GALLUP AREA TRANSPORTATION SAFETY PLAN

491

40

118

610

564

602

FINAL REPORT July 19, 2019

WILSON & COMPANY

CITY OF GALLUP

NMDOT

ACKNOWLEDGEMENTS

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1 Introduction

The New Mexico Department of Transportation (NMDOT) works diligently to reduce fatality and incapacitating (serious) injuries on all roadways in New Mexico. To effectively accomplish this goal, many partners must work together to report and analyze the crash data to first understand the problem locations and then take the next steps to invest in and implement the strategies to address the roadway safety issues. In reviewing the crash data throughout New Mexico, NMDOT and its partners identified the Gallup area as critical for further study and identification of strategies to improve roadway safety for all users.

1.1 Purpose of the Plan

The City of Gallup, NMDOT, and other stakeholders (identified in section 4.1) worked together to develop the Gallup Area Transportation Safety Plan (the Safety Plan) to improve transportation safety in Gallup for vehicles, pedestrians, and bicyclists. The project team, consisting of the NMDOT Statewide Planning Bureau and consultants Wilson & Company, led development of the Plan.

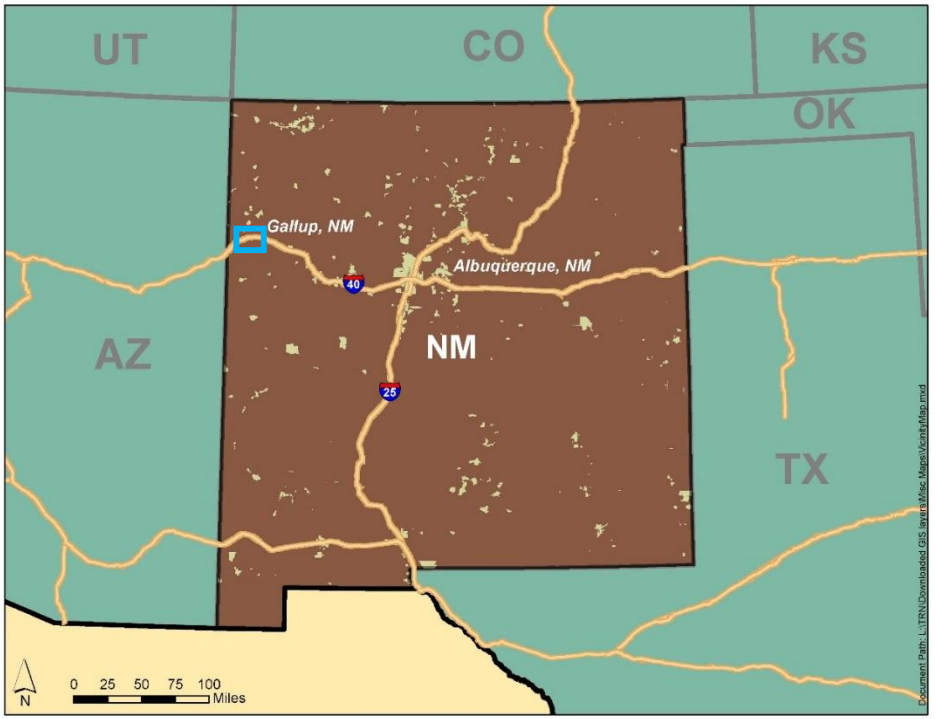


Figure 1 | Gallup Area Vicinity Map

The Safety Plan recommends crash reduction strategies and safety improvements for roadways in the Gallup area (Figure 1). The stakeholder committee developed these recommendations after a comprehensive examination of safety performance of roadways using the most recent crash data available.

The vision of the plan is to make the Gallup area a safer place for residents and visitors to walk, ride a bicycle, and/or drive.

Goals of the plan include:

- Reduce the potential for fatal and serious injury crashes within the Gallup area (vehicle/vehicle, vehicle/pedestrian, and vehicle/bicycle crashes).
- Enhance the common understanding of the need for roadway safety improvements in Gallup.
- Partner with safety practitioners within and outside of the Gallup community to enhance roadway safety.
- Evaluate opportunities to enhance roadway safety with all infrastructure projects.

1.2 Study Area

The study area for this transportation safety plan generally encompasses the area within Gallup's city limit boundary, with additional areas included along I-40 and Route 66/NM 118, Maloney Avenue/NM 609, and US 491 (Figure 2). In order to investigate safety concerns, the study area boundary included locations where there have been significant fatal and serious injury crashes recorded, including interchange areas that serve Gallup but are located outside of the city limits. This study uses 2012–2016 crash data.

