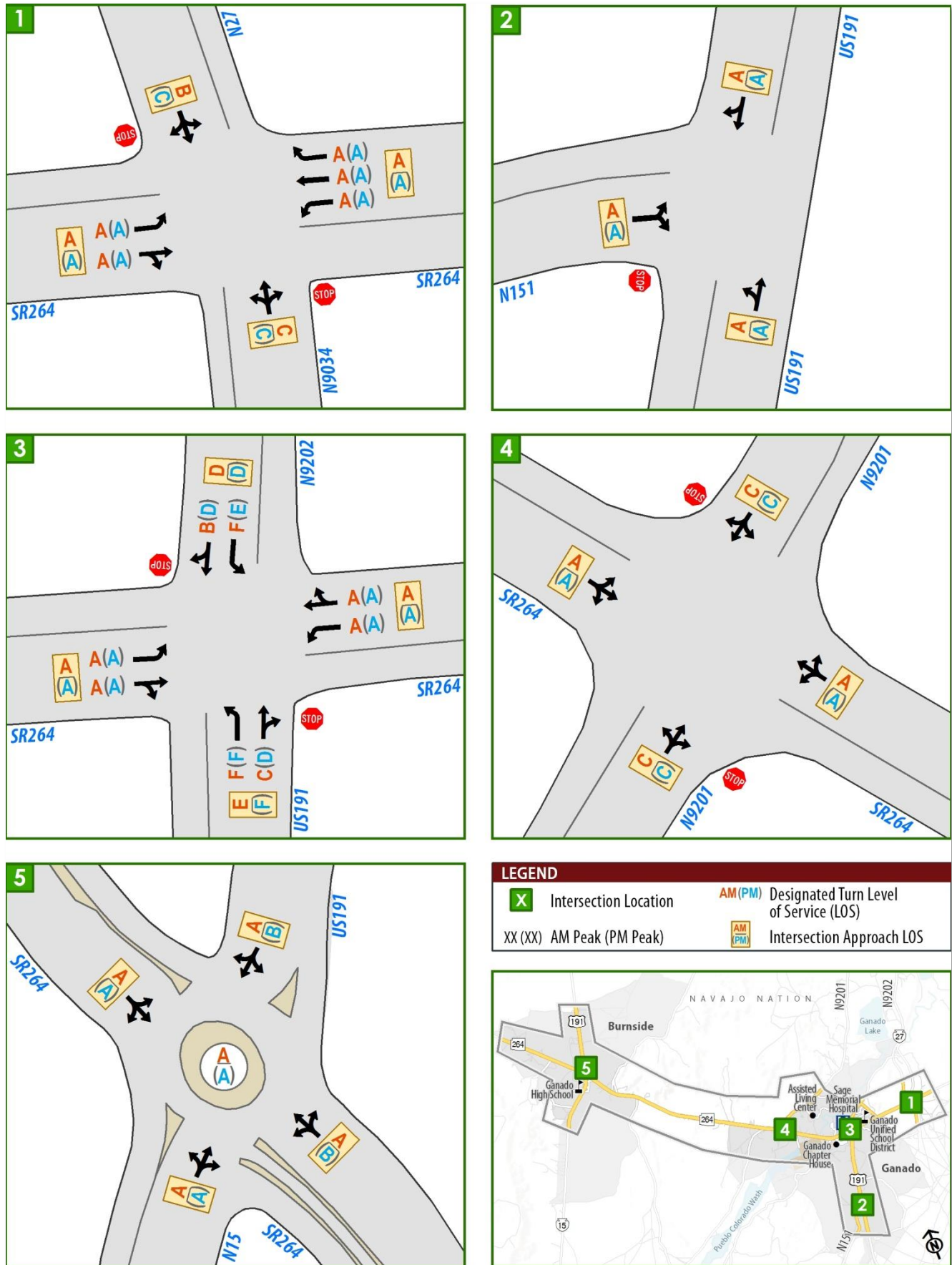


Figure 5.20. 2025 Intersection Level of Service



Projected 2035 Roadway Level of Service

Figure 5.21 displays the projected 2035 daily traffic volumes and the LOS for the current roadway network, *if no roadway improvements are made (No-Build)*. Traffic volumes and LOS results in this section represent average annual daily traffic conditions. Road segments performing at a LOS B or worse include:

- **LOS B:**
 - SR 264: Western study boundary to N15
 - US 191: South of SR 264
 - N9202: North of SR 264 to study area boundary
- **LOS C:**
 - SR 264: N15 to N9201
 - US 191: North of SR 264
 - N15: Study area limits to SR 264
- **LOS D:**
 - SR 264: N9201 to eastern study boundary

Projected 2035 Intersection Level of Service

Based on the projected 2035 daily traffic volumes, intersection turn movement volumes were estimated using *NCHRP Report 255* methods. Figure 5.22 displays the projected 2035 turn movement volumes and Figure 5.23 displays the overall intersection LOS, and the LOS at each turn movement for each leg/approach for each intersection. Table 5.9 summarizes the intersection LOS analysis.

Table 5.9. Projected 2035 Intersection Level of Service Summary

Intersection	Level of Service	
	AM	PM
SR 264/N27/N9034	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better
US 191/N151	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better
SR 264/US 191/N9202	<ul style="list-style-type: none"> ● Southbound approach is LOS F ● Northbound approach is LOS F ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS F ● Northbound approach is LOS F ● All other approaches operate at LOS B or better
SR 264/N9201	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● Northbound approach is LOS C ● All other approaches operate at LOS B or better 	<ul style="list-style-type: none"> ● Southbound approach is LOS D ● Northbound approach is LOS C ● All other approaches operate at LOS B or better
SR 264/US 191/N15	<ul style="list-style-type: none"> ● All approaches operate at LOS B or better ● Overall intersection is LOS A 	<ul style="list-style-type: none"> ● Southbound approach is LOS C ● All other approaches operate at LOS B or better ● Overall intersection is LOS B



Figure 5.21. 2035 Projected Average Daily Traffic Volumes and Level of Service

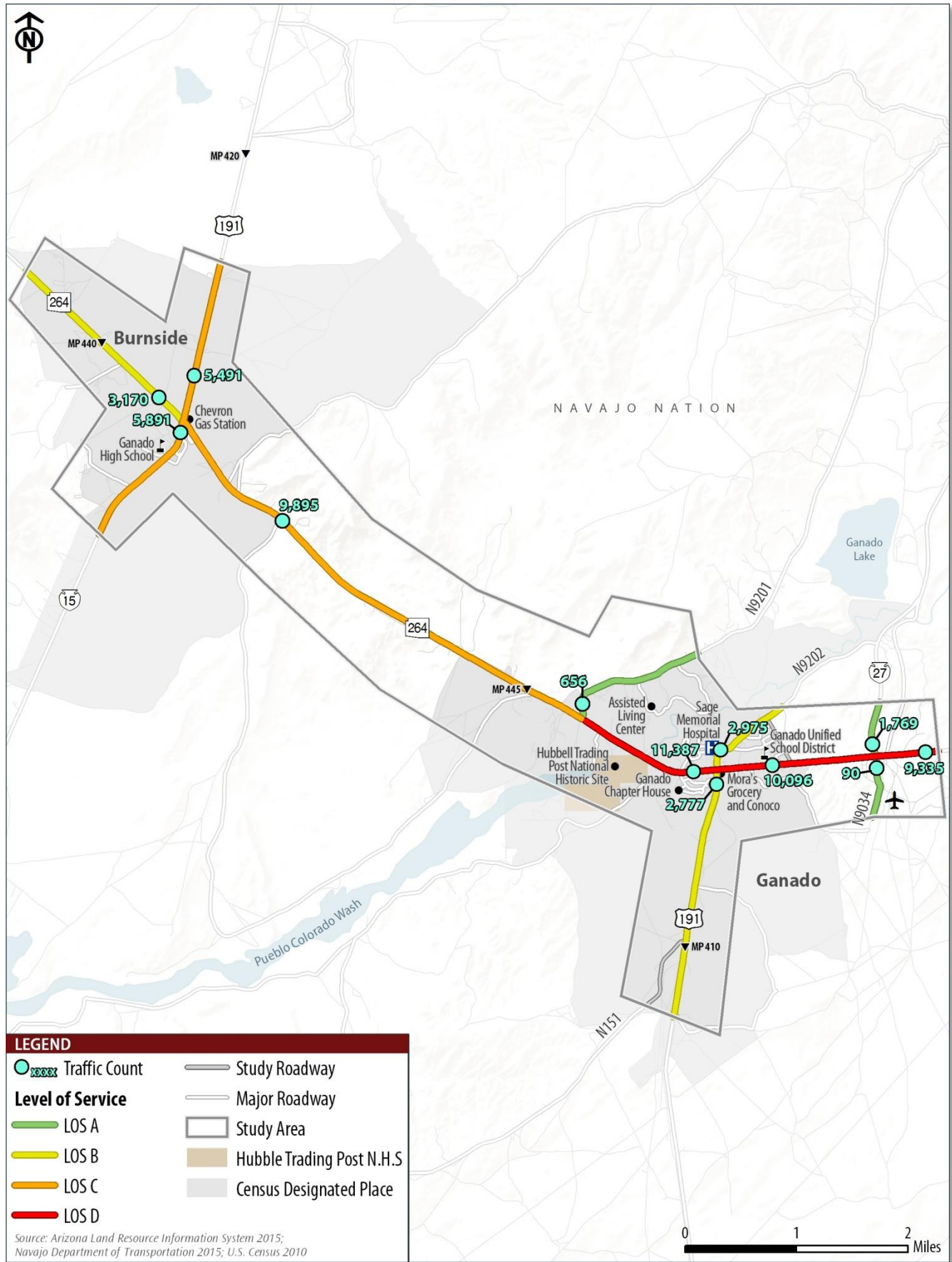
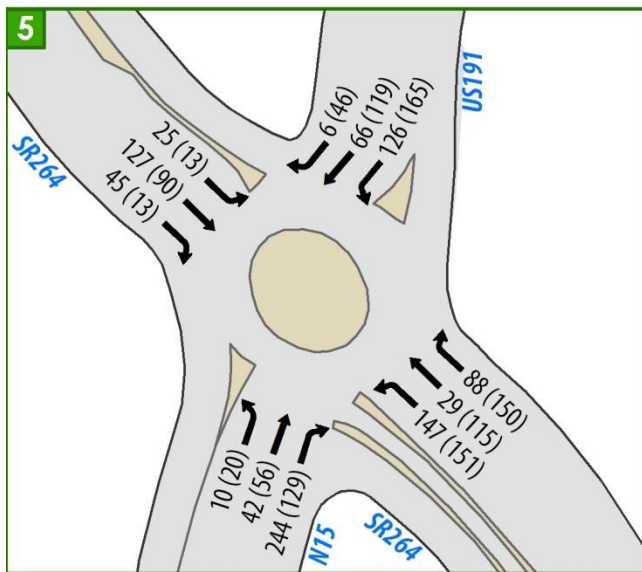
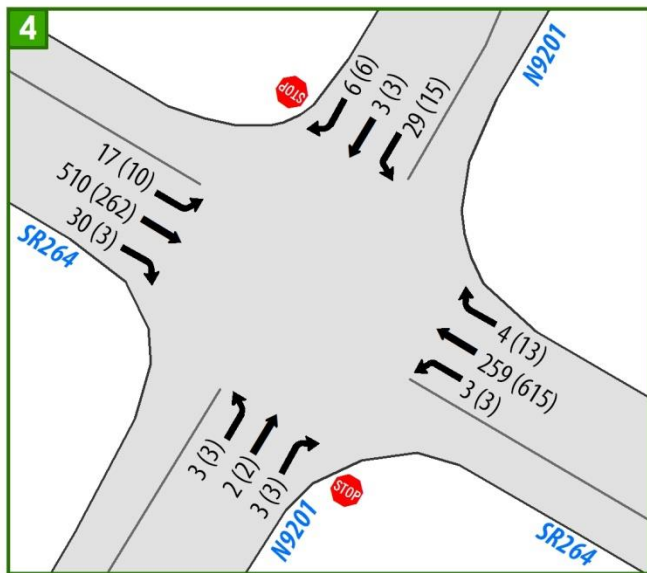
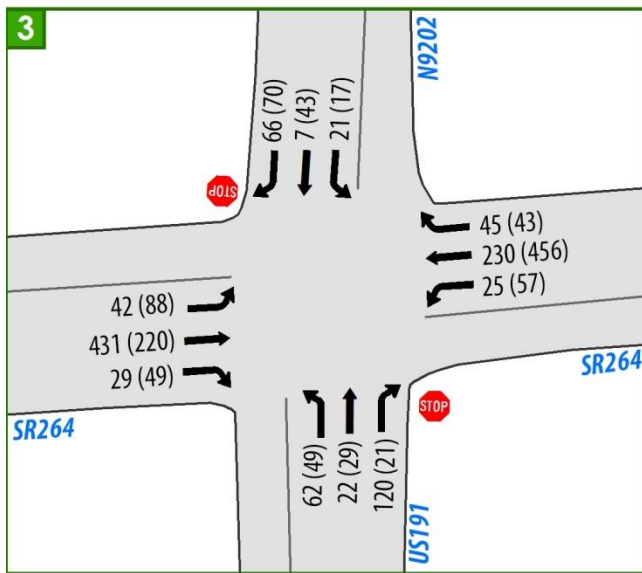
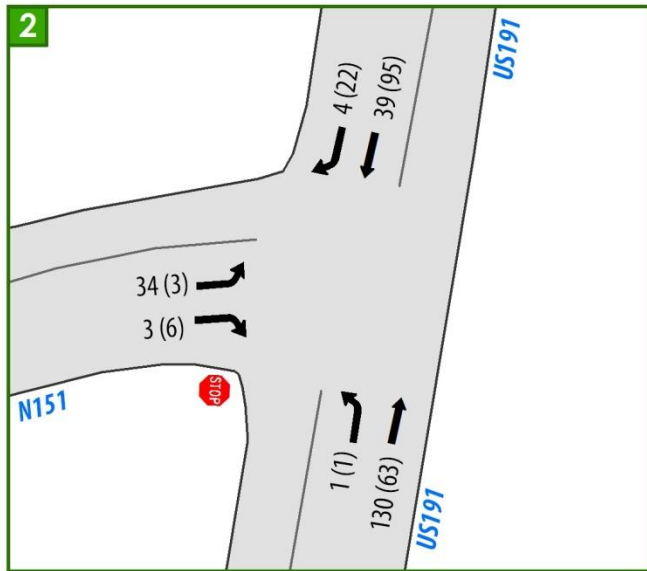
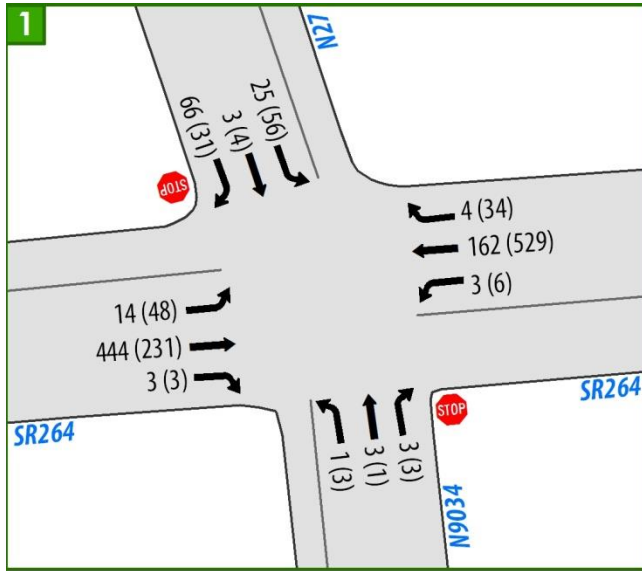


Figure 5.22. 2035 Intersection Turning Movement Volumes



LEGEND

X Intersection Location

XX (XX) AM Peak (PM Peak)