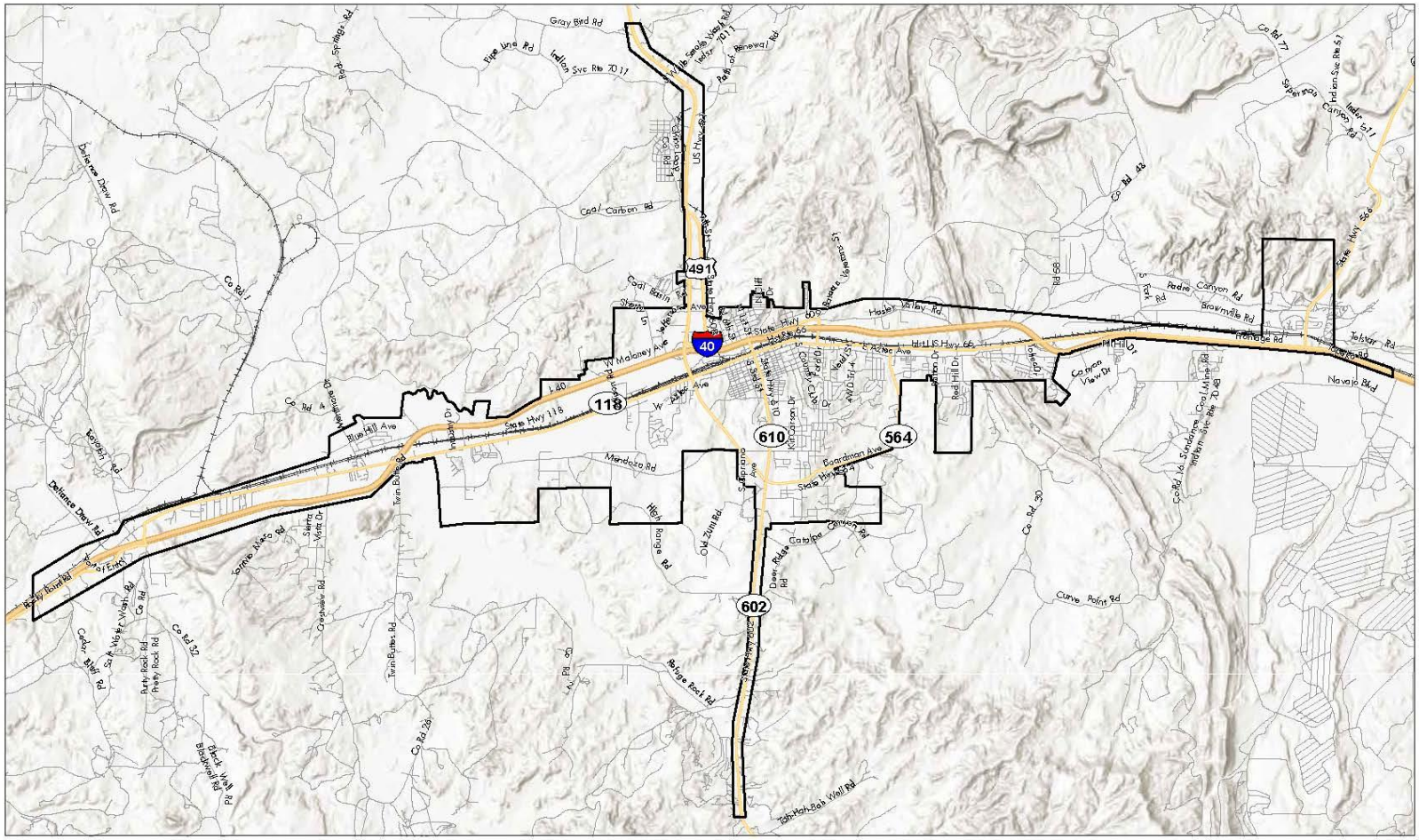


Figure 2 | Gallup Study Area

2 Existing Conditions Assessment

This chapter examines the existing conditions relating to mobility, socioeconomics, and transportation system data to establish a framework understanding of the Safety Plan's study area.

2.1 Demographic and Socioeconomic Profile

2.1.1 Population

The City of Gallup has an estimated total population of 22,063 residents. Figure 3 displays the distribution of these residents by age. There are a large number of young persons within Gallup. At 29.5 years, Gallup has a lower median age compared with the rest of McKinley County and the State of New Mexico, which have median ages of 31.6 and 37.3 years, respectively (Table 1).

Table 1 | Population Statistics by Geography

SEX AND AGE	New Mexico		McKinley County, NM		City of Gallup, NM	
	Estimate	Percent	Estimate	Percent	Estimate	Percent
Total population	2,084,828	100.0%	72,849	100.00%	22,063	100.00%
Male	1,032,086	49.5%	35,209	48.30%	10,538	47.80%
Female	1,052,742	50.5%	37,640	51.7%	11,525	52.20%
Median age (years)	37.3	(X)	31.6	(X)	29.5	(X)
Total housing units	927,790		26,163		8,339	

Source: U.S Census Bureau, "American Fact Finder", generated December 2018, using 2013-2017 American Community Survey data (ACS), http://factfinder.census.gov (accessed December 12, 2018).

Figure 4 displays the distribution of population throughout the Gallup area. Block groups and neighborhoods just to the south of Route 66/NM 118 have the highest population density in Gallup.

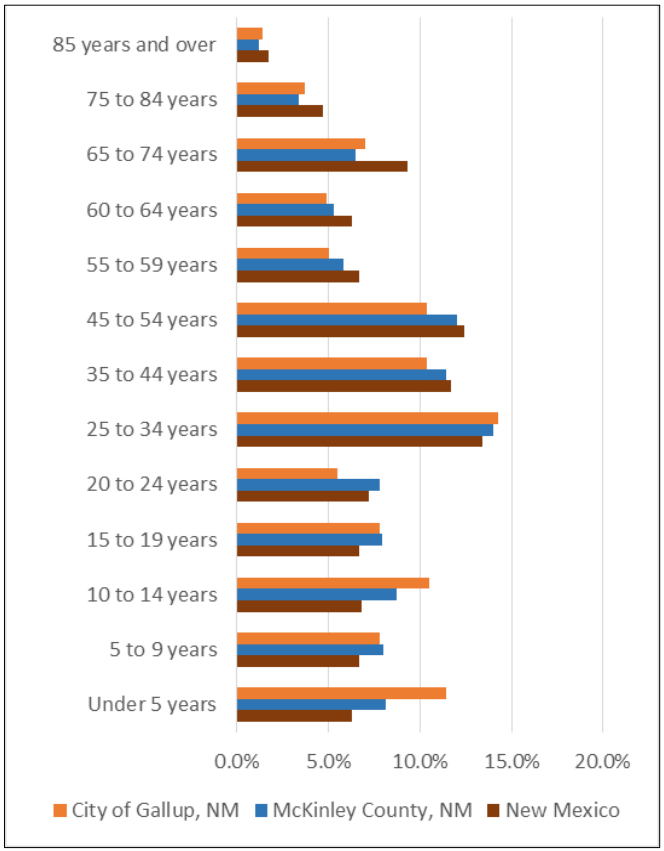


Figure 3 | Age Distribution by Geography

2.1.2 Housing

There are an estimated 8,339 housing units in Gallup (Table 1). With a population of 22,063, there are approximately 2.65 people per housing unit in Gallup. This compares with a person per unit ratio of 2.78 in the County and 2.25 in the State. Much of the housing in Gallup is detached single-family units, with a limited number of multi-family units.