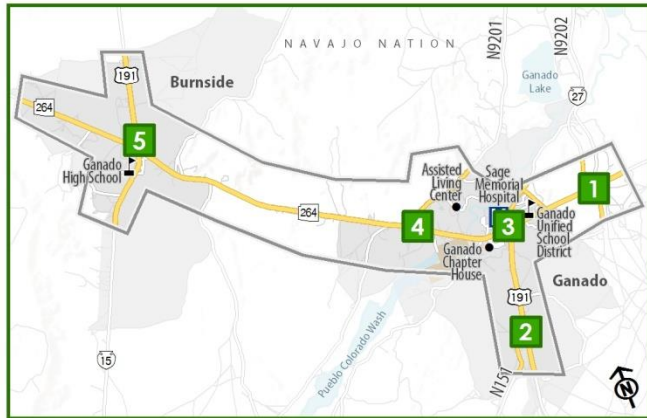
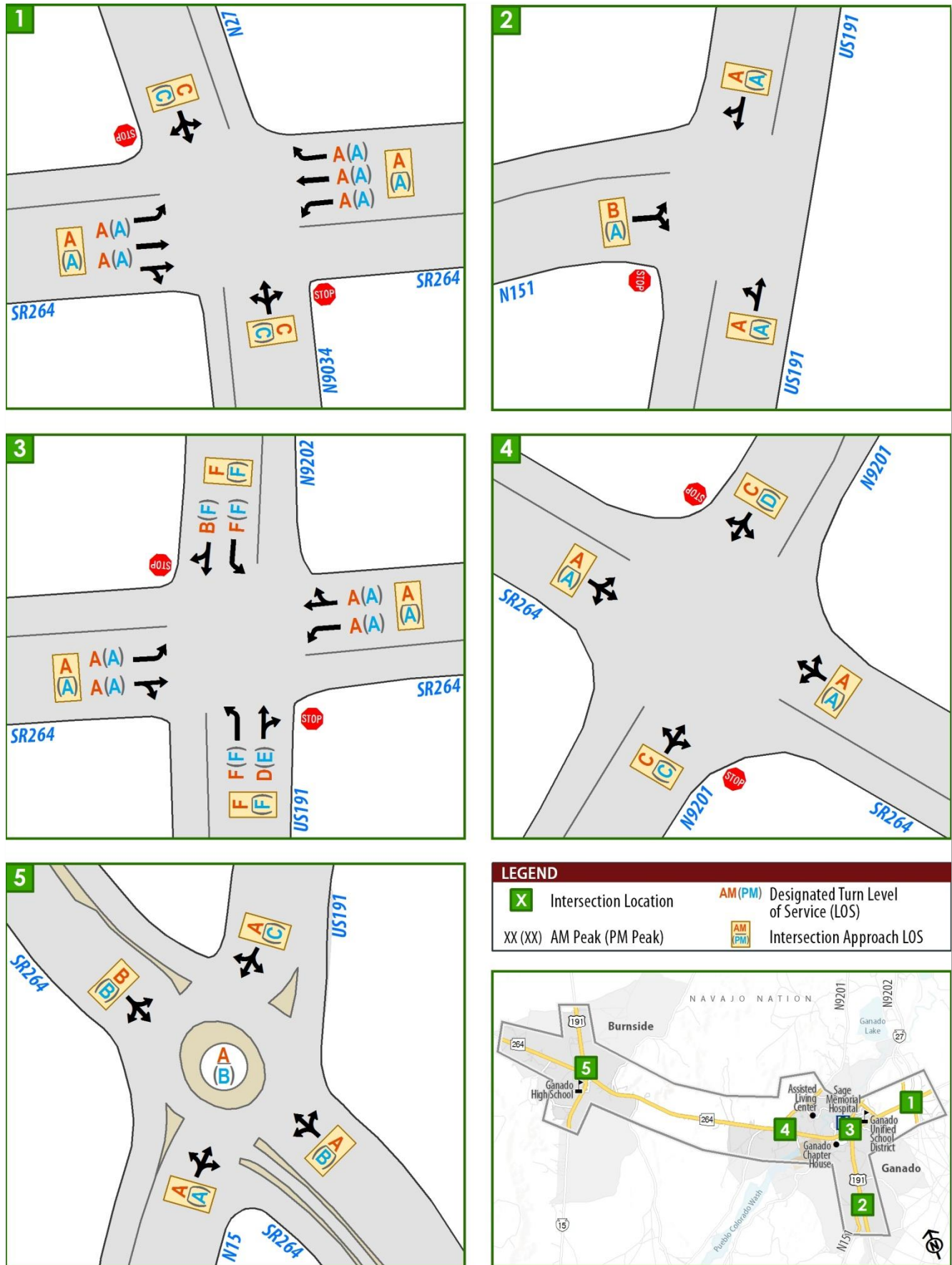


Figure 5.23. 2035 Intersection Level of Service



6. MULTIMODAL TRANSPORTATION SYSTEM CONDITIONS

Alternative modes of transportation are an important aspect of the multimodal transportation network as they provide mobility for those not able to operate without access to a vehicle and encourage physical activity. This section analyzes the existing pedestrian, bicycle, transit, and aviation facilities.

EXISTING PEDESTRIAN, BICYCLE, AND TRAIL FACILITIES

Figure 6.1 and Table 6.1 provide an overview of existing pedestrian, bicycle, and trail facilities in the study area. Sidewalks are currently only constructed along N15 near the Ganado High School, adjacent to the SR 264/US 191/N15 intersection, and in the residential area near the Ganado Chapter House. Key findings found during the field review and from input from stakeholders and TAC members include:

- Sidewalk conditions range from good to poor condition, and most have overgrown vegetation that needs to be cut back. Older sidewalks located near the Ganado Chapter House are in poor condition and are not ADA compliant.
- Sidewalks and crosswalks are not available along SR 264 and US 191 or at the intersection of SR 264/US 191.
- A pedestrian overpass is available near the Ganado Unified School District; however, stakeholders commented that students prefer crossing SR 264 at-grade and the overpass is rarely utilized.
- The SR 264/US 191/N15 roundabout incorporates pedestrian crosswalks and sidewalks; however, students walking to/from Ganado High School rarely utilize designated crossing locations. During the field review it was noted that students cross the intersection at various locations creating potential motorist-pedestrian conflicts.
- Due to the lack of sidewalks, pedestrian utilize roadway shoulders for exercise and to access activity centers and residential areas.
- Stakeholders commented that running is a culturally important activity for community members; however, there are no running trails available. To access residential areas and activity centers, several man-made paths have naturally been formed due to frequent use by residents.
- Stakeholders commented that designated trail facilities within Ganado connecting major activity centers, such as the Hubble Trading Post, Assisted Living Center, and the Friday Flea Market would be beneficial for an economic development perspective and would encourage increased physical activity among residents.
- Currently there are no bicycle lanes and shoulder widths are too narrow for bicyclists to utilize.



Figure 6.1. Existing Pedestrian Facilities in Burnside and Ganado

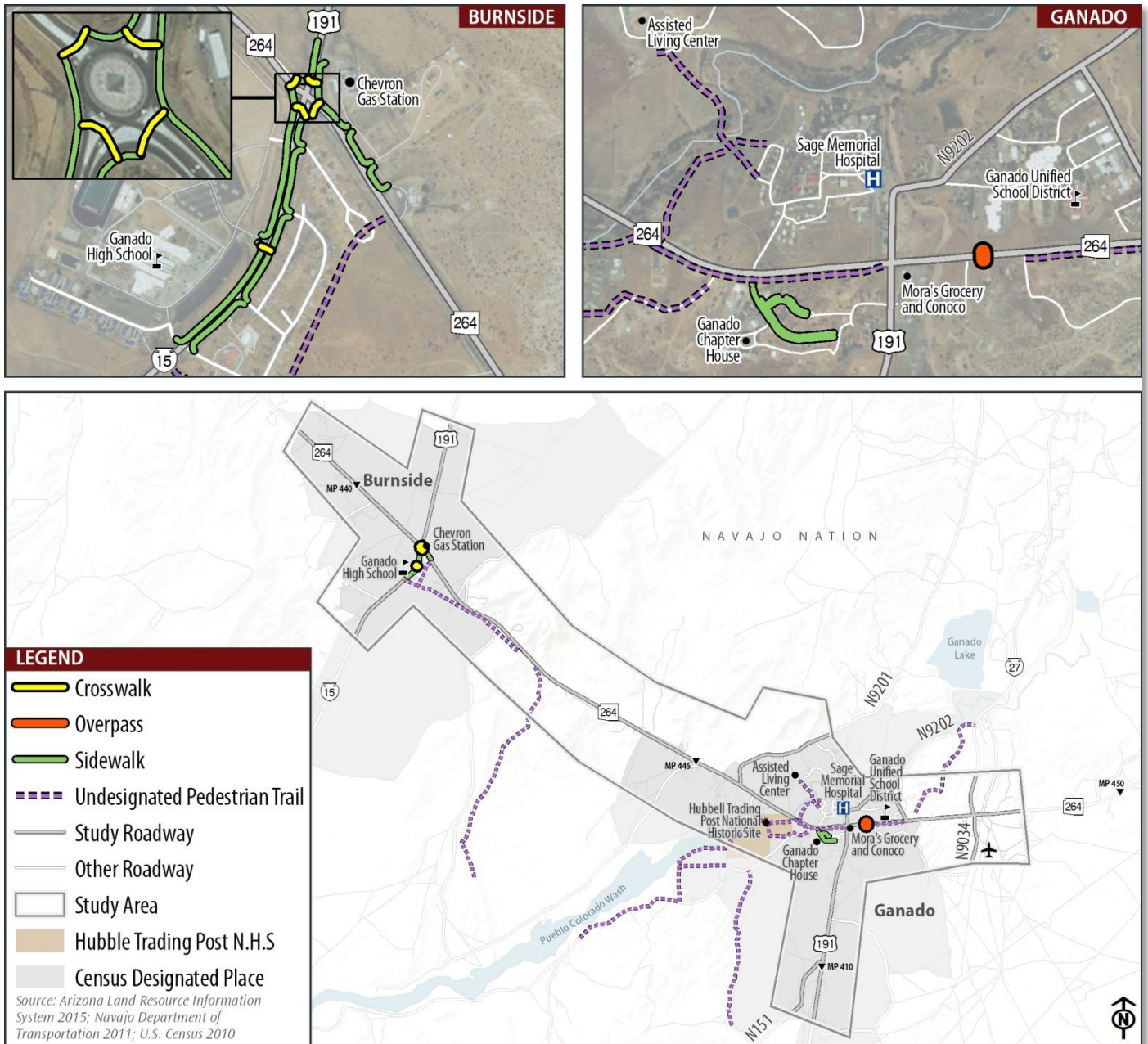


Table 6.1. Pedestrian, Bicycle and Trail Facilities

Road Name	Location	Condition
Pedestrian Facilities		
Cedar Hills Rd	South of SR 260 to Residential Community	Poor condition; not ADA compliant
SR 264	SR 264/US 191/N15 intersection to Mustang Gas (north side of roadway only)	Fair condition; vegetation overgrowth; ADA compliant
SR 264	East of Ganado Unified School District Primary School driveway	Pedestrian overpass; poor condition; vegetation overgrowth; rarely utilized
US 191	SR 264/US 191/N15 intersection to Chevron Gas Station driveway (east side of roadway only)	Fair condition; vegetation overgrowth; ADA compliant
N15	SR 264/US 191/N15 intersection to Ganado High School southern driveway	Good condition; ADA compliant
SR 264/US 191/N15 roundabout		Crosswalks; pavement striping in fair condition
N15: Northern entrance to Ganado High School		Crosswalks; pavement striping in fair condition
Bicycle Facilities		
There are no designated bicycle lanes or multi-use paths within the study area.		
Trails		
SR 264/Co. 420 intersection to N27		Man-made pedestrian path
Ganado Assisted Living Center to Sage Memorial Hospital		Man-made pedestrian path
Sage Memorial Hospital to Hubbell Trading Post National Historic Site		Man-made pedestrian path that follows N427 north and then transverse through the Ganado Wash under the Ganado Wash Bridge to Sage Memorial Hospital
West of Ganado Chapter House to Hubbell Trading Post		Man-made pedestrian path
Hubbell Trading Post National Historic Site to ~two miles south along Ganado Wash		Man-made pedestrian path
South of Hubble Trading Post to Co. 427		Dirt road heavily utilized by pedestrians
Co. 427 to N151		Varies from man-made pedestrian path to dirt road
East side of Co. 426 south of SR 264		Man-made pedestrian path
N15 to SR264 (Behind NHA Housing Development)		Man-made pedestrian path



EXISTING TRANSIT SERVICES

Navajo Transit System (NTS) currently provides transit services within and to/from the Ganado/Burnside study area. NTS currently provides fixed-route transit services to 41 Navajo Chapters. The fare for the transit service is \$2.00 per person for a full day pass. Table 6.2 provides an overview of routes that service the study area, as well as the approximate departure times for local bus stop locations.

Within the study area the following routes are available:

- **Route 1 - Tuba City to Fort Defiance:**
 - Service available Monday – Thursday only
 - Stops include: Mustang Gas Station and US Post Office in Ganado
- **Route 2 - Steamboat to Fort Defiance**
 - Service available Sunday - Saturday
 - Stops include: Mustang Gas Station and US Post Office in Ganado
- **Route 8 - Chinle to Ganado to Tsaile**
 - Service available Sunday - Saturday
 - Stops include: Mustang Gas Station and US Post Office in Ganado
- **Route 9 - Dilkon to Fort Defiance**
 - Service available Sunday - Saturday
 - Stops include: Mustang Gas Station and US Post Office in Ganado, and optional service to Ganado Chapter House or Apache County District Office

Table 6.2. Navajo Transit System (NTS) Routes and Stops within Study Area

Route	AM Service			PM Service		
	Mustang Store (Burnside)	Ganado Chapter House/Apache County Office	Post Office (Ganado)	Post Office (Ganado)	Mustang Store (Burnside)	Ganado Chapter House/Apache County Office
Route 1	8:50AM		9:00AM	3:45PM	3:55PM	
Route 2	6:45AM		7:00AM	6:10PM	6:15PM	
Route 8	6:38AM and 6:55AM	6:42AM	6:45AM	6:00PM	5:45PM and 6:10PM	5:55PM
Route 9	6:37AM		6:53AM	6:00PM	6:10PM	

Source: Navajo Transit System

Key input from TAC members and stakeholders, as well as observations made during the field review, includes:

- There are no designated bus stops; rather the NTS currently picks-up/drops-off passengers in the parking lots of the Mustang Store, Post Office, Ganado Chapter House, and the Apache County District Office.
- Stakeholders commented that the NTS transit routes are often utilized by residents to commute between Ganado and Burnside.
- Stakeholders noted the NTS transit service is heavily utilized and buses are often overcrowded. Passengers are not allowed to stand on the bus; therefore, potential passengers are often required to find other means to reach their destination (i.e., walk, hitchhikes, etc.) when buses are overcrowded.
- School buses pick-up students at specific locations along the shoulders of SR 264 and US 191. Parent’s picking-up/dropping-off students pull-over along the roadways and cause safety and congestion issues.



Commuting Characteristics

Utilizing 2009-2013 American Community Survey (ACS) data, employee commuting patterns and vehicle availability was identified. Table 6.3 summarizes the mode of transportation for workers age 16 and older to commute to work and Table 6.4 outlines the typical travel time to work for Burnside and Ganado CDPs. As presented in the table, approximately 30% of those surveyed in Ganado and Burnside carpooled, walked, or took public transportation to work, while over 65% drove alone.

According to the ACS, the mean travel time for workers in Burnside CDP is 20.1 minutes and 23.8 minutes for Ganado CDP. As outlined in Table 6.4, 41% of employees in the study area have a commute time of less than 10 minutes. This small commute time is probably due to the number of employees in Burnside and Ganado that work locally. An additional 33% of employees have a commute time of over 30 minutes, suggesting that a large number of residents commute to Window Rock, Chinle, Chambers, Fort Defiance, or other regional employment centers.

Vehicle availability may limit a person's ability to commute to work or get to an activity center. Depending on the number of people living in each household, a certain number of vehicles may not be able to provide everyone with a means of transportation. Table 6.5 outlines the total number of vehicles available per occupied housing unit in Burnside CDP and Ganado CDP. According to the 2009-2013 ACS, 13.4% of occupied housing units do not have any vehicles available, forcing residents to utilize alternative means of transportation.

Table 6.3. Means of Transportation to Work (Workers Age 16 and Older)

Means of Transportation	Burnside CDP		Ganado CDP	
	Total Population	Percent	Total Population	Percent
Car, Truck, or Van - Drove Alone	115	51.8%	232	75.1%
Carpooled	13	5.9%	10	3.2%
Public Transportation	9	4.1%	8	2.6%
Walked	70	31.5%	49	15.9%
Other Means	2	0.9%	0	0.0%
Worked at Home	13	5.9%	10	3.2%
Total	222	100.0%	309	100.0%

Source: U.S. Census Bureau, 2009-2013 American Community Survey

Table 6.4. Travel Time to Work (Workers Age 16 and Older That Don't Work At Home)

Travel Time	Burnside CDP		Ganado CDP	
	Total Population	Percent	Total Population	Percent
Less than 5 Minutes	21	10.0%	65	21.7%
5 to 9 Minutes	77	36.8%	46	15.4%
10 to 19 Minutes	28	13.4%	57	19.1%
20 to 29 Minutes	24	11.5%	20	6.7%
30 to 89 Minutes	54	25.8%	102	34.1%
Greater Than 90 Minutes	5	2.4%	9	3.0%
Total	209	100.0%	299	100.0%

Source: U.S. Census Bureau, 2009-2013 American Community Survey



Table 6.5. Vehicles per Household (Occupied Housing Units)

Number of Vehicles	Burnside CDP		Ganado CDP	
	Housing Units	Percent	Housing Units	Percent
No Vehicles Available	32	21.8%	31	9.6%
1 Vehicle Available	80	54.4%	184	57.1%
2 Vehicles Available	25	17.0%	66	20.5%
3 Vehicles Available	6	4.1%	37	11.5%
4 or More Vehicles Available	4	2.7%	4	1.2%
Total	147	100.0%	322	100.0%

Source: U.S. Census Bureau, 2009-2013 American Community Survey

AVIATION CONDITIONS

In order to gain a better understanding of all of the factors contributing to the regional transportation conditions, it is important to consider air travel. Located along N9304 is the Ganado Airport that primarily serves medical transportation to and from Sage Memorial Hospital. The Ganado Airport covers approximately 47 acres and has one runway designated 18/36 with a dirt surface measuring 4,500 by 80 feet. According to the *2000 Arizona State Aviation Needs Study*, the Ganado Airport has multiple obstructions and issues that require mitigation in order to safely accommodate air traffic, including: no line of sight between runway ends, water on runway and gulleys after heavy rain, livestock present.



A master plan and initial design (2008) for a 6,600' x 75' paved runway has been completed. The design called for paving the runway; installing runway lighting; constructing a 250 sq. ft. building, pilot waiting area, rest room, and installing utilities.

7. EXISTING TRANSPORTATION ISSUES

This chapter presents a summary of existing transportation issues based on a comprehensive field review, technical data analysis, and feedback from stakeholders and TAC members.

INTERSECTIONS

The study area consists of five critical intersections and the following section provides a summary of the key issues and deficiencies identified at each intersection.

State Route 264/US Highway 191/Navajo Route 15

Intersection Type: Four-way intersection **Traffic Control Type:** One-lane roundabout
Adjacent Uses / Activity Centers: Residential housing development to the east and west of N15; Ganado High School to the west of N15; Chevron gas station and a Burger King restaurant on the northeast corner. Roundabout is heavily utilized by school buses and students walking to the Chevron Gas station and Burger King.

Issues, Concerns, and Needs:

Congestion and Mobility:

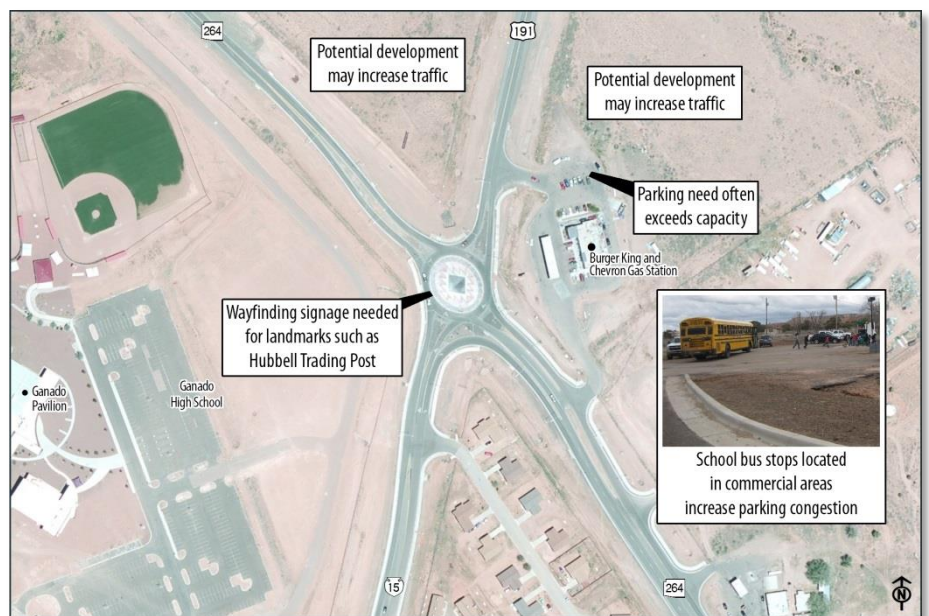
- Stakeholders commented that the roundabout was an effective way of moving vehicular traffic through the intersection.
- Southbound PM approach is projected to operate at a LOS C by 2035, if no roadway improvements are made.
- Vehicle congestion is caused when parking capacity is exceeded at the Chevron gas station from vehicles meeting school and NTS buses.

Multimodal:

- Pedestrians do not utilize designated crosswalks and walk haphazardly across the intersection.
- Sidewalks needed as development occurs.

Miscellaneous:

- Wayfinding signage is needed to provide tourists with necessary travel information.



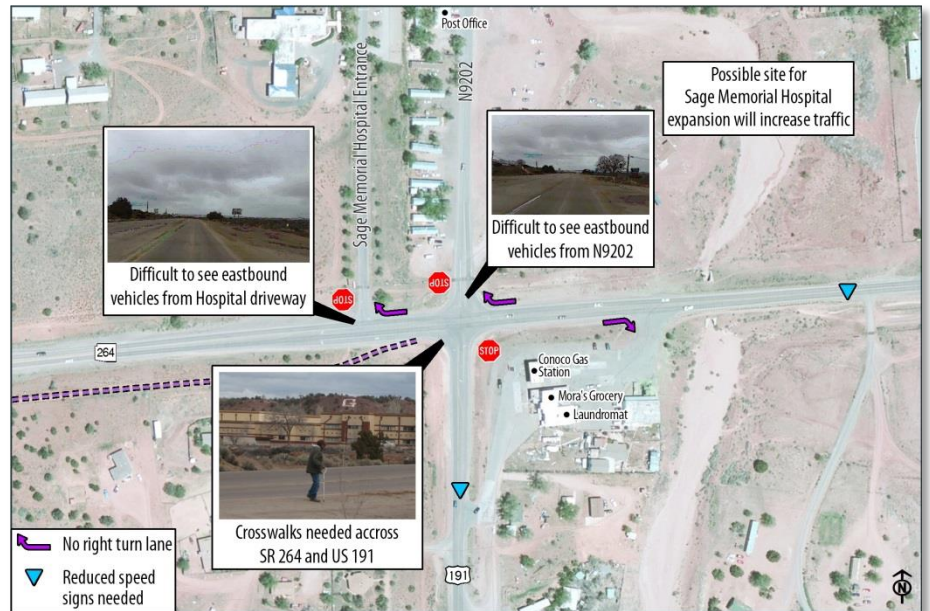
State Route 264/US Highway 191/Navajo Route 9202

Intersection Type: Four-way intersection **Traffic Control Type:** Two-way stop controlled intersection
Adjacent Uses / Activity Centers: Conoco Gas Station, grocery store, and laundromat on the southeast corner; Post Office and Sage Memorial Hospital on the northwest corner; Residential housing development on the southwest corner.

Issues, Concerns, and Needs:

Congestion and Mobility:

- US 191 northbound approach is projected to operate at a LOS F by 2035, if no roadway improvements are made.
- Increased traffic from the future expansion of the Sage Memorial Hospital and area developments may warrant the installation of a traffic signal.
- Vehicles exiting the Conoco gas station to travel westbound on SR 264 have to contend with vehicles traveling at high speeds.
- Westbound vehicles on SR 264 entering the Conoco gas station stop on the travel lanes blocking traffic and resulting in queuing and unsafe conditions.
- Installing right-hand turning lanes into Conoco Gas Station, N9202, and the Sage Memorial Hospital may help to improve safety and traffic congestion.
- Installing traffic calming measures to slowdown vehicles approaching the intersection, adding center-turn lanes to the east and west of the intersection, and improving access management of driveways in the immediate vicinity of the intersection may help to improve safety.



Safety and Infrastructure:

- Driveways in close proximity create multiple turning movement conflicts.
- High number of intersection-related crashes occurred. "Failure to yield right-of-way" is cited as the predominant cause for crashes at the intersection.
- Vehicles travel through the intersection at much higher speeds than the posted speed limits resulting in potentially unsafe conditions.
- Motorists on Sage Memorial Hospital and N9202 have difficulty seeing eastbound vehicles due to terrain.
- Limited street lighting.

Multimodal:

- Intersection does not have designated sidewalks or crosswalks.

Miscellaneous:

- Adding wayfinding signage and streetscaping will enhance the overall characteristic of the area and provide tourists with necessary travel information.



State Route 264/Navajo Route 9201

Intersection Type: T-intersection

Traffic Control Type: One-way stop controlled intersection

Adjacent Uses / Activity Centers: N9201 serves as the main access road to the Assisted Living Center and residential areas located to the northeast of the intersection.

Issues, Concerns, and Needs:

- Motorists turning left from N9201 onto SR 264 have difficulty seeing oncoming westbound traffic. A hill located on the northeast corner of the intersection causes sight distance issues.
- Warning signs on SR 264 are needed to alert drivers of approaching intersection.
- Pavement striping at the intersection is deteriorating.
- Stop bar is needed on N9201 to alert drivers of appropriate stopping location.



State Route 264/Navajo Route 427

Intersection Type: Four-way intersection

Traffic Control Type: One-way stop controlled intersection

Adjacent Uses / Activity Centers: Navajo Route 427 serves as the main access road to the Hubble Trading Post.

Issues, Concerns, and Needs:

- As the primary driveway to the Hubble Trading Post, intersection is one of the busiest intersections in the study area.
- N427 intersects SR 264 at an angle which makes it difficult for large vehicles approaching from the west to navigate the sharp turn.
- Due to terrain and high speeds on SR 264, motorists exiting the Hubble Trading Post often have difficulty seeing oncoming westbound traffic.
- Pavement striping is deteriorating at the intersection.



State Route 264 / Navajo Route 27 / Navajo Route 9034

Intersection Type: Four-way intersection **Traffic Control Type:** Two-way stop controlled intersection
Adjacent Uses / Activity Centers: N27 provides access to the recreational facilities and also serves as an alternative route to Chinle. N9034 serves as the main access to the Ganado Airport.

Issues, Concerns, and Needs:

- N27 southbound approach is projected to operate at a LOS C by 2035, if no roadway improvements are made.
- Speed limits on N27 and SR 264 do not reduce from 55 mph approaching intersection.
- No right-turn lane on N27. Pavement striping is also deteriorating.
- Stakeholders commented that turn-lane widths should be widened.
- Stop sign on N27 is offset from roadway, making it difficult to see.
- Limited sight distance for vehicles approaching intersection.
- Seven intersection related crashes and two fatal crashes occurred at this intersection, of which they were primarily cited as “failing to yield to right-of-way” or “following too closely”.
- Safety mitigation measures, such as rumble strips and signage to warn drivers of approaching intersection, as well of pavement restriping and lane reflectors, would increase driver awareness.
- As development occurs at the Ganado Airport, increased traffic may make westbound turning movements onto SR 264 more difficult.



US 191 / N151

Intersection Type: T-intersection **Traffic Control Type:** One-way stop controlled intersection
Adjacent Uses / Activity Centers: N151 is primarily used to access Cornfields Chapter and it also provides access to nearby residential areas.

Issues, Concerns, and Needs:

- N151 intersects US 191 on a downslope angle; due to terrain and high speeds, motorists turning onto US 191 may have difficulty seeing oncoming northbound traffic.
- Northbound vehicles turning onto N151 often have difficulty making the sharp turn.
- Located on the bottom of a hill, N151 experiences significant drainage issues that need to be mitigated to allow vehicles to safely pass through the intersection.
- The stop sign on N151 is offset from roadway, making it harder to see the sign in time.



ROADWAY CORRIDORS

SR 264, US 191, N15, N9201, N27, N9202, and N151 are the major corridors in the study area. The following section provides a summary of the key issues, deficiencies, and needs identified for each corridor.

State Route 264

SR 264 is an ADOT maintained two-lane highway that connects the communities of Ganado and Burnside, as well as serves as a major regional corridor connecting several communities in the Navajo Nation. SR 264 is currently scheduled for pavement preservation, roadway widening to include paved shoulders with rumble strips, new guardrails, and new signage and cattle guards.

Issues, Concerns, and Needs:

Congestion and Mobility:

- Currently operates at a LOS C between N9201 and SR 264/US 191/N9202 intersection and LOS D from SR 264/US 191/N9202 intersection to eastern study boundary.
- By 2035, projected to operate at LOS C between N15 and N9201 and LOS D from N9201 to eastern study boundary, if no roadway improvements are made.
- Alternative routes between Ganado and Burnside need to be identified to alleviate congestion.
- Commuter traffic to the Ganado/Burnside area can cause heavy traffic congestion and queuing during the morning and evening rush hours.
- Lack of sufficient turn lanes along the corridor forces the motorists to stop on the travel lane to make left turns resulting in significant rear-end and turning movement related crashes.
- School buses pick-up/drop-off students residing on unpaved local roadways along the side of the corridor. Parents pull-over on the side of the highway and cause traffic congestion and create unsafe conditions for motorists and pedestrians.
- Planned expansion of the Sage Memorial Hospital, airport improvements, and planned developments in Burnside and in Ganado will significantly increase traffic and may cause traffic congestion.

Multimodal:

- Pedestrians often utilize the highway's shoulders to access activity centers in Ganado and Burnside and for recreational purposes. Due to poor shoulder conditions and wide cattle guards on side streets, pedestrians often are forced to enter travel lanes.
- Cattle guards lack side gates to allow safe passage for pedestrians.

Safety and Infrastructure:

- Pavement conditions are primarily in fair to poor condition with potholes, surface bleeding, and cracks throughout the corridor.
- Pavement striping is deteriorating at the intersection with N27. Pavement restriping and lane reflectors would enhance safety of the roadway and increase driver visibility at night.
- No reduction in speed near Ganado Unified School District and approaching N27 intersection.
- Stakeholders commented that electronic speed limits signs would be beneficial near SR 264/US 191 intersection.
- Shoulders need to be widened and leveled to provide safe locations for disabled vehicles and to allow vehicles to pull over for emergency service vehicles.
- Key intersections that may require turn lanes or additional improvements such as signage include: Conoco station driveways, entrance to Sage Memorial Hospital, N9201, N9202, N427, County Route 420, and the entrance to the Ganado Unified School District.
- A high number of crashes also occurred where the passing lanes end east of Burnside.
- Large vehicles approaching the entrance to the Hubble Trading Post from the west have difficulty navigating the sharp turn onto the roadway. Additionally, large vehicles have difficulty exiting the cross-street.
- Additional signage is needed to alert drivers of:
 - Approaching SR 264/N27 intersection.
 - School bus stops along the corridor and the entrance to the Ganado Unified School District and Ganado High School.
 - Truck traffic entering/exiting the Ganado Transfer Station.
 - Fire trucks exiting the Fire Station during emergency situations.



State Route 264 (Continued)

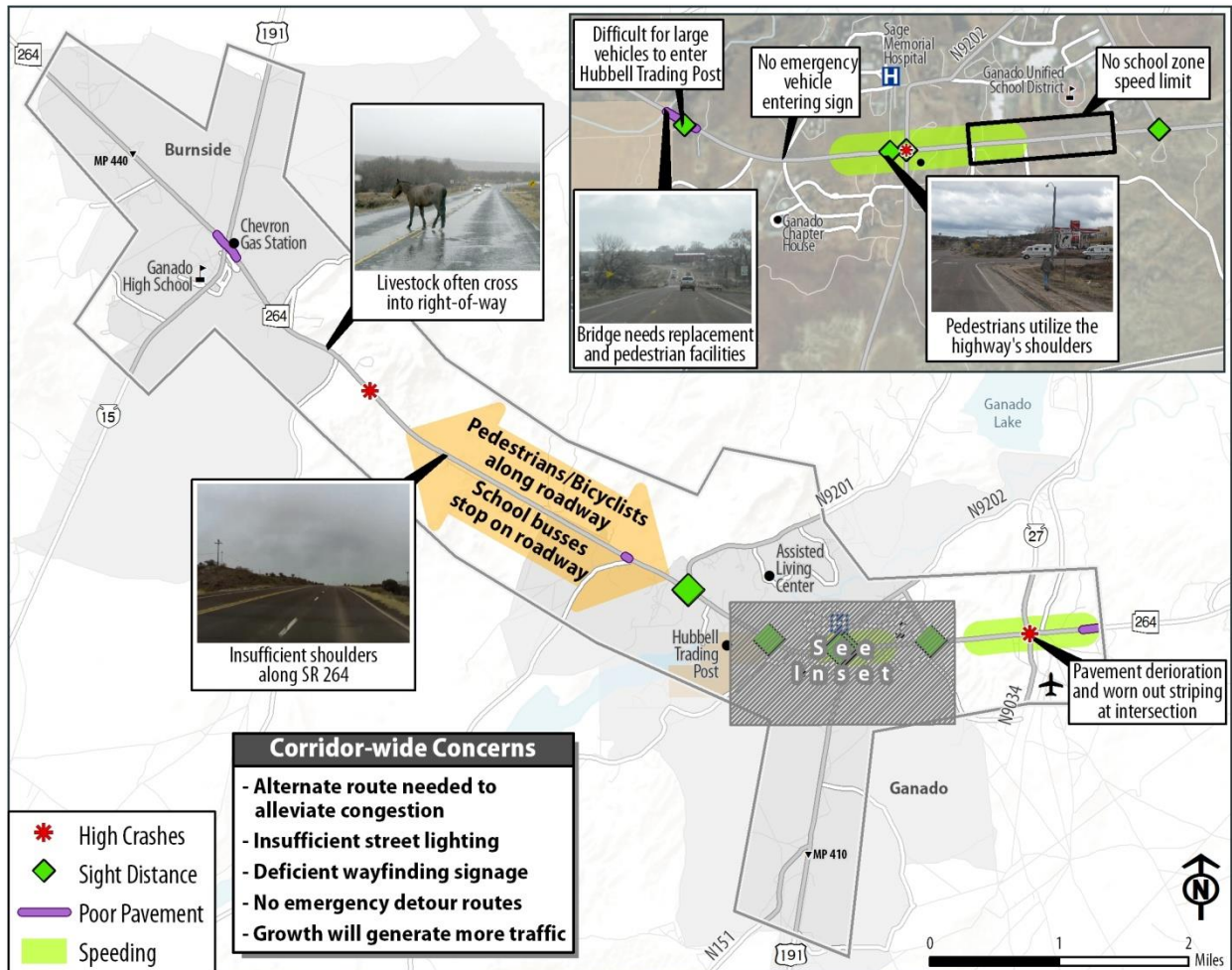
Issues, Concerns, and Needs:

Safety and Infrastructure (Continued):

- Sight distance issues on cross-streets include:
 - N9201 – Motorists turning on/off SR 264 have limited sight distance and have to contend with high speed westbound traffic.
 - Entrance to Hubble Trading Post - Motorists exiting the Hubble Trading Post have limited sight distance and also have to contend with high speed westbound traffic.
 - Entrance to Sage Memorial Hospital – Motorists turning onto SR 264 have difficulty seeing oncoming eastbound traffic due to a hill that limits sight distance.
 - US 191– High speed eastbound traffic coupled with a hill east of the intersection may limit motorist sight distance.
 - County Route 420– Motorists turning onto SR 264 from County Route 420 have difficulty seeing oncoming high speed traffic due to the terrain west of the intersection.