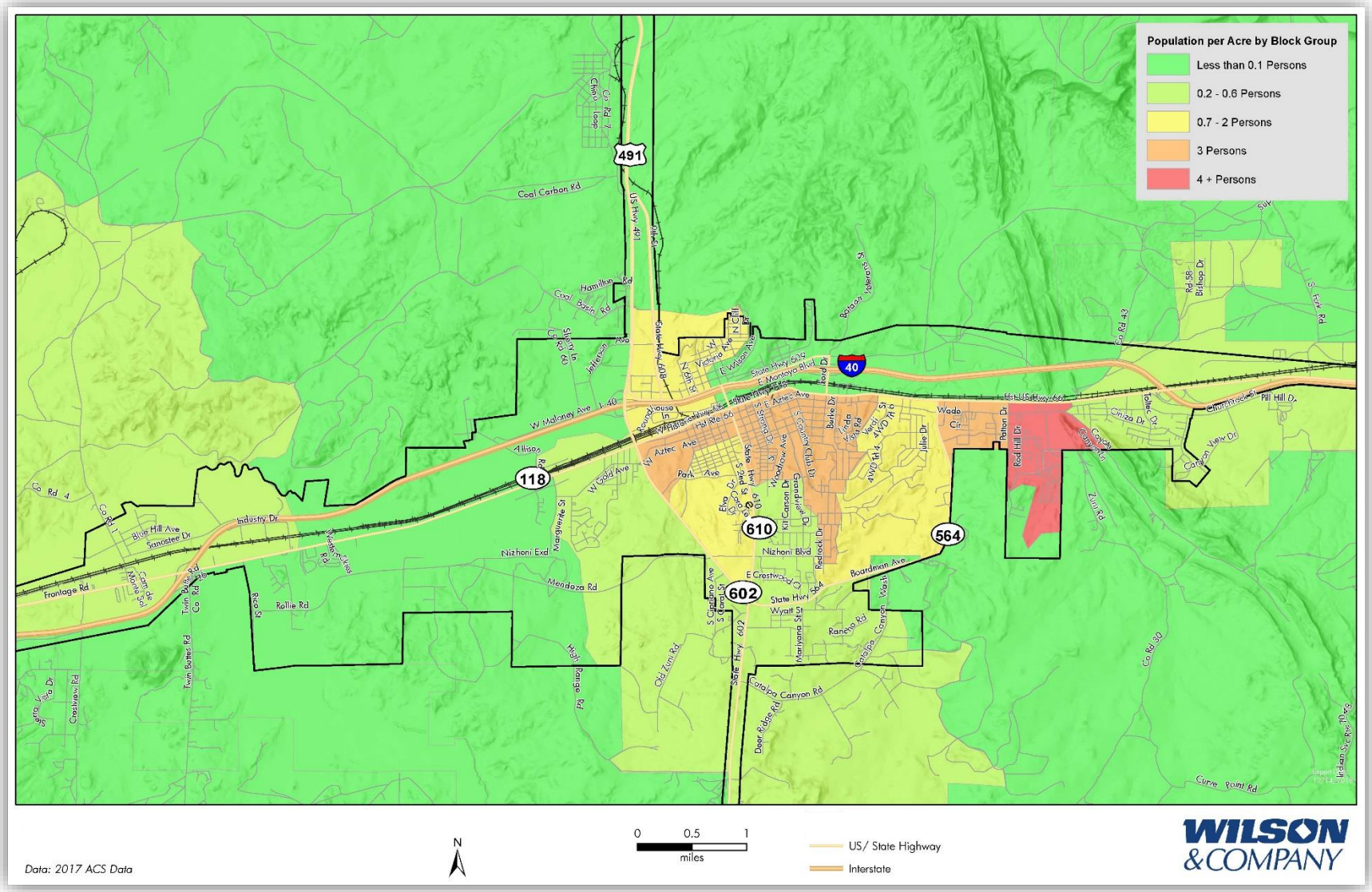


Figure 4 | Gallup Population Density

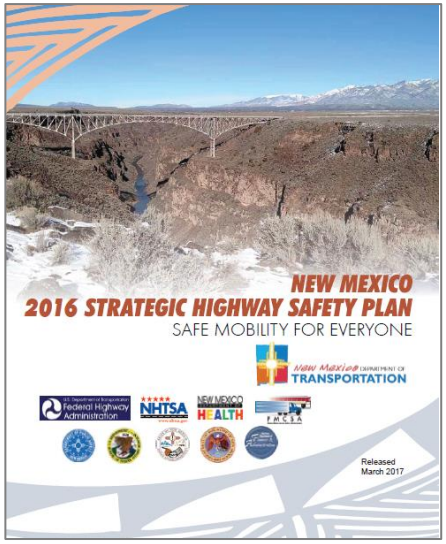
2.2 Review of Existing Plans

The project team reviewed the following related plans to understand the planning context and work most recently completed in the study area as of March 2019. Each plan summarized below highlights key information. Some of the plans are statewide efforts, such as the New Mexico Strategic Highway Safety Plan (SHSP), and other plans are specific to the City of Gallup or a location within Gallup.

2.2.1 New Mexico Strategic Highway Safety Plan

***Date*: 2016 *Agency*: NMDOT**

The SHSP is the overarching transportation safety plan for New Mexico. The plan establishes a vision of "Safe Mobility for Everyone," with a primary goal of reducing fatalities and serious injuries for all users on New Mexico roadways. The SHSP identifies 10 High-Priority Focus Areas, including distracted and impaired driving, based on how often the Focus Area contributes to fatal and serious injury crashes. Additionally, there are 10 Priority Emphasis Areas, including "older drivers" and "bicycles." For each of these Emphasis Areas, the SHSP recommends a number of strategies, each one focusing on the "4Es": engineering, education, enforcement and emergency medical services (EMS). The 4Es approach to highway safety is recommended by the Federal Highway Administration (FHWA).[1] Table 2 summarizes the High-Priority Emphasis Areas, which utilize 2007 to 2012 crash data. The plan is available online at http://dot.state.nm.us/content/dam/nmdot/planning/NMDOT_2016_SHSP.pdf.



[1] United States Department of Transportation, Federal Highway Administration, Office of Safety, "Highway Safety Improvement Program Top 10 Characteristics of a Successful State," last modified April 1, 2019, https://safety.fhwa.dot.gov/hsip/resources/characteristics10.cfm (accessed May 6, 2019).