Miscellaneous:

- Street lighting and roadside reflectors would increase motorists' nighttime visibility and improve safety.
- Rural addressing and signage is needed to improve emergency response times.
- Installing wayfinding signage and streetscaping will enhance the overall characteristic of the corridor and will also provide tourists with necessary travel information.
- Barb wire fencing and metal posts are in poor condition.
- Due to open range practices, cattle often enter the roadway's right-of-way. Mitigation measures are needed to prohibit animals from accessing travel lanes.
- Existing cattle guards are full of water and/or debris allowing livestock to enter the right-of-way.
- The Ganado Wash Bridge is in poor condition and is eligible for replacement. Currently the bridge lacks a pedestrian walkway, causing pedestrian to utilize travel lanes to cross the bridge.



US 191

US 191 is an ADOT-maintained two-lane highway that serves as a major regional corridor that connects the study area to I-40 in the south and Chinle to the north. US 191 is also utilized to access residential communities along N151 as well as the cemetery to the east.

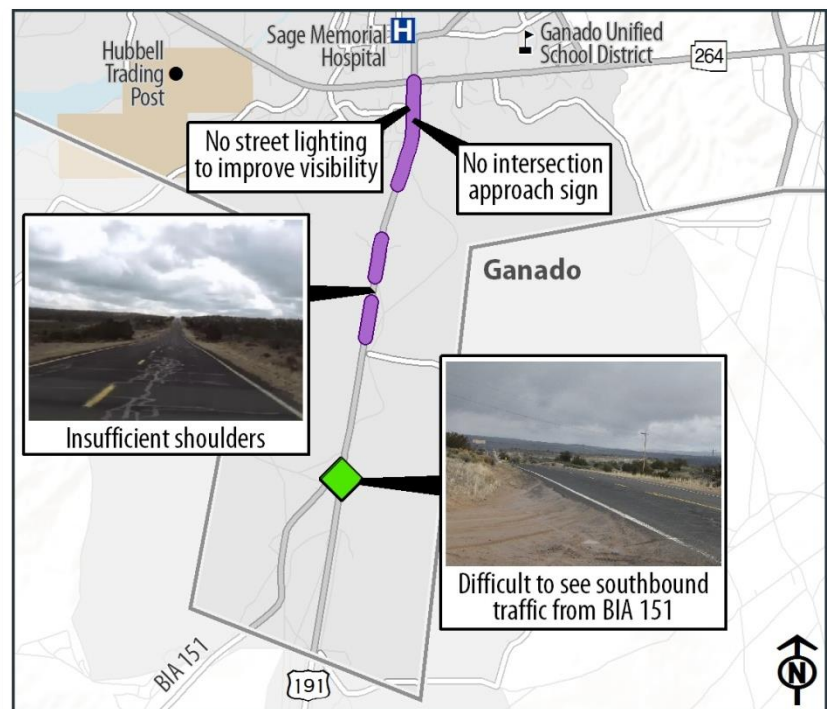
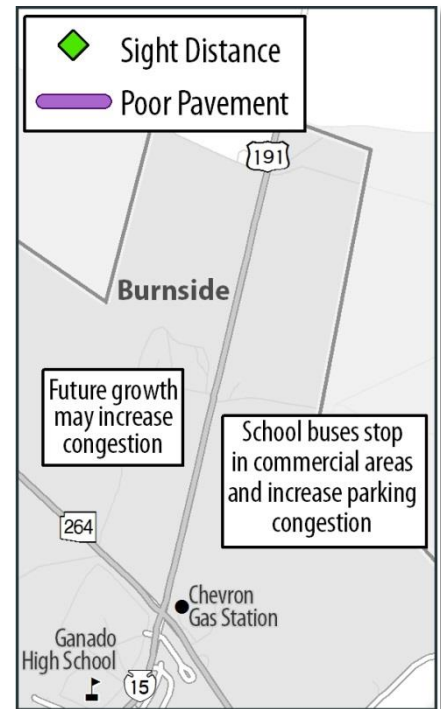
Issues, Concerns, and Needs:

Congestion and Mobility:

- By 2035, projected to operate at LOS C from SR 264/US191/N15 intersection to northern study boundary, if no roadway improvements are made.
- Vehicle congestion caused by exceeding the Chevron gas station parking capacity from vehicles meeting school and NTS buses.

Safety and Infrastructure:

- Pavement is in poor condition with significant cracking, surface bleeding, and raveling.
 - Reducing speed limit and installing community gateway signage would alert drivers that they are approaching a residential and business area and need to slow down.
 - Installing street lighting at the entrance to Ganado would improve pedestrian safety, motorists' nighttime visibility, and overall safety along the corridor.
 - Lane and shoulder reflectors would increase night time driver visibility.
 - Shoulders need to be widened and paved south of Ganado to provide safe locations for disabled vehicles, to allow vehicles to pull over for emergency service vehicles, and to provide bicyclists and pedestrians with a safe buffer zone from vehicular traffic.
 - Corridor heavily utilized by pedestrians to access employment locations, the Conoco gas station, additional activity centers, and residential areas.
 - Since the roadway is located on open range land, mitigation measures to prohibit animals from accessing the right-of-way should be installed.
- Multimodal:**
- Currently there are no pedestrian facilities, forcing pedestrians to walk along the road's narrow shoulders.



Navajo Route 15

N15 is a two-lane roadway, with a center turn lane in Burnside, which connects SR 264 to SR 77. N15 serves as the main corridor to access the Ganado High School, Ganado High School employee housing, and residential areas.

Issues, Concerns, and Needs:

- By 2035, projected to operate at LOS C, if no roadway improvements are made.
- The pavement condition is generally in fair to poor condition with cracking, raveling, and surface bleeding. Additionally, the corridor has curbed shoulders within the study area; however, they are in poor condition.
- The corridor is heavily utilized by pedestrians accessing the Ganado High School, the Chevron Gas Station, and the residential housing development.
- During events at the Ganado Pavilion and the school gym, vehicles have been known to park along the roadway when parking capacity is exceeded.
- Street lighting for school and residential areas on the N15 corridor is lacking.

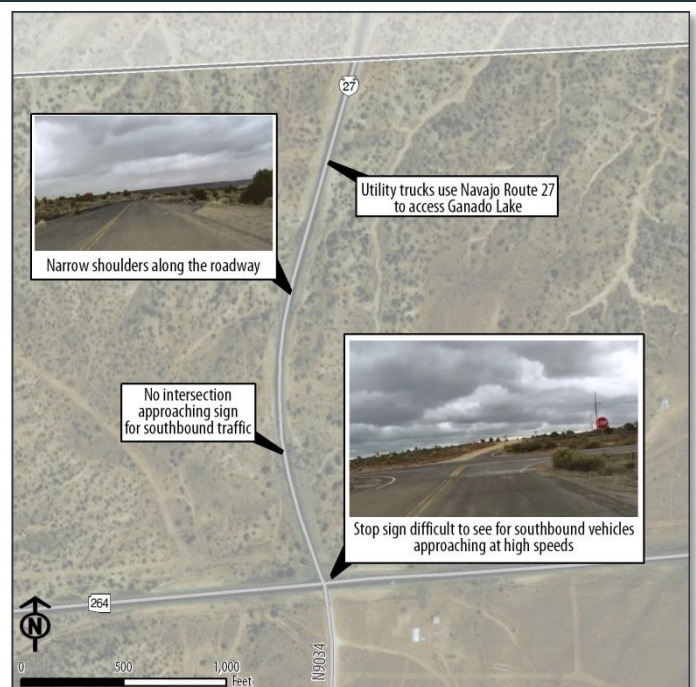


Navajo Route 27

Connecting SR 264 to Ganado Lake and Nazlini, N27 is heavily used by utility trucks as well as commuters. Currently, the corridor is a two-lane, paved roadway in fair condition. Within the study area, N27 has narrow paved shoulders in fair condition.

Issues, Concerns, and Needs:

- Due to the roadway being paved, motorists often travel at high speeds creating unsafe traveling conditions for pedestrians.
- Speed limits are not reduced from 45 mph approaching SR 264 intersection and no warning is provided to motorists of the intersection.
- Safety mitigation measures, such as rumble strips and signage to warn drivers of approaching intersection, as well as pavement restriping and lane reflectors, would increase driver awareness.

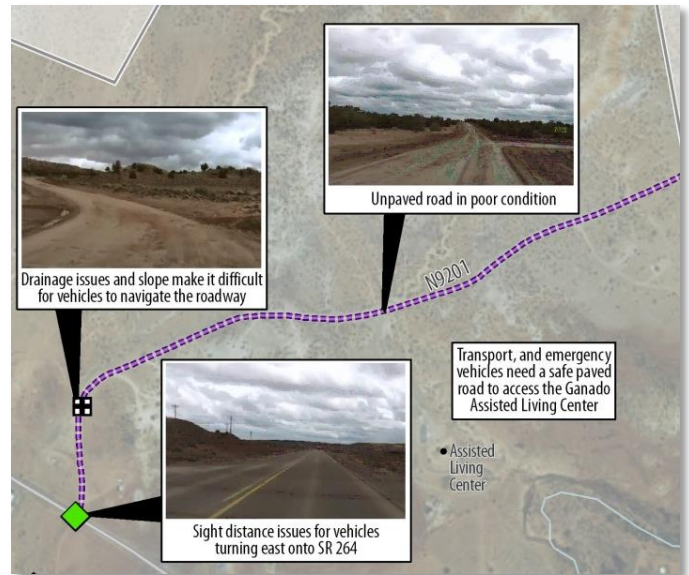


Navajo Route 9201

N9201 is an unpaved roadway that connects the Ganado Assisted Living Center to SR 264.

Issues, Concerns, and Needs:

- As an unimproved roadway, N9201 is susceptible to severe drainage issues during adverse weather.
- Converting the roadway from a dirt road to a gravel road would reduce the number of roll-over accidents.
- When the road is impassable, there are no alternative routes available to access SR 264
- Rural addressing and signage is needed to improve emergency response times.



Navajo Route 9202

N9202 is a two-lane roadway that connects SR 264 to N 27 north of the Ganado Unified School District. The route primarily serves as a local connector for residents to access the school, employment centers, the US Post Office, and residential areas.

Issues, Concerns, and Needs:

- South of the Ganado Wash Bridge, the roadway is in poor condition with significant pot holes, raveling, and cracking; north of the bridge the roadway is in fair condition.
- The corridor lacks striping to assist with driver visibility of the roadway.
- Due to the steep terrain, the corridor can experience significant drainage issues, particularly near Ganado Wash.
- Traffic congestion can be experienced on the corridor during the Friday Flea Market and during school hours.
- Located just north of the main intersection in Ganado, the corridor would benefit from the installation of street lighting and pedestrian facilities.

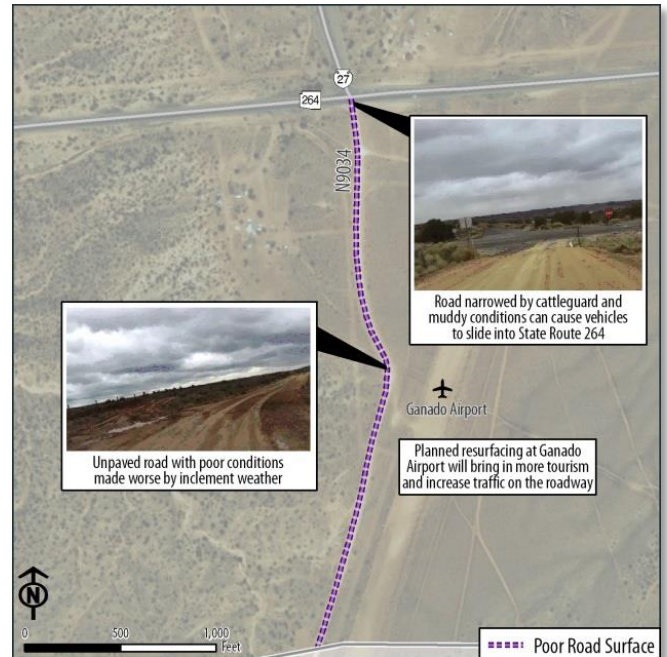


Navajo Route 9034

N9034 serves as the primary entrance to the Ganado Airport. Currently, the roadway is a graded, unpaved roadway that transverses over rolling terrain.

Issues, Concerns, and Needs:

- The roadway has deep ruts, which during adverse weather may make the road hazardous or impassable.
- South of SR 264, a cattle guard narrows the roadway.
- Planned improvements to pave the Ganado Airport may increase tourist usage and may warrant the grading and paving of the roadway.



Navajo Route 151

Located south of Ganado, N151 provides access to a residential area as well as to farming areas.

Issues, Concerns, and Needs:

- The roadway is currently unpaved and susceptible to severe drainage issues. During adverse weather the roadway is rutted and muddy, making driving difficult or the road impassable.
- At the intersection of US 191, the roadway has several drainage issues and can become covered with mud.
- The intersection with US 191 is at an angle, limiting sight distance of oncoming high speed traffic.

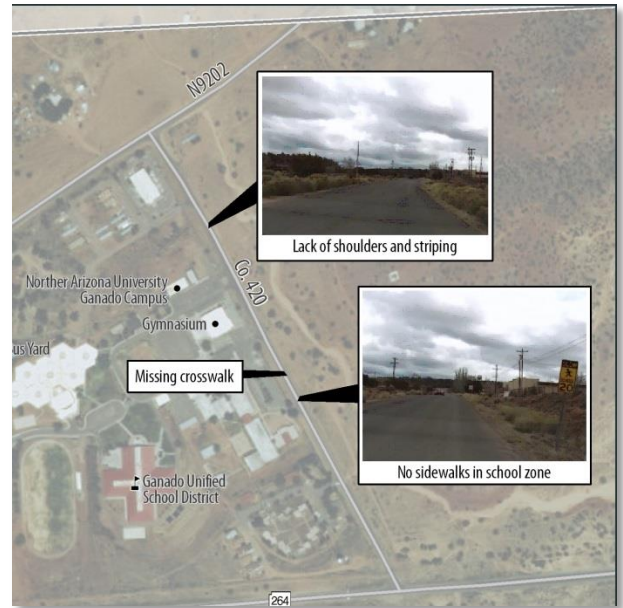


County Route 420

Located in Ganado, County Route 420 is a two-lane, paved roadway that intersects SR 264 east of Ganado Unified School District. The roadway provides access for residents and students to the schools. This road is frequently used by school buses to access the bus storage yard, as well as utility trucks accessing Ganado Lake. As a major access route to the school, the corridor is designated as a school zone with a speed of 20 mph. The road surface is in good condition; however, there are no shoulders or sidewalks along the road.

Issues, Concerns, and Needs:

- Pedestrian sidewalks and crosswalks needed for students to safely access the school.
- Frequently utilized by school buses to access the bus storage yard, as well as utility trucks accessing Ganado Lake.
- Road surface is in good condition; however, there are no shoulders along the road.



MULTIMODAL

Pedestrian, Bicycle, and Trail Facilities

Walking and bicycling are important facets of a community's mobility, economic development, and public health. Walking and biking are particularly important modes of transportation for children, elderly, and persons that do not have access to a vehicle.

Issues, Concerns, and Needs:

- Study roadways require street lighting in order to provide pedestrian and vehicular safety.
- Sidewalks or multi-use trails are needed at:
 - SR 264: Local residents and students often walk and run on the road shoulders to access residential areas, activity centers, and for personal health. Due to the narrow shoulders and large cattle guards, often pedestrians must enter the roadway. Additionally, the Ganado Wash Bridge does not accommodate pedestrian or bicycle facilities.
 - US 191: From Ganado to the cemetery.
 - Ganado Chapter House: Access from SR 264 to the Ganado Chapter House.
 - Elderly Center: Between the Elderly Center and the Sage Memorial Hospital.
 - Local roadways to access activity centers and bus stops.
- Existing sidewalks along Cedar Hills Road are in poor condition.
- Students walking to/from the Ganado High School do not utilize the pedestrian crosswalks and cross the intersection at various locations throughout the roundabout, creating potential pedestrian-vehicle conflicts.
- The pedestrian-overpass bridge is rarely utilized, rather residents and students cross SR 264 mid-block.
- Crosswalks are needed at the SR 264/US 191 intersection in Ganado.
- There are no bike lanes in the study area.
- There is currently no official trail system in the study area. Residents have established several man-made trails for recreational and commuting purposes.
- A continuous network of pedestrian, bicycle, and trail facilities would provide additional transportation options between activity centers, promote economic development, and would encourage physical activity.

Transit Services

Issues, Concerns, and Needs:

- Buses are often overcrowded; therefore, many passengers are unable to obtain a ride and must either hitchhike or walk to/from their destination.
- School buses drop-off/pick-up students at the Burger King parking lot, Chevron entrance, and along the SR 264 corridor. This causes traffic delays and creates potential vehicle-pedestrian conflicts.
- Pullouts are needed on SR 264 and US 191 to provide NTS and school buses a safe area to load and unload passengers and to improve traffic flow.
- Bus shelters, signage and lightning are needed at stop locations to improve passenger safety.
- As development occurs, additional transit routes or increased frequency may be required to meet demand.



APPENDIX A. STAKEHOLDER MEETING SUMMARY



PROJECT STAKEHOLDER MEETINGS

Date:	March 3, 2015
Time:	9:00 AM – 5:30 PM
Location:	Ganado Chapter House Conference Room

Attendees

See attached sign-in sheets.

Meeting # 1 Summary (9:00 AM – 10:15 AM)

Transportation Agency Officials

■ Safety and Infrastructure Concerns

- Need to include the NDOT Safety Division Manager on the TAC list.
- Intersection safety is important.

■ Congestion and Mobility Conditions

- Margie Begay presented the results of the NDOT traffic counting effort. She presented Don Sneed with a copy of the report. Don will have Jacobs scan the report for consideration and distribution to the study team. Vamshi will coordinate the receipt of electronic files and spreadsheets.
- Question about the Navajo Nation LRTP update; Margie indicated that their LRTP update is in progress and public meetings will be scheduled in the near future.

■ Pedestrian, Bicycle and Transit

- Pedestrian trails and sidewalks are needed both in the Ganado/Burnside areas as well as between them.
- Transit system is used by local residents.

■ Future Conditions and Needs

- Margie indicated that improvements were being planned to renovate the Ganado Airport and the access road need major improvements. According to ADOT’s Aviation Plan, \$5.36 million is planned for improvements to the Ganado Airport over the next 5-years.
- Paving of the access road to the airport (BIA-9034) is currently not funded.
- Jacobs to follow up with the Holbrook District for future roadway improvement efforts. (See follow-up notes below).

Meeting # 2 Summary (10:30 – 11:45 AM)

Health, Safety and School Officials

■ Safety and Infrastructure Concerns

- 264 Hubble Bridge is too narrow; there is no pedestrian walkway across the bridge.
- Animals are on the road, including cattle, horses, and sheep.
- Speeding is an issue; there is only 1 officer assigned to the Ganado area so it is difficult to enforce speed limit. Need to slow traffic down through the Ganado area.
- High crashes occur at the N-27/SR 264 intersection; consider a roundabout.
- There is no right turn lane to Post Office road.
- Sage Hospital entrance is located too close to the SR 264/US 191 intersection.
- Street lighting is needed, consider solar lights.
- Signing and way-finding is needed especially for the Hubble Trading Post.
- Access to the Hubble Trading Post is confusing with the Church located nearby; turning radii is difficult for RVs to negotiate. (Note: Discussion With employees at the Hubble Trading post indicated their concern about the entrance and better signing for the National Park.)

■ Congestion and Mobility Conditions

- Sage is planning major expansion improvements that will impact the traffic flow.
- Airport improvements are planned to reopen the Ganado Airport; medical flights and tourism flights could increase traffic.

■ Pedestrian, Bicycle and Transit

- Pedestrians cross the highway (SR264) to access the Post office and Mora's Conoco station/food mart.
- People use the road (walking) to access the hospital
- Need regular crossings of SR 264 for pedestrians.
- Consider pedestrian needs locally and between Ganado and Burnside.
- People walk along the highway to access Hubble Trading Post to buy supplies.
- Pedestrian trail improvements are needed.
- A multi-modal trail 10-12 feet wide is needed (ATV trail south side of highway).

■ Future Conditions and Needs

- Tourism is big for Ganado; better advertising could bring even more visitors.
- Hospital Expansion is planned in the near future.
- Burnside development will cause congestion issues.
- Housing development plans are being considered.
- Ganado may become a regionalized hub for other nearby chapters.
- There is a new natural gas line planned to be constructed in the near future.
- A new 4G tower is planned to be constructed. Fiber optic improvements are also being planned.

Meeting # 3 Summary (1:00 PM – 2:15 PM)

Economic Development, Housing and Utility Stakeholders

■ **Safety and Infrastructure Concerns**

- NTUA is planning a new natural gas line from Ganado to Burnside. Project is in design phase and is waiting for funding to construct. Plans will be sent to Jacobs showing the location of the new gas line. The new gas line is completely outside the ADOT right-of-way.
- NTUA will also provide Jacobs with the general location of all existing utilities in shape files format.
- Speeding is an issue and speed humps are planned on several local streets.
- Fencing and animal control is a concern.

■ **Congestion and Mobility Conditions**

- The planned economic and housing development in Burnside will cause congestion in that area.
- Improvements to BIA-27 are planning (Paving) to provide secondary access from Ganado to Chinle.

■ **Pedestrian, Bicycle and Transit**

- Consider trails within the ADOT right of way.
- Pedestrian lighting is needed.

■ **Future Conditions and Needs**

- The Chapter has completed a Design for Sustainability effort and will provide a copy to Jacobs.
- Fiber optics is needed for the schools and the hospital.
- The local street addressing project is in progress, a 411 emergency system is being implemented.

Meeting # 4 Summary (3:15 PM – 4:30 PM)

Ganado Chapter Planning Committee

■ Presentation to the Planning Committee

- Don Sneed presented the study background, the development of the objectives, the PARA application process, how ADOT funds and manages the study, the selection process and announced that Jacobs Engineering was selected to conduct the study. He introduced Rick Powers of Jacobs Engineering, a senior project manager to make a short presentation of the Ganado/Burnside study. Rick passed out a PowerPoint presentation (see attached) and made a short overview of the study process, timelines, goals and objectives.

■ Chapter President Comments

- Chapter President Mr. Vince R. James thanked the study team for spending the past 2-days meeting with stakeholders and touring the roads.
- He encouraged the community to support and participate in the public meeting to be held in May or June.
- He indicated the community's efforts to initiate this study and it has been discussed during many previous meetings and he is please the study is underway.
- He has personally committed to participate in the study along with Elizabeth Kuipers and Harry J. Yazzie.
- He identified several stakeholders that were in attendance and asked Mr. Powers to obtain their contact information. He also asked for them to meet with our team to share their concerns about transportation.

■ Kirk Arviso Comments

- Kirk was pleased to start this study and was grateful to have the same study team that recently completed the Fort Defiance study that has lead to the implementation of a 2.5 mile street lighting project. He also encouraged community participation in the study effort.

■ Questions/Comments

- Speeding is out biggest concern; we need flashing signs near the school as people come down the hill.
- Another comment about speeding and lack of enforcement, consider lowering speed limit.
- Concern about the safety of children boarding buses. Bus pull-outs are needed.
- We need a 4-lane highway, when could that be built?
- Concern about livestock on or along the roads.
- Don Sneed thanked everyone for their comments and indicated we had captured them for consideration. We are not going to respond at this time, but greatly appreciate the comments/concerns.
- The Chapter provided copies of previous studies, Jacobs will scan and return.
- Jacobs took photographs of the recently completed Sustainability Study presentation boards; the Chapter is still searching for the accompanying report binder and will provide at a later date.

Meeting # 5 Summary (4:30 PM – 5:30 PM)

Ganado Health, School, Community Stakeholders

■ Safety and Infrastructure Concerns

- We need a 4-lane highway (Echoed by all attendees).
- Speeding is a major concern, lack of enforcement. Speeds are in excess of 70 mph.
- Animals on the road is a concern.
- Warning signs are needed on US 191 entering Ganado from the south.
- Pedestrian access is needed along US 191 south of Ganado to provide access to the cemetery.
- School bus pull-outs are needed along SR 264.
- There are several crashes on SR 264 near the water tanks where the climbing lane ends. People speed to pass at the end of the climbing lane.
- Fix the dip in the roadway, SR 264 between C426 and the wash.
- Access to houses along SR 264 is a safety concern.
- BIA 9201 and the access road to the Assisted Living Center needs to be paved.
- Better access to the rodeo grounds is needed.

■ Congestion and Mobility Conditions

- Development at Burnside will be a major draw to neighboring communities and pass through tourists.
- Transit services are currently provided to 24 clients by Assisted Living Center, 3 vehicles from ADOT.

■ Pedestrian, Bicycle and Transit

- The Ganado Wash Bridge needs pedestrian sidewalks.
- Consider moving the existing pedestrian overpass to Burnside to provide crossing of N-15.
- More trails are needed.
- There are more walkers and runners than bicyclists.
- Transit medical clients have homes off of SR 264, it is hard to make the left turns in heavy traffic.

■ Future Conditions and Needs

- Increased traffic will dictate need for bus pull-outs for school children safety.
- Proposed Senior Center and Veterans building is planned just east of Ganado Wash Bridge on SR 264.
- Need more highway patrol personnel in Ganado area.
- Development at Burnside will happen.
- There is development planned behind the Chapter House.
- ADOT needs to expand the maintenance facilities in Ganado.
- Several existing trails were identified by the Chapter President as shown on the aerial map.
- Navajo Technical University is also planning a facility on the NE section of the SR 264/US 191 intersection.

Stakeholder Meetings concluded at 5:30 PM.

Holbrook District Follow-up Summary by Rick Powers

■ Safety and Infrastructure Concerns

- The Ganado Wash Bridge project includes pedestrian walkways on both sides of the roadway (a 5' sidewalk on the north side and an 8' sidewalk on the south side); construction is scheduled in the spring of 2016. The bridge will also be widened to accommodate a new right turn-lane to the Hubble Trading Post; this will be a separate access from the church.
- The Burnside-Fish Wash project will add 5' shoulders on each side of the roadway and also includes pavement rehabilitation, fence & cattle guard, ACFC, and striping. Construction scheduled for spring of 2016.


End of Stakeholder Summary Report



APPENDIX A: SIGN-IN SHEETS

Name	Position	Agency	Department	Address	City	State	Zip	Phone	Fax	Email	Initial
Don Sneed	Senior Planner/Project Manager	Arizona Department of Transportation	Multimodal Planning Division	206 S. 17th Avenue, MD 310B	Phoenix	AZ	85007	602-712-6736	602-712-6412	dsneed@azdot.gov	DS
Lynn Johnson	District Engineer	Arizona Department of Transportation	Holbrook District	2407 East Navajo Boulevard	Holbrook	AZ	86025	928-524-5404	928-524-5410	LJohnson3@azdot.gov	
Calvin Castillo	Manager/Agency Road Engineer	BIA Navajo Region	Department of Transportation	P.O. Box 7H	Fort Defiance	AZ	86504	928-729-7222 / 7221	928-729-7225	calvin.castillo@bia.gov	
Franklin Sandoval	Road Maintenance Supervisor	BIA Navajo Region	Department of Transportation	P.O. Box 619	Fort Defiance	AZ	86504	928-729-7332 / 7334		frank.sandoval@bia.gov	
Roland Becenti	Supervisor Highway Engineer	BIA Navajo Region	Department of Transportation	P.O. Box 127	Tuba City	AZ	86504	928-283-2298	928-283-2227	roland.becenti@bia.gov	
Romare Truley	Community Planner/Tribal Liaison	Federal Highway Administration	Arizona Division	4000 N. Central Avenue, Suite 1500	Phoenix	AZ	85012	602-382-8978	602-382-8998	Romare.Truely@dot.gov	
Thomas Benally	Principal Engineering Technician	Navajo Division of Transportation	Transportation Planning Department	Navajo Division of Transportation, P.O. Box 4620	Window Rock	AZ	86515	505-371-8314	505-371-8399	tbenally@navajodot.org	
Alton Shepherd	Council Delegate	Navajo Nation Council		P.O. Box 3390	Window Rock	AZ	86515			alton_shepherd@yahoo.com	
Margie Begay	Senior Planner	Navajo Division of Transportation	Transportation Planning Department	Navajo Division of Transportation, P.O. Box 4620	Window Rock	AZ	86515	505-371-8312	505-371-8399	mbegay@navajodot.org	
Ben Bennett	Deputy Director	Navajo Division of Transportation		Navajo Division of Transportation, P.O. Box 4620	Window Rock	AZ	86515	505-371-8350		bbennett@navajodot.org	
Rick Powers, PE		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				
Vamshi Yellisetty		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				PHONE
Srdjan Todorovic		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				

Group 2: 10:30 AM - 11:45 AM

Name	Position	Agency	Department	Address	City	State	Zip	Phone	Fax	Email	Initial
Dominic M. Clichee, M.P.H.	Epidemiologist	Tsehootsooi Medical Center	Division of Healthy Living and Outreach	PO Box 649	Fort Defiance	AZ	86504	928-729-8163		Dominic.clichee@fdihb.org	
Jacey McCurtain	District IPC Specialist	Indian Health Service	Office of Environmental Health & Engineering	P.O. Box 649	Fort Defiance	AZ	86504	928 729-8449	928 729-8459	jacey.mccurtain@ihs.gov	
Peter Keenan	Facility Director	Sage Memorial Hospital Campus		P.O. Box 457	Ganado	AZ	86505	928.380.6068		peter.keenan@sagememorial.com	✓
Trish Dalgai	Chief Operations Officer (ALTERNATE)	Sage Memorial Hospital Campus		P.O. Box 457	Ganado	AZ	86505			netrish.dalgai@razaghihealthcare.com	
Antonio Cook	Sergeant	Navajo Nation Department of Public Safety		P.O. Box 250	Window Rock	AZ	86515	928-871-6116		acooke@citlink.net	
		Ganado Police Sub Station			Ganado	AZ		928-755-3871			
Dewayne Woody	Fire Chief	Ganado Fire District						928-755-3424		dewayne.woodie@ganadofire.org	
Dennis Dedman	Transportation Director	Ganado Unified School District #20	Transportation Security	P.O. Box 1757	Ganado	AZ	86505	928-755-1138		Dennis.Dedman@ganado.k12.az.us	
Wesley Begay	Maintenance Supervisor (ALTERNATE)	Ganado Unified School District #20		P.O. Box 1757	Ganado	AZ	86505			Wesley.Begay@ganado.k12.az.us	
Ramone Yazzie Sr	ASO/OTTA	Navajo Department of Emergency Medical Services	Office of Training & Technical Assistance	P.O. Box Drawer 3360	Window Rock	AZ	86515	928-871-7425		rhyazziesr@navajonnsn.gov	
Antonio Cook	Sergeant	Navajo Department of Public Safety		P.O. Box 250	Window Rock	AZ	86515	928-871-6116		acooke@citlink.net	
John Williams	Lieutenant	Navajo Fire Department		Box 3360	Window Rock	AZ	86515	928-871-6915		smkjumperz@hotmail.com	
Jeff Morgan	Lieutenant	Navajo Fire Department		Box 3360	Window Rock	AZ	86515			jmorgan@navajonnsn.org	
R. Barry Williams	Superintendent	Apache County Schools		PO Box 548	St Johns	AZ	85936	928-337-7539		bwilliams@apachecounty schools.net	
Edison Yazzie	Manager	Ganado Senior Center		PO Box 90	Ganado	AZ	86505	928-755-3754		edison.yazzie@nndoh.org	
Anissa Jonovich	Community Planner	Arizona DHS		150 N. 18th Avenue, Suite 310	Phoenix	AZ	85007	602-542-1879 / 480-662-1542		Anissa.Jonovich@azdhs.gov	
Leslie Dornfield	Owner	Plan -et		10631 North 11th Place	Phoenix	AZ	85020	602-663-2002		leslie@plan-et.us	
Don Sneed	Senior Planner/Project Manager	Arizona Department of Transportation	Multimodal Planning Division	206 S. 17th Avenue, MD 310B	Phoenix	AZ	85007	602-712-6736	602-712-6412	dsneed@azdot.gov	
Rick Powers, PE		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				
Vamshi Yellisetty		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				
Srdjan Todorovic		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				