Table 2 | NM 2016 SHSP Emphasis Areas

High-Priority Emphasis Areas	*Description*	Priority Safety Strategies
Road Departure	*A road departure is defined as a non-intersection crash that occurs after a vehicle crosses an edge line, road edge, or a centerline, or otherwise leaves the travel lane.*	• Keep vehicles from encroaching on the roadside by installing various proven treatments. • Install proven treatments to reduce the likelihood and/or severity of head-on crashes on two-lane and multi-lane roadways. • Minimize the likelihood of crashing into an object or overturning if the vehicle travels off the shoulder.
Distracted Driving	*Distracted driving involves anything that causes visual, manual, or cognitive distraction.*	• Increase public awareness of distracted driving using aggressive "Just Drive" public education and awareness campaigns that support the State's ban on all electronic communications while driving. • Increase and strengthen high-visibility enforcement of cell phone use/text messaging and electronic communication device laws. • Improve data collection and reporting for distracted driving crashes.
Impaired Driving	*Traffic crashes involving a driver with a blood alcohol concentration (BAC) of 0.08 or higher are considered alcohol-impaired driving crashes.*	• Conduct aggressive, high-visibility DWI enforcement campaigns. • Increase education for judges on drug impairment tests, improve awareness and communication with courts to make sure drug screening occurs, and protect funding for Drug Court programs. • Allow NM Dept. of Health, Scientific Labs Division to testify via video conference.
Speeding/Aggressive Driving	*A crash is speed related if the driver is charged by a law enforcement officer for racing, driving too fast for conditions, or exceeding the posted speed limit. Aggressive driving also involves unsafe driving behaviors such as exceeding safe speeds for road conditions or following too closely.*	• Increase funding to conduct highly visible, publicized, and saturated enforcement campaigns at locations with a higher incidence of aggressive driving/speed-related crashes. • Increase public awareness of potential risks and penalties of being stopped by law enforcement for driving at high speeds and aggressive driving in rural communities and on rural roads. • Provide funding to conduct enforcement and associated public information campaigns in rural areas, and initiate efforts to collect local crash data to assess performance.
Use of Safety Restraints	*Use of safety restraints includes the use of seat belts and/or child safety seats.*	• Provide enhanced enforcement and focused communication outreach to population groups with lower safety restraint use rates. • Sustain New Mexico's comprehensive Child Restraint Program. • Conduct a child safety restraint observation survey.
Motorcycles	*Motorcycle crashes can involve the motorcycle alone, the motorcycle and a fixed object, or multiple vehicles where one is a motorcycle.*	• Implement an incentive program for helmet use. • Support licensing and rider training programs that adequately teach and measure skills and behaviors required for crash avoidance. • Fund motorcycle safety programs to increase rider awareness of the risks of operating a motorcycle while impaired (alcohol and/or drugs).

High-Priority Emphasis Areas	*Description*	Priority Safety Strategies
Pedestrians	*Pedestrian crashes involve a collision with a driver of a vehicle within the public right-of-way and include any person on foot, sitting, lying down, or operating a mobility assistance device.*	• Explicitly include the safety of all road users in the design of transportation projects, including maintenance projects and plans. • Include safe interaction and connectivity of transit, pedestrian, and bicycle modes in the planning, design, and construction of transportation facilities. • Continue to improve the collection and analysis of pedestrian crash data (whether or not a motor vehicle was involved) and facilitate the development of an integrated database that includes all data collected at state, local, and regional levels (Metropolitan Planning Organizations [MPOs] and Regional Transportation Planning Organizations [RTPOs]).
Tribal Lands	*Tribal lands crashes occur on tribal lands.*	• Create a New Mexico task force on tribal transportation safety. • Conduct an annual Tribal Safety Summit to collaboratively identify and understand safety issues based on tribal context and needs. • Facilitate procedures, systems, and policies to support collection, sharing, and use of crash, citation, and EMS data among state, local, and tribal governments.
Young Drivers	*Young drivers of motor vehicles in crashes are classified as those who are 15 to 24 years old and live in New Mexico.*	• Enact a minimum age of 16 for learner's permit and full driver's license at age 18 to comply with the Moving Ahead for Progress in the 21st Century Act (MAP-21) and be eligible for Graduated Driver's License (GDL) Incentive Grant funding. • Improve content and delivery of driver's education/training, including vehicle recovery skills training, to comply with national driver's education standards. • Expand the hours for restricted nighttime driving for young drivers from the current 11:00 PM to 5:00 AM period to 10:00 PM to 5:00 AM.
Intersections	*Crashes that occur at an intersection of two or more roadways.*	• Reduce the frequency and severity of crashes at signalized and unsignalized intersections by implementing traffic control and operational improvements. • Reduce the frequency and severity of crashes at signalized intersections by implementing geometric improvements. • Improve visibility of the intersection by installing roadway lighting.