Name	Position	Agency	Department	Address	City	State	Zip	Phone	Fax	Email	Initial
Leo Watchman	Jr., Department Manager III	Navajo Department of Agriculture		P.O. Box 4889	Window Rock	AZ	86515	928-871-6605	928-871-6679	lwatchman@navajo-nsn.gov	
Ray Castillo	Principal Extension Agent	Navajo Department of Agriculture		P.O. Box 4889	Window Rock	AZ	86515	928-871-6605	928-871-6679	rcastillo_nnda@yahoo.com	
Tennell Nez		Navajo Department of Agriculture		P.O. Box 4889	Window Rock	AZ	86515	928-871-6605	928-871-6679	tennell_mn@yahoo.com	
Anthony Perry	Program Manager	Navajo Nation Project Development	Project Development Department	PO Box 663	Window Rock	AZ	86515	928-871-6504	928-871-6507	tperrynded12@gmail.com	
Beatrice Watchman		Navajo Nation Division of Economic Development	Division of Economic Development	PO Box 663	Window Rock	AZ	86515	928-871-6504	928-871-6507	bwatchman05@gmail.com	
Sharlene Begay-Platero	Industrial Development Representative	Navajo Nation Division of Economic Development	Project Development Department					505-905-6414		srpb@navajoadvantage.com	
		Navajo Nation Division of Community Development									
Andrea Chase/Brian K. Reed	Development Specialist	NHA/DCSD - Planning Department						928-729-6340		archase@hooghan.org	
Dwayne Waseta	Division Director	Navajo Nation Housing Authority						928-729-6624		dwaseta@hooghan.org	
Gertrude Parker	House Director	Navajo Nation Housing Authority						928-729-6360		GParker@hooghan.org	
Victor McGray <i>McGray</i>	<i>PLANNING</i>	Navajo Nation Housing Authority			<i>FT. DEF</i>	<i>AZ</i>	<i>86504</i>	<i>928-729-6380</i>		vmcgray@hooghan.org	<i>[Signature]</i>
Alexious Becenti	Forestry Manager	Navajo Forestry						928-729-4007		acbecenti_nfd@frontiernet.net	
		Moras Conoco Gas Station		HWY 264 & 191	Ganado	AZ	856505				
		Mustang Gas Station		HWY 264 & 191	Ganado	AZ	856505				
		Conoco Gas Station		HWY 264 & 191	Ganado	AZ	856505				
		Burger King		HWY 264 & 191	Ganado	AZ	856505	928-755-6227			
		Hubbell Trading Post Store		PO Box 388	Ganado	AZ	86505	928-755-3254		hubbell@wnpa.org	
Jason Kelly	Transportation/Transit Planning Mobility Manager	Northern Arizona Council of Governments		119 East Aspen Avenue	Flagstaff	AZ	86001	928-774-1895	928-773-1135	jkelly@nacog.org	
Willie Tracey Jr.	Planner	Navajo Transit System		P.O. Drawer 1330	Window Rock	AZ	86515	928-729-4113	928-729-4454	wtracey@navajotransit.com	
Lee Bigwater	Department Manager III	Navajo Transit System		P.O. Drawer 1330	Window Rock	AZ	86515	928-729-4002		lbigwater@navajotransit.com	
Rayni Shebala	Work Management Administrator	Navajo Tribal Utility Authority		P.O. Box 170	Fort Defiance	AZ	86504	928-729-6121		raynis@ntua.com	
Rex P. Kontz	Deputy General Manager	Navajo Tribal Utility Authority		P.O. Box 170	Fort Defiance	AZ	86504			rpkontz@ntua.com	
Daniel Wauneka	FD District Manager	Navajo Tribal Utility Authority		P.O. Box 170	Fort Defiance	AZ	86504			dwauneka@ntua.com	

Laura Sloan	Customer Service	Navajo Tribal Utility Authority		P.O. Box 170	Fort Defiance	AZ	86504			lauras@ntua.com	
Thomas E. Bayles, PE	Senior Civil Engineer	Navajo Tribal Utility Authority		P.O. Box 170	Fort Defiance	AZ	86504			thomasb@ntua.com	
Don Sneed	Senior Planner/Project Manager	Arizona Department of Transportation	Multimodal Planning Division	206 S. 17th Avenue, MD 310B	Phoenix	AZ	85007	602-712-6736	602-712-6412	dsneed@azdot.gov	DS
Rick Powers, PE		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				RP
Vamshi Yellisetty		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				
Srdjan Todorovic		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				ST

Jason Corral Sr. Civil Engineer NTUA

(928) 729-4791

jasonco@ntua.com JC

Name	Position	Agency	Department	Address	City	State	Zip	Phone	Fax	Email	Initial
Ferrin Crosby	County Engineer	Apache County District II	Engineering Department	P.O. Box 238	St. Johns	AZ	85936	928-337-7528	928-337-2062	fcrosby@co.apache.az.us	
Kirk W. Arviso	Administrative Coordinator	Apache County District II	Fort Defiance Administration Office	P.O. Box 1170	Fort Defiance	AZ	86504	928-729-2141	928-729-2147	kirkarviso@co.apache.az.us	✓
Lewis Shirley	Administrative Coordinator/Chapter Liaison	Apache County District II	Fort Defiance Administration Office	P.O. Box 1170	Fort Defiance	AZ	86504	928-729-2141	928-729-2147	lshirley@co.apache.az.us	✓
Tom White	Jr., Supervisor	Apache County District II	Fort Defiance Administration Office	P.O. Box 1170	Fort Defiance	AZ	86504	928-729-2141	928-729-2147	tomjrwhite54@yahoo.com	
Curtis Berry	Operations Manager	Apache County District II	Fort Defiance Administration Office	P.O. Box 1170	Fort Defiance	AZ	86504	928-729-2141	928-729-2147	cberry@co.apache.az.us	
Paula P Claw	District Manager	Apache County District II	Roads	P.O. Box 1170	Fort Defiance	AZ	86504	928-755-3881	928-729-2147	pclaw@co.apache.az.us	
Elizabeth Kuipers	Secretary/Treasurer	Ganado Chapter 3/3/15	Elizabeth H. Kuipers	P.O. Box 188	Ganado	AZ	86505	928-755-5920	928-755-5927	lizkuipers@gmail.com	✓
Evangeline Curley-Thomas	President	Ganado Chapter Farm Board		P.O. Box 188	Ganado	AZ	86505	928-755-5920	928-755-5927	ecthomas@navajo.nsn.gov	
Harry J. Yazzie	Chapter Service Coordinator	Ganado Chapter	Harry J Yazzie 3/3/15	P.O. Box 188	Ganado	AZ	86505	928-755-5920	928-755-5927	hjyazzie2000@yahoo.com	✓
Vince R. James	President	Ganado Chapter		P.O. Box 188	Ganado	AZ	86505	928-755-5920 / 928-313-1954	928-755-5927	vjames312@yahoo.com	✓
Walter Jones	Vice-President	Ganado Chapter		P.O. Box 188	Ganado	AZ	86505	928-755-5920	928-755-5927	wjones_cvs@yahoo.com	
		Ganado Chapter Planning Committee		P.O. Box 188	Ganado	AZ	86505	928-755-5920	928-755-5927		
Don Sneed	Senior Planner/Project Manager	Arizona Department of Transportation	Multimodal Planning Division	206 S. 17th Avenue, MD 310B	Phoenix	AZ	85007	602-712-6736	602-712-6412	dsneed@azdot.gov	DS
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Vamshi Yellisetty		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				
Srdjan Todorovic		Jacobs Engineering		101 N 1st Avenue, Suite 2600	Phoenix	AZ	85003				ST

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Lenora Shirley Ganado CHR AN Division of Health CHR Box 118 Ganado, AZ 86505 Ganado AZ 86505 928-755-5920 928-755-5927 lenora.shirley@ndoh.org

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Sarah J. Nuhn Ganado Senior Center Adm Box 438 Ganado 86505 (928) 755-3759

Ruby Leno

Chensh Seaton CNA GALC - AWLI. Nursing P.O. Box 599 Ganado 86505 (928) 755-3807

Priscilla George Arnie Wauwaka Life Care Inc. Nursing P.O. Box 599 Ganado 86505 (928) 755-3807

JACKSON GORMAN DRIVER Senior Center Canada (928) 755-3754
Ruby Lam DSS/AIHCOP 928.755.5930
ISABEL STONDEE Comm Membr 928-755-2257 GANADO

Names

Stakeholder s

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Steven1003@yahoo.com

Kin Dah Lichii School



GANADO CHAPTER

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Telephone: 928-755-5920

Fax: 928-755-5927

Vince R. James
President

Walter Jones
Vice-President

Elizabeth H. Kuipers
Secretary/Treasurer

Alton Shepherd
Council Delegate

Dickerson Smith
Grazing Officer

Harry J. Yazzie
Coordinator

AGENDA GANADO CHAPTER PLANNING MEETING March 03, 2015, 3:00 P.M.

RECEIVED
GANADO CHAPTER

MAR 02 2015

BY: _____

- I. CALL MEETING TO ORDER
- II. INVOCATION
- III. SCHEDULE OF EVENTS AND ANNOUNCEMENTS
 - A. March 03, 2015, 8-5 pm, Ganado-Burnside Area Traffic Circulation Study Stakeholder Meeting
 - B. March 03, 2015, 3:00 pm, Ganado Chapter Planning Meeting
 - C. March 03, 2015, 10:00 am, Food Handler Training Class
 - D. March 05, 2015, 4:30 pm, Ganado Veterans Organization Meeting
 - E. March 08, 2015, 1:00 pm, Ganado Regular Chapter Meeting
 - F. March 11, 2015, 8:30 am, Regional Chapters Networking/Strategic Meeting, Honorable Alton Shepherd
 - G. March 12, 2015, 9:00 am, Fort Defiance Agency Veteran Organization Meeting
 - H. March 23, 2015, 9:00 am, Child Fatality Meeting, Social Services
 - I. March 24, 2015, 10:00 am, Food Distribution
- IV. APPROVAL OF AGENDA
- V. APPROVAL OF FEBRUARY 12, 2015, REGULAR CHAPTER MEETING MINUTES
- VI. APPROVAL OF FINANCIAL STATEMENTS FOR THE MONTH ENDED FEBRUARY 28, 2015
- VII. OLD BUSINESS
 - A. Requesting, Recommendation and Endorsing Resolution to Appoint Steven Kee and Teresa Showa to the Little Colorado River Watershed Chapters Association as Representative(s) of Ganado Chapter.
 - B. Supporting Request of Wide Ruins Community School, Inc., for its Reauthorization to Continue Operation as Grant Program Under the Tribally Controlled School Act, Public Law 100-297, Beginning July 01, 2015 through June 30, 2018.
 - C. Supporting Resolution for Intergovernmental Agreement (IGA) with Apache County to Establish Road to Resident of Tom Todacheenie at Tselani area.
- VIII. NEW BUSINESS
 - A. Supporting Resolution to Install Telecommunication Tower – Burnside Junction, NTUA.

IX. REPORTS

- A. Alton Shepherd, Honorable Council Delegate
- B. Harry J. Yazzie, CSC
- C. Dickerson Smith, Grazing Representative
- D. Teresa Gorman, Community Land Use Planning Committee
- E. Lenora Shirley, CHR
- F. Allan Blacksheep, Jr., Ganado Unified School District Board President
- G. Jackson Gorman, Ganado Senior Center

X. ADJOURNMENT



STAKEHOLDER QUESTIONNAIRE



NAME (OPTIONAL): _____

AGENCY: _____

Transportation Challenges/Issues

Please identify existing issues and future needs within the Ganado/Burnside study area. If necessary, please use the map on the back page to highlight areas you feel need improvement.

Safety and Infrastructure Concerns

Examples: High accident locations, unsafe roadways and intersections, unsafe speed locations, sight distance issues, drainage, signage and lighting, poor pavement conditions, bridges/culverts conditions, unpaved roadways, poor emergency response times

Congestion and Mobility Conditions

Examples: Congested roads, congestion at intersections, time of congestion, heavy truck traffic, alternative routes

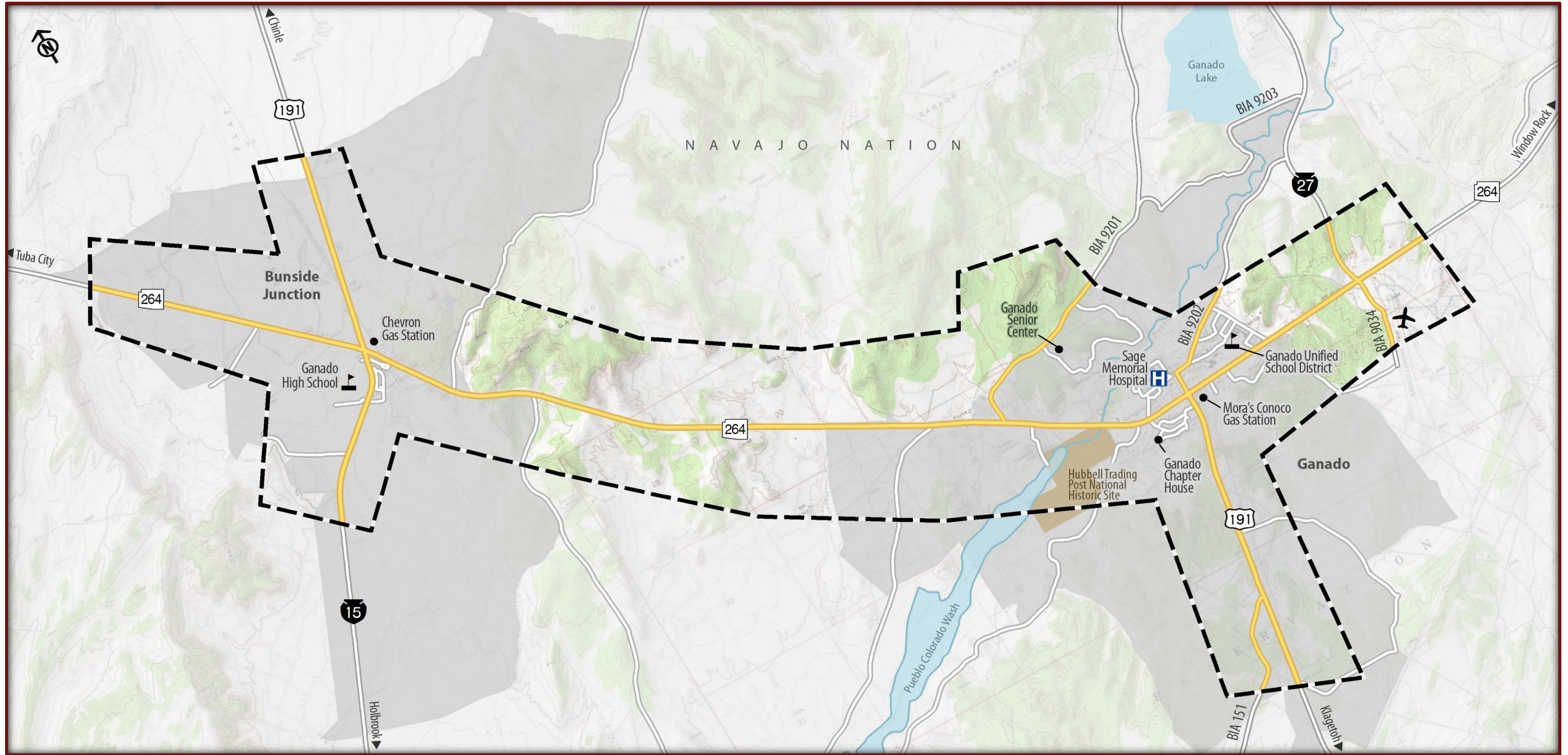
Pedestrian, Bicycle, Transit

Examples: Pedestrian crossings, sidewalks, pedestrian sidewalks on bridges, bicycle lanes, trails, signage, public transit, transit routes, bus stops/pullouts

Future Conditions, Transportation Issues and Needs

Examples: Please identify on the map any planned residential, commercial, or industrial developments. Please comment on - the type of growth you would like to see, potential transportation issues as growth occurs, potential partnership opportunities

Please mark-up map with issues you feel are in need of improvement.



Additional Comments _____

Please submit comment forms to the project team at the end of the meeting or mail/email forms by Friday, March 20, 2015 to:

Kirk Arviso

Apache County District II
Mail: Fort Defiance Administration Office
P.O. Box 1170
Fort Defiance, AZ 85004
Email: kirkarviso@co.apache.az.us

- OR -

Don Sneed

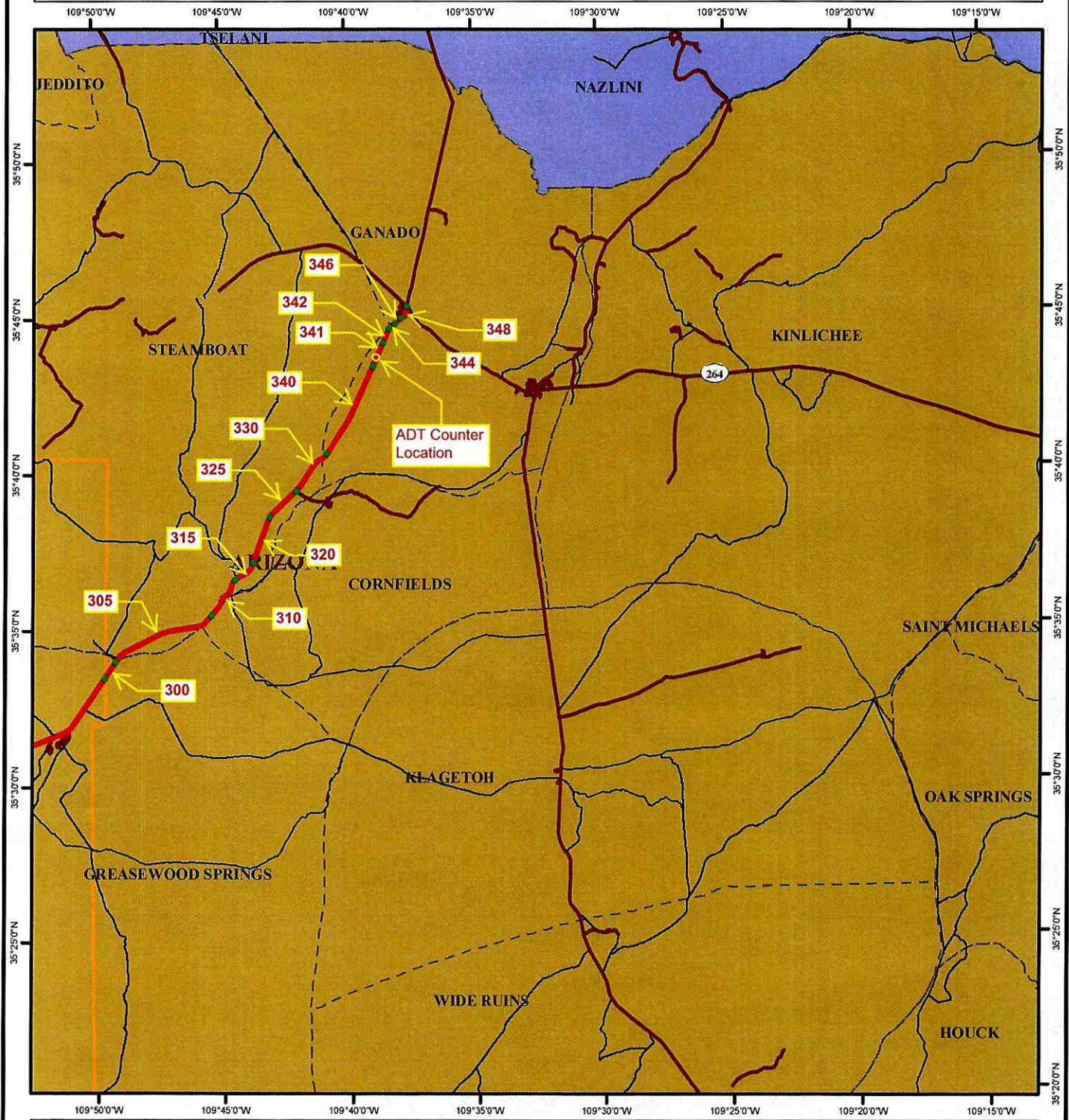
Arizona Department of Transportation
Mail: ADOT MPD
206 South 17th Avenue, MD 310B
Phoenix, AZ 85007
Email: dsneed@azdot.gov