2.2.2 New Mexico Prioritized Statewide Bicycle Network Plan

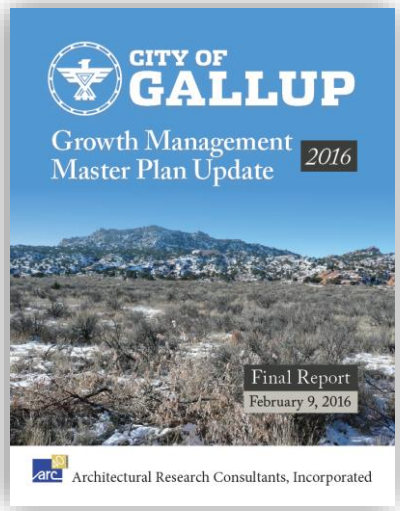
***Date*: December 2018 | *Agency*: NMDOT**

The *New Mexico Prioritized Statewide Bicycle Network Plan* (NM Bike Plan) delineates a statewide bicycle network overlaid on the state's existing highway network. The NM Bike Plan classifies highway segments across the state by tiers in order to show their level of benefit and the desired quality of bike infrastructure. Within Gallup, the NM Bike Plan classifies Route 66/NM 118 as Tier 1, which represents the highest potential demand for bicycling. The Tier 1 designation indicates the segment may be a candidate for more intensive bicycle infrastructure improvements, such as a buffered or separated bike lane. The other roadways in Gallup that are identified in the NM Bike Plan are US 491 (Tier 1), NM 602 (Tier 2), 2nd Street/NM 610 (Tier 1 and 2), and Boardman Drive/NM 564 (Tier 2). In urban areas, Tier 2 roadways have the same facility options as Tier 1 roadways. The plan is available online at http://dot.state.nm.us/content/dam/nmdot/BPE/NM_Bike_Plan.pdf.

2.2.3 Gallup Growth Management Master Plan

***Date*: 2016 | *Agency*: City of Gallup**

Last updated in 2016, the City's *Growth Management Master Plan Update* (Master Plan) is Gallup's comprehensive plan, which identifies needs and establishes goals in a variety of policy areas, including land use, economic development, housing, and utilities. The Master Plan also establishes a vision and goals for the City's transportation network, describing a broad goal to "develop a well-balanced transportation system that will provide for the safe and efficient movement of people and goods to, from and within Gallup" (pg. I-8). The Master Plan also includes specific transportation goals, such as developing a multimodal network, enhancing pedestrian safety, and addressing congestion in business districts. The Master Plan recommends improving transit service and bicycle facilities and enhancing planning processes from the local level through the state level. The plan is available online at http://www.gallupnm.gov/DocumentCenter/View/1211/2016-Growth-Management-Master-Plan-Update-Final.

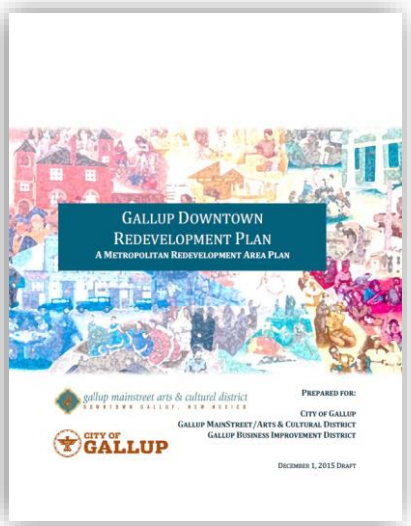


2.2.4 Gallup Downtown Redevelopment Plan

***Date*: 2015 | *Agency*: City of Gallup; Gallup MainStreet/Arts & Cultural District; Gallup Business Improvement District**

The *Gallup Downtown Redevelopment Plan*, a Metropolitan Redevelopment Area Plan (MRA Plan), is a revitalization plan focused on Gallup's historic downtown. Using a participatory public engagement process and a community analysis to identify areas of opportunity in the downtown area, the MRA Plan recommends catalyst projects. It also details business community and transportation recommendations within the central business district. The catalyst projects proposed focus on urban design improvements, new civic facilities, and mixed-use developments at key locations. The key transportation recommendations include:

- constructing bicycle and pedestrian improvements along Route 66/NM 118;
- making Coal Avenue more pedestrian friendly and installing features that would allow it to be occasionally closed and converted into an "event street" (see *Coal Street Concept Study* on page 19);
- building a pedestrian/bicycle underpass under the railroad tracks at 2nd Street/NM 610 *or* closing the railroad crossings at 2nd Street/NM 610 and 3rd Street; and
- evaluating the feasibility of a railroad "quiet zone" or relocation of the railroad currently located adjacent to downtown.