APPENDIX B. NTTFI INVENTORY





ROUTE 0015 STRIP MAP SECTIONS 300 - 348 FORT DEFIANCE



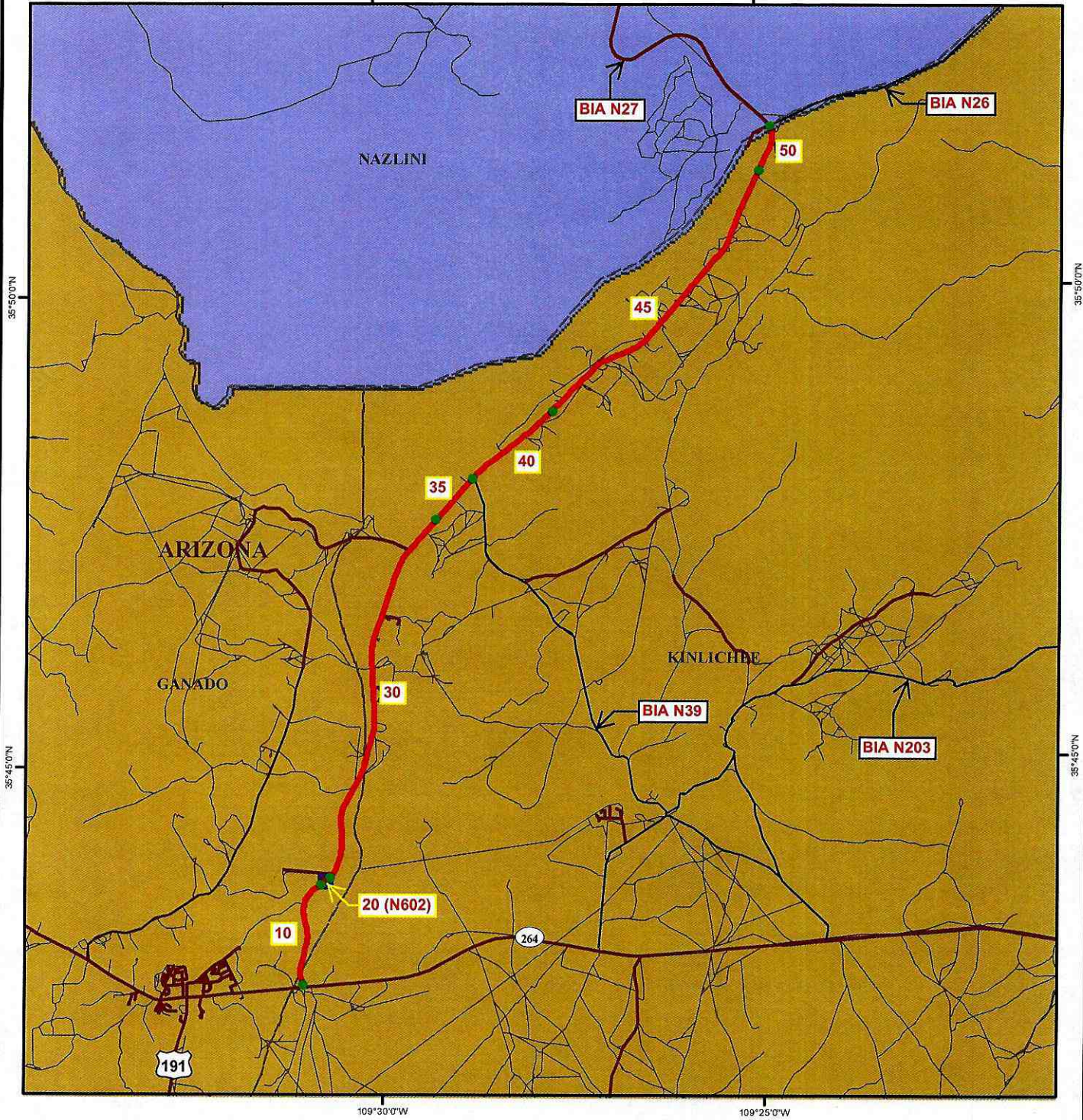
Legend		Agency		Length of Route Shown: 18.4 miles Ownership: State Date: 05/16/2007 0 4 Miles
Selected Route Limited Access Highway Paved Road BIA Road Other Road or Trail	Interstate Highway State Highway County Road Bridges Latitude/Longitude Grid	32 - Shiprock 33 - Western 34 - Eastern 35 - Chinle 36 - Fort Defiance	NIP New Lands State Boundary County Boundary Chapter Boundary	



ROUTE 0027 STRIP MAP SECTIONS 10 - 50 FORT DEFIANCE

109°30'0"W

109°25'0"W



109°30'0"W

109°25'0"W

Legend

- | | | | |
|------------------------|-------------------------|--------------------|------------------|
| Selected Route | Interstate Highway | Agency | 32 - Shiprock |
| Limited Access Highway | State Highway | 33 - Western | NIIP |
| Paved Road | County Road | 34 - Eastern | New Lands |
| BIA Road | Bridges | 35 - Chinle | State Boundary |
| Other Road or Trail | Latitude/Longitude Grid | 36 - Fort Defiance | County Boundary |
| | | | Chapter Boundary |

Length of Sections Shown

12.7 miles

Ownership: BIA

Date: 5/31/2007





Indian Reservation Roads Program Inventory Data Sheet (ver2)

FY 2015 Inventory

Filter Criteria

N 2015 36 780 0027

Italicized fields are direct update data
and bold fields are derived data.

For construction costs use
the Greenbook Report

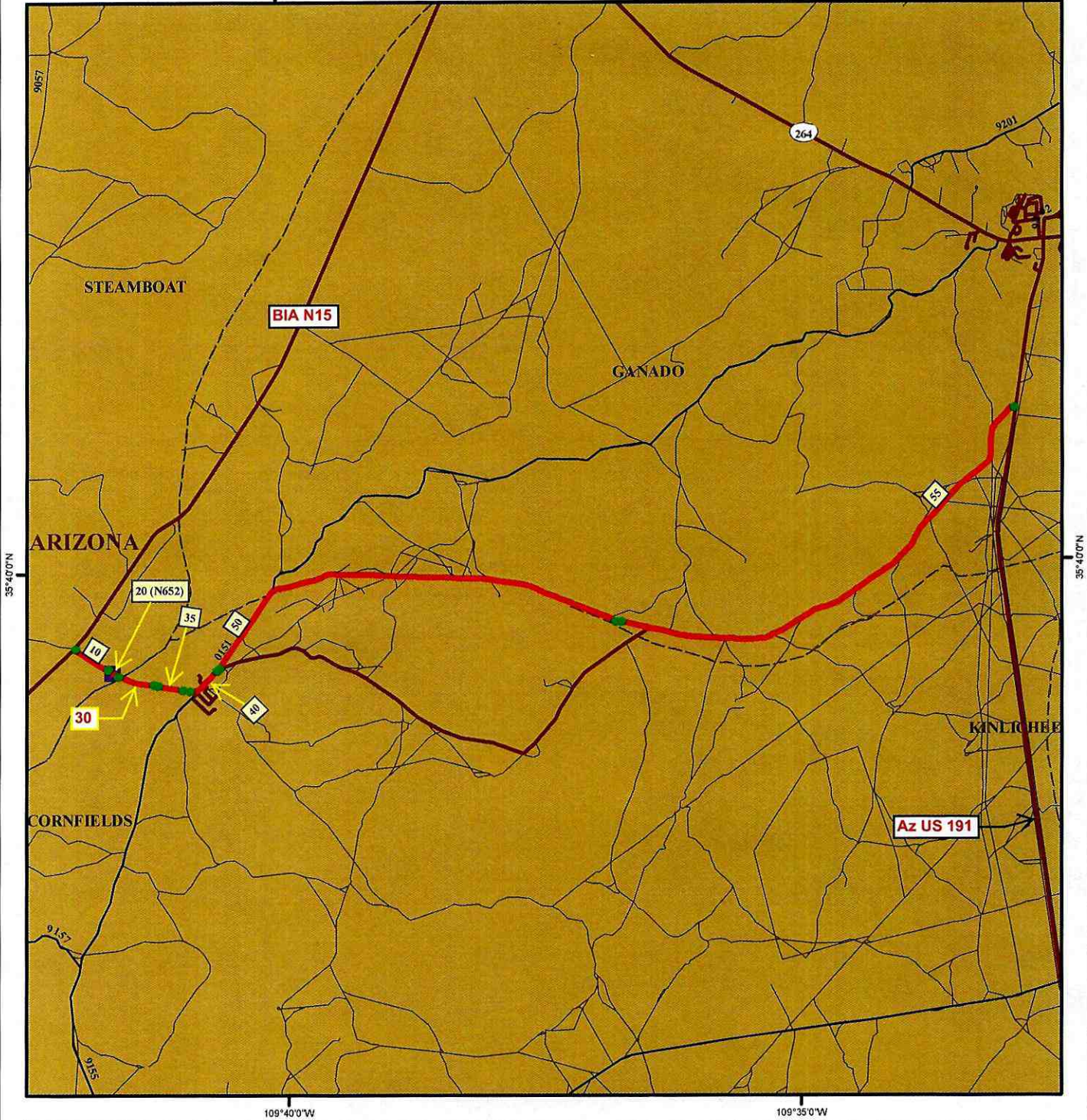
Location ID Region Agency Reservation Road Name	N36780 Navajo Fort Def Navajo () Bia Rout 0027	N36780 Navajo Fort Def Navajo () Bia Rout 0027	N36780 Navajo Fort Def Navajo () Bia Rout 0027	N36780 Navajo Fort Def Navajo () Bia Rout 0027	N36780 Navajo Fort Def Navajo () Bia Rout 0027	N36780 Navajo Fort Def Navajo () Bia Rout 0027	N36780 Navajo Fort Def Navajo () Bia Rout 0027	N36780 Navajo Fort Def Navajo () Bia Rout 0027	N36780 Navajo Fort Def Navajo () Bia Rout 0027	Status
4-IRR Route Number	10	10	10	20	30	40	50	50	50	OFFICIAL
5-Section Number	2	2	2	2	2	2	2	2	2	OFFICIAL
10-Class	1.4	1.4	1.4	9	4.9	1.3	0.6	0.6	0.6	OFFICIAL
15-Length of Section				N602						OFFICIAL
18-Bridge Number				200						OFFICIAL
19-Bridge Condition				001						OFFICIAL
20-Bridge Length				01						OFFICIAL
32-County				AZ						OFFICIAL
33-Congressional District				AZ						OFFICIAL
7-State				1						OFFICIAL
8-Ownership				1						OFFICIAL
12-Construction Need				1						OFFICIAL
11-Terrain				2						OFFICIAL
25-Roadbed Condition				2						OFFICIAL
24-Surface Condition Index				4						OFFICIAL
16-Surface Width				50						OFFICIAL
13-Surface Type				22						OFFICIAL
9-Federal Aid Category				5						OFFICIAL
28-Right of Way Status				1						OFFICIAL
29-Right of Way Width				3						OFFICIAL
TTAM BIA Share				200						OFFICIAL
30-Additional Incidental Percent				100						OFFICIAL
17-Shoulder Width				4						OFFICIAL
14-Shoulder Type				3						OFFICIAL
22-Existing ADT				684						OFFICIAL
21-ADT Year				2000						OFFICIAL
23-Percent Trucks				10						OFFICIAL
34-Owner Route Number				36428						OFFICIAL
Roadway Width				30						OFFICIAL
TTAMI Future ADT				1102						OFFICIAL
TTAM ADS Number				5						OFFICIAL
TTAMI Future Surface Type				P						OFFICIAL
35-Drainage Condition				2						OFFICIAL
36-Shoulder Condition				1						OFFICIAL
37/38 # RR X I NG/RR XING TYPE										OFFICIAL
39-Right of Way Utility				3						OFFICIAL
40-Right of Way Cost				0						OFFICIAL
26-Level of Maintenance				2						OFFICIAL
27-Snow & Ice Control				3						OFFICIAL
41-Begin Latitude										OFFICIAL
42-End Latitude										OFFICIAL
43-Begin Longitude										OFFICIAL
44-End Longitude										OFFICIAL
45-Atlas Map Number [99]				27						OFFICIAL
46-50 Grade/Sight/Curve/Stop / Sai				7						OFFICIAL
51-Road Category				5						OFFICIAL
52-Year of Construction Change				1995						OFFICIAL
Update Year				2012						OFFICIAL



ROUTE 0151 STRIP MAP SECTIONS 10 - 55 FORT DEFIANCE

109°40'0"W

109°35'0"W



Legend

- Selected Route
- Limited Access Highway
- Paved Road
- BIA Road
- Other Road or Trail

- Interstate Highway
- State Highway
- County Road
- Bridges
- Latitude/Longitude Grid

Agency

- 32 - Shiprock
- 33 - Western
- 34 - Eastern
- 35 - Chinle
- 36 - Fort Defiance

- NIP
- New Lands
- State Boundary
- County Boundary
- Chapter Boundary

Length of Sections Shown

10.3 miles

Ownership: BIA

Date: 05/30/2007

0 0.8

Miles





Indian Reservation Roads Program Inventory Data Sheet (ver2)

FY 2015 Inventory

Filter Criteria				
N	2015	36	780	0151

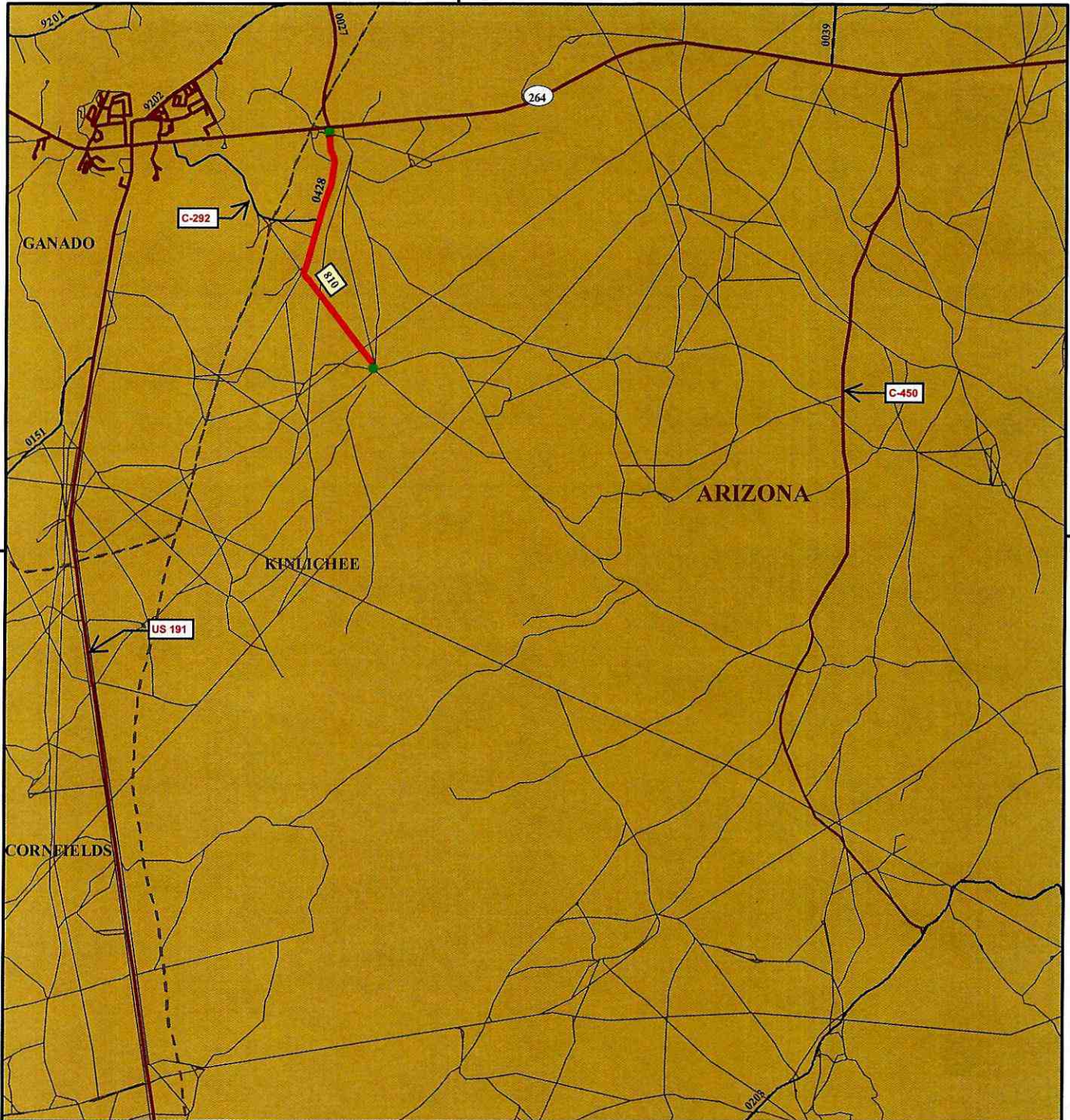
For construction costs use the Greenbook Report
 Italicized fields are direct update data and bold fields are derived data.