The plan is available online at http://www.gallupnm.gov/DocumentCenter/View/1013/Gallup-Downtown-MRA-Plan-Recommendations.

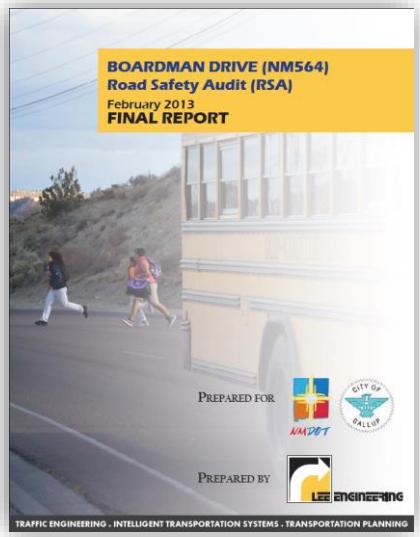
2.2.5 Boardman Drive/NM 564 Road Safety Audit

***Date*: February 2013 | *Agency*: NMDOT; City of Gallup**

This road safety audit (RSA) examines safety conditions along Boardman Drive/NM 564 from Route 66/NM 118 to Manor Drive. The study analyzes and provides recommendations on several elements of the roadway, including:

- signals;
- roadway capacity, auxiliary lanes, and delays;
- pedestrian connectivity with the adjacent school campus; and
- crashes.

The RSA particularly focuses on safety and traffic operations conditions at intersections near the Kennedy Middle/ Miyamura High School campus and close to Route 66/NM 118. Several modifications to the intersections are recommended. The RSA also considers the feasibility of a road diet—reducing the existing four-lane cross-section to three—along the length of the study alignment, as a key intervention to slow traffic and increase safety. The RSA found that the road diet was feasible, only causing a notable increase in vehicular delays during a short portion of peak hour. The RSA also notes that a new 4-foot bike lane would fit along most of the redesigned street.



NMDOT pursued the road diet (with bike lanes) recommendation, in addition to a number of signal improvements, and completed construction in 2018.

2.2.6 NM 118 Road Diet Feasibility Study

***Date*: February 2019 | *Agency*: NMDOT**

The goal of the study was to evaluate the feasibility of a road diet along Route 66/NM 118 between Arnold Street and Ford Drive.

The study finds that a change in the roadway section from five lanes to three lanes (two lanes with a two-way left-turn lane) would be workable and would not negatively impact traffic operations below acceptable levels. The study did find a reduction in level of service at the intersection of Route 66/NM 118 and Ford Avenue and consequently recommended that the road diet not be extended through that junction. The study notes that safety would likely improve as a result of a reduction in speeding and unsafe maneuvering by drivers and that improvements would support "previous and concurrent Gallup studies by promoting safety and livability along the NM 118 corridor."

2.2.7 Grade Separation Study: 2nd and 3rd Street Crossings

***Date*: 2007 (draft) | *Agency*: City of Gallup**
This draft study from 2007 examines the feasibility of a grade-separated crossing of the Burlington Northern Santa Fe (BNSF) railroad tracks at either 2nd Street/NM 610 or 3rd Street. The study recommends closing 3rd Street and constructing a 2nd Street/NM 610 Street underpass. The study notes that the railroad tracks would likely need to be moved to the north to make the underpass feasible. The study has never been finalized.

2.2.8 NM 118 / 2nd and 3rd Streets Road Safety Audit

***Date*: February 2019 | *Agency*: NMDOT**
This RSA study area consists of the intersections of Route 66/NM 118 and Maloney Avenue/NM 609 with 2nd Street/NM 610 and 3rd Street as well as BNSF rail crossings on 2nd Street/NM 610 and 3rd Street. The area has several safety issues and a history of vehicle, pedestrian, and rail crashes. The goal of the RSA is to determine safety deficiencies and hazards to public right-of-way users. The RSA also considers the safety impacts of closing one or both rail crossings on 2nd Street/NM 610 and 3rd Street. The final report released May 2019 proposes four alternatives and one special alternative:

- Alternative #1: Close the 3rd Street railroad crossing and divert all traffic to 2nd Street/NM 610, reconfigured as a two-way street from Maloney Avenue to Route 66/NM 118.
- Alternative #2: Close the 3rd Street railroad crossing and divert all traffic to 2nd Street/NM 610, reconfigured as a two-way street from Maloney Avenue to Green Avenue.
- Alternative #3: Close the 2nd Street/NM 610 railroad crossing and divert all traffic to 3rd Street, reconfigured as a two-way street from Maloney Avenue to Route 66/NM 118.
- Alternative #4: No modifications.
- Special Alternative: Pedestrian underpass, as detailed in the Gallup Downtown Redevelopment Plan (see section 2.2.4).