Location ID Region Agency Reservation Road Name	N36780 Navajo Fort Def Navajo (Bia Rout 0151	N36780 Navajo Fort Def Navajo (Bia Rout 0151	N36780 Navajo Fort Def Navajo (Bia Rout 0151	N36780 Navajo Fort Def Navajo (Bia Rout 0151	N36780 Navajo Fort Def Navajo (Bia Rout 0151	N36780 Navajo Fort Def Navajo (Bia Rout 0151
4-IRR Route Number	10	4	4	4	4	4
5-Section Number	0.4	0.4	0.4	0.3	0.3	4.2
10-Class	001	001	001	001	001	001
15-Length of Section	01	01	01	01	01	01
18-Bridge Number	AZ	AZ	AZ	AZ	AZ	AZ
19-Bridge Condition	1	1	1	1	1	1
20-Bridge Length	1	1	1	1	1	1
32-County	4	4	4	4	4	4
33-Congressional District	17	17	17	17	17	2
7-State	24	24	24	24	24	20
8-Ownership	4	4	4	4	4	1
12-Construction Need	1	1	1	1	1	1
11-Terrain	3	3	3	3	3	0
25-Roadbed Condition	200	200	200	100	100	0
24-Surface Condition Index	100	100	100	100	100	100
16-Surface Width	1	1	1	1	1	0
13-Surface Type	3	3	3	3	3	2
9-Federal Aid Category	545	545	545	326	326	326
28-Right of Way Status	2000	2000	2000	2000	2000	2000
29-Right of Way Width	36482	36482	36482	36482	36482	36240
TTAM BIA Share	26	26	26	26	26	20
30-Additional Incidental Percent	809	809	809	484	484	484
17-Shoulder Width	10	10	10	10	10	11
14-Shoulder Type	P	P	P	P	P	P
22-Existing ADT	2	2	2	2	2	2
21-ADT Year	2	2	2	2	2	0
23-Percent Trucks	3	3	3	3	3	0
34-Owner Route Number	0	0	0	0	0	0
Roadway Width	36482	36482	36482	36482	36482	36240
TTAM Future ADT	26	26	26	26	26	20
TTAM ADS Number	809	809	809	484	484	484
TTAM Future Surface Type	10	10	10	10	10	11
35-Drainage Condition	P	P	P	P	P	P
36-Shoulder Condition	2	2	2	2	2	2
37/38 # RR X I NG/RR XING TYPE	2	2	2	2	2	0
39-Right of Way Utility	3	3	3	3	3	0
40-Right of Way Cost	0	0	0	0	0	0
26-Level of Maintenance	2	2	2	2	2	2
27-Snow & Ice Control	2	2	2	2	2	2
41-Begin Latitude						
42-End Latitude						
43-Begin Longitude						
44-End Longitude						
45-Atlas Map Number [99]	27	27	27	27	27	27
46-50 Grade/Sight/Curve/Stop / Sai	7	5	0	0	7	3
51-Road Category	0	0	0	0	0	2
52-Year of Construction Change	A	A	A	A	A	6
Update Year	1987	1987	1987	1987	1987	7
Status	2012	2012	2012	2012	2012	2012
	OFFICIAL	OFFICIAL	OFFICIAL	OFFICIAL	OFFICIAL	OFFICIAL



ROUTE 0428 STRIP MAP SECTION 810 FORT DEFIANCE

109°30'0"W



109°30'0"W

Legend

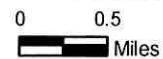
- | | | | |
|------------------------|-------------------------|--------------------|------------------|
| Selected Route | Interstate Highway | Agency | NIIP |
| Limited Access Highway | State Highway | 32 - Shiprock | New Lands |
| Paved Road | County Road | 33 - Western | State Boundary |
| BIA Road | Bridges | 34 - Eastern | County Boundary |
| Other Road or Trail | Latitude/Longitude Grid | 35 - Chinle | Chapter Boundary |
| | | 36 - Fort Defiance | |

Length of Section Shown

1.9 miles

Ownership: Tribe

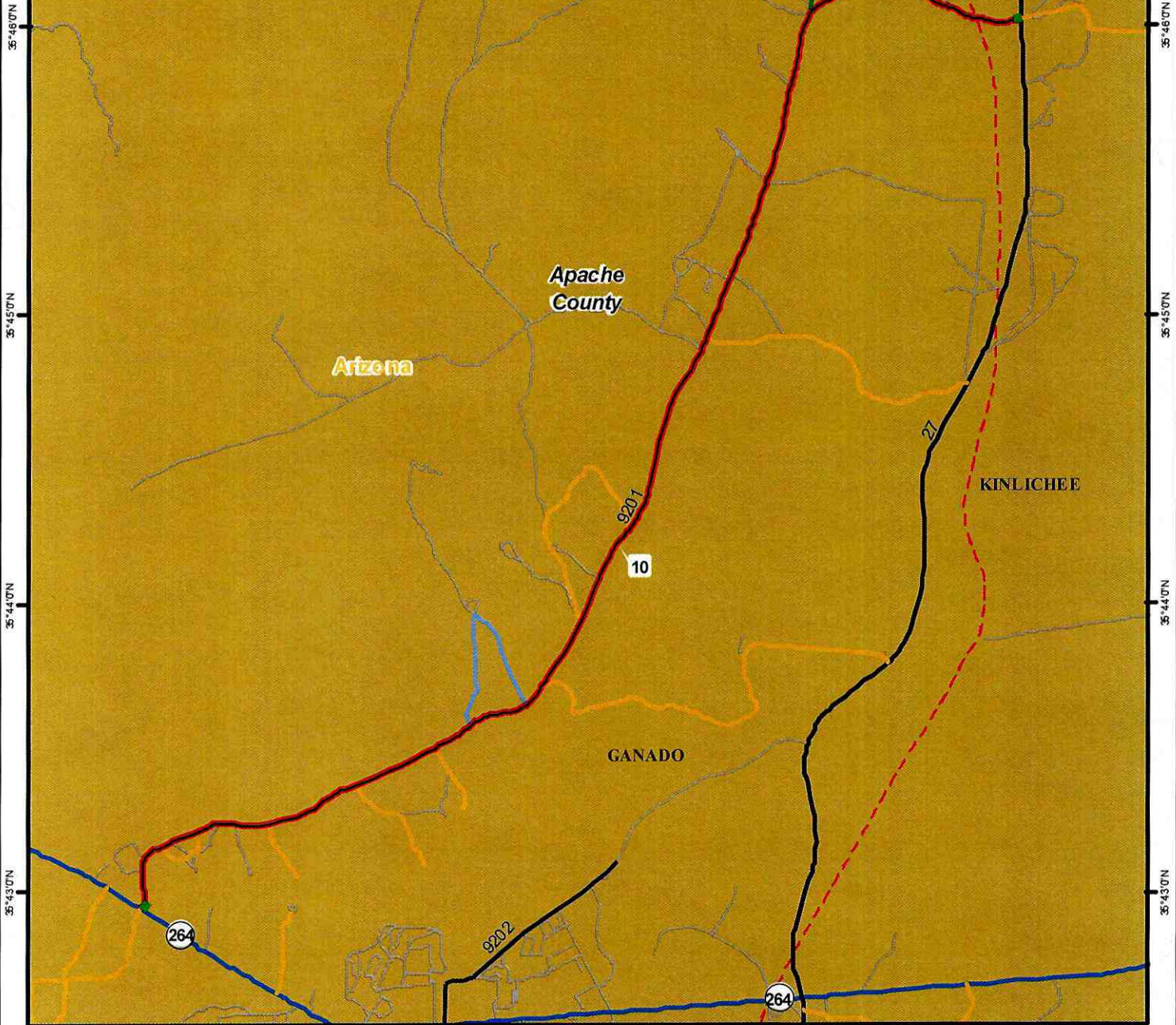
Date: 6/18/2014





ROUTE 9201 STRIP MAP SECTIONS 10 - 10

109°34'0"W 109°33'0"W 109°32'0"W 109°31'0"W 109°30'0"W



Sections	2008 Roads Inventory	Reservation Line
2012 Proposed Routes	BIA Roads	State Boundary
2011 Proposed Routes	US Highways	Chapter
2010 Inventory	Interstates	County Boundary
2009 Inventory	County Roads	NIIP
Agency	Newlands	

Route 9201 Sections 10 - 10
 Length: 5.8 miles
 Ownership: BIA
 Date: 3/11/2012
 0 0.4
 Miles





Indian Reservation Roads Program Inventory Data Sheet (ver2)

FY 2015 Inventory

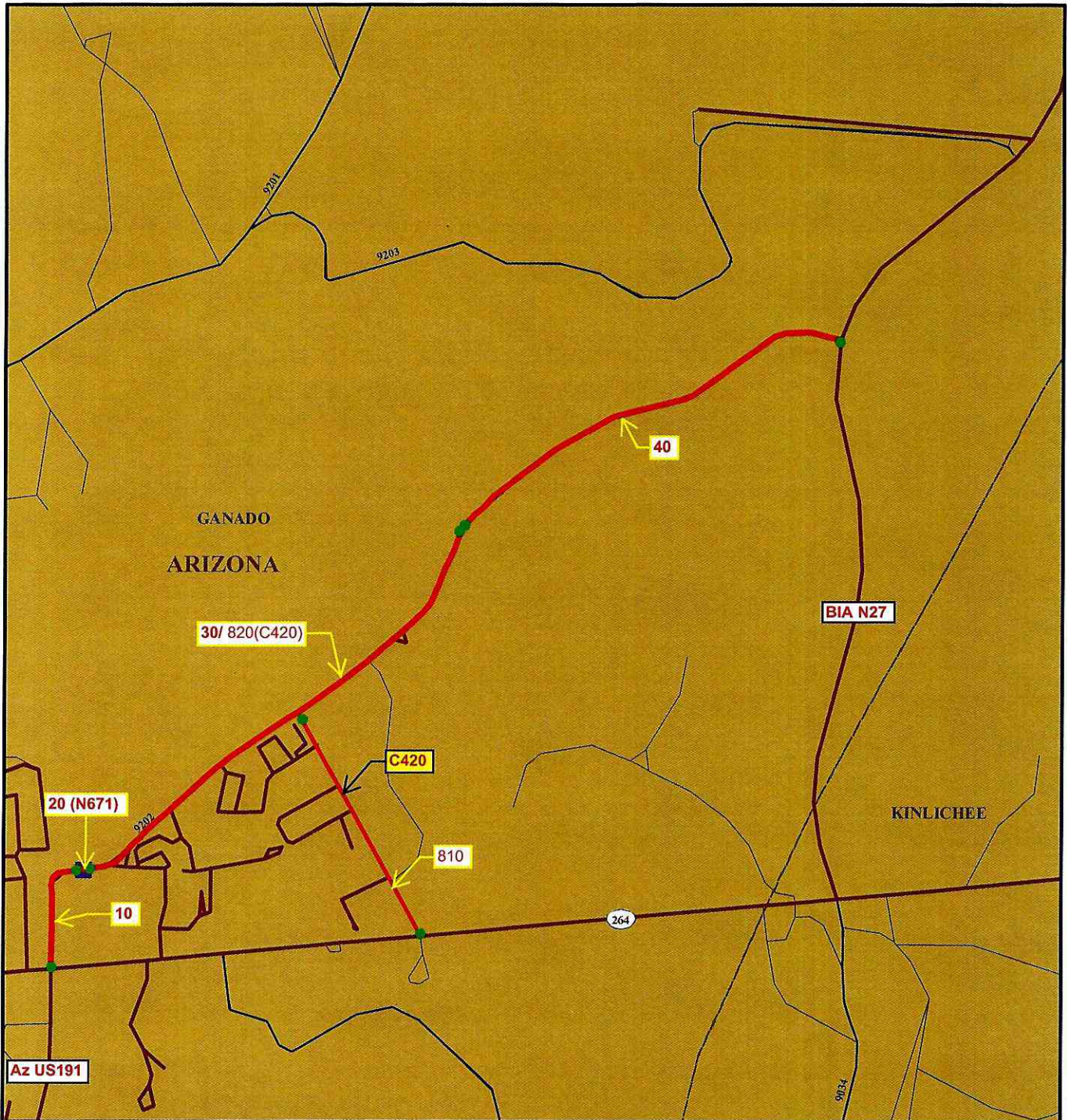
Filter Criteria				
N	2015	36	780	9201

For construction costs use the Greenbook Report
Italicized fields are direct update data and bold fields are derived data.

Location ID	N36780
Region	Navajo
Agency	Fort Def
Reservation	Navajo (
Road Name	Bia Rout
	9201
4-IRR Route Number	10
5-Section Number	4
10-Class	5.8
15-Length of Section	
18-Bridge Number	
19-Bridge Condition	
20-Bridge Length	
32-County	001
33-Congressional District	01
7-State	AZ
8-Ownership	1
12-Construction Need	1
11-Terrain	2
25-Roadbed Condition	2
24-Surface Condition Index	0
16-Surface Width	18
13-Surface Type	1
9-Federal Aid Category	1
28-Right of Way Status	0
29-Right of Way Width	0
TTAM BIA Share	100
30-Additional Incidental Percent	0
17-Shoulder Width	174
14-Shoulder Type	2001
22-Existing ADT	0
21-ADT Year	0
23-Percent Trucks	0
34-Owner Route Number	18
Roadway Width	258
TTAM Future ADT	11
TTAM ADS Number	P
TTAM Future Surface Type	1
35-Drainage Condition	0
36-Shoulder Condition	0
37/38 # RR X I N G / R R X I N G TYPE	3
39-Right of Way Utility	0
40-Right of Way Cost	2
26-Level of Maintenance	2
27-Snow & Ice Control	
41-Begin Latitude	
42-End Latitude	
43-Begin Longitude	
44-End Longitude	
45-Atlas Map Number [99]	27
46-50 Grade/Sight/Curve/Stop / Sai	3 2 10 10 7
51-Road Category	A
52-Year of Construction Change	
Update Year	2007
Status	OFFICIAL



ROUTE 9202 STRIP MAP SECTIONS 10 - 40 FORT DEFIANCE



Legend

- | | | | |
|------------------------|-------------------------|--------------------|------------------|
| Selected Route | Interstate Highway | Agency | NIIP |
| Limited Access Highway | State Highway | 32 - Shiprock | New Lands |
| Paved Road | County Road | 33 - Western | State Boundary |
| BIA Road | Bridges | 34 - Eastern | County Boundary |
| Other Road or Trail | Latitude/Longitude Grid | 35 - Chinle | Chapter Boundary |
| | | 36 - Fort Defiance | |

Length of Sections Shown

2.3 miles

Ownership: BIA

Date: 05/30/2007

0 0.18

Miles





Indian Reservation Roads Program Inventory Data Sheet (ver2)

FY 2015 Inventory

Filter Criteria				
N	2015	36	780	9202

Italicized fields are direct update data
and bold fields are derived data.

For construction costs use
the Greenbook Report

Location ID Region Agency Reservation Road Name	10-IRR Route Number	10-Class	15-Length of Section	18-Bridge Number	19-Bridge Condition	20-Bridge Length	32-County	33-Congressional District	7-State	8-Ownership	12-Construction Need	11-Terrain	25-Roadbed Condition	24-Surface Condition Index	16-Surface Width	13-Surface Type	9-Federal Aid Category	28-Right of Way Status	29-Right of Way Width	TTAM BIA Share	30-Additional Incidental Percent	17-Shoulder Width	14-Shoulder Type	22-Existing ADT	21-ADT Year	23-Percent Trucks	34-Owner Route Number	Roadway Width	TTAM Future ADT	TTAM ADS Number	TTAM Future Surface Type	35-Drainage Condition	36-Shoulder Condition	37/38 # RR X I NG/RR XING TYPE	39-Right of Way Utility	40-Right of Way Cost	26-Level of Maintenance	27-Snow & Ice Control	41-Begin Latitude	42-End Latitude	43-Begin Longitude	44-End Longitude	45-Atlas Map Number [99]	46-50 Grade/Sight/Curve/Stop / Sai	51-Road Category	52-Year of Construction Change	Update Year	Status
N36780 Navajo Fort Def Navajo (10	4	0.3																	100		2	3	1695	1998	5	36298	28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (20	4																		100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (20	4																		100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (20	4																		100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (30	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007	OFFICIAL	
N36780 Navajo Fort Def Navajo (40	4	1.0																	100		2	3	1695	1998	5		28	2517	10	P	2	2	3	0	2	2					27	7 5 0 0 0	A	1990	2007		