2.2.9 Coal Street Concept Study

***Date*: 2018 | *Agency*: City of Gallup; gallupARTS**
The idea of redesigning Coal Street is included in the 2015 Downtown Redevelopment Plan, where it was among the top projects to receive support from the public. In 2017, the City of Gallup received funding from the National Endowment for the Arts to study converting three blocks of Coal Avenue between 1st and 3rd Streets into an "event street." Through a creative placemaking engagement process, the community prioritized a "Plaza Street" alternative. The proposed redesign calls for substantial urban design improvements, including gateway elements, retractable bollards, drainage elements, and other pedestrian and traffic calming improvements.

2.2.10 Allison Road Corridor and I-40 Interchange Study

***Date*: 2015 | *Agency*: NMDOT**
This location study identified an alignment for an extension to Allison Road near I-40 and the configuration of a new Allison Road interchange at I-40. The intent of the extension and interchange is to facilitate commercial development on the west side of Gallup, alleviate congestion at the US 491 Interchange to the east, and improve access and safety across the Rio Puerco and the BNSF railroad tracks. The study recommended six phases of improvements on Allison Road:

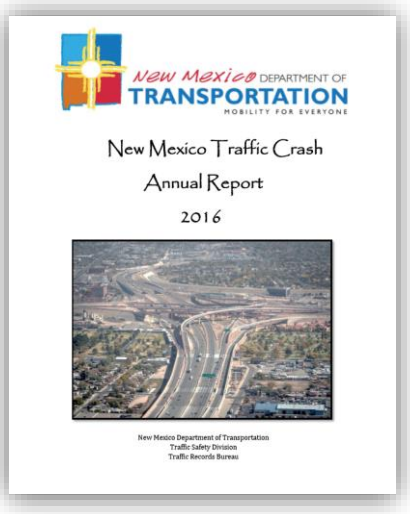
1. Replace the Rio Puerco Bridge, which dates back to the 1940s.
2. Construct an overpass over Route 66/NM 118 and the BNSF railroad tracks.
3. Construct an Allison Road/I-40 overpass.
4. Connect Allison Road to Maloney Avenue and Acoma Street.
5. Connect Allison Road to Kachina Street, near the Walmart and Home Depot development.
6. Implement the I-40 Interchange improvements and construct frontage roads.

2.2.11 New Mexico Traffic Crash Annual Report 2016

***Date*: May 2018 | *Agency*: NMDOT Traffic Safety Division, Traffic Records Bureau; UNM Geospatial and Population Studies, Traffic Research Unit**
The *New Mexico Traffic Crash Annual Report: 2016* provides the latest summary of crashes across New Mexico and includes data from 2012–2016. The statistics in the report include the following:

- In 2016, Gallup had 36.5 crashes per 1,000 residents; this rate compares with 34.2 in Albuquerque, 12.6 in Rio Rancho, and 30.1 in Farmington.
- Alcohol-involved crashes in Gallup far exceed per capita rates in other New Mexico Cities. In 2016, Gallup had 38.8 alcohol-involved crashes per 10,000 residents; this rate compares with 12.0 in Albuquerque, 5.9 in Rio Rancho, and 19.2 in Farmington.

This report is available at https://gps.unm.edu/gps_assets/tru_data/Crash-Reports/Annual-Reports/annual-report-2016.pdf.

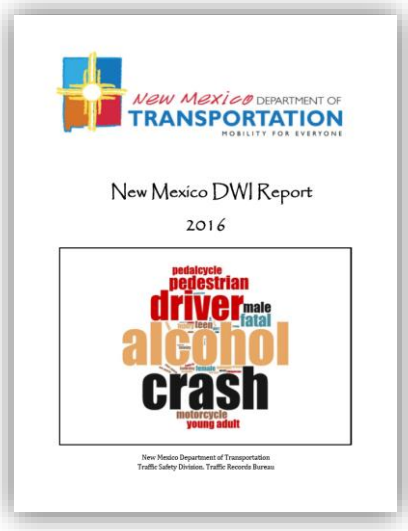


2.2.12 New Mexico DWI Report 2016

***Date*: April 2018 | *Agency*: NMDOT Traffic Safety Division, Traffic Records Bureau; UNM Geospatial and Population Studies, Traffic Research Unit**

The *New Mexico DWI Report: 2016* is the latest summary of alcohol-involved crashes across New Mexico and includes data from 2007–2016. The statistics in the report include the following:

- Driving While Intoxicated (DWI) arrests across the state steadily decreased from 13,810 in 2013 to 10,344 in 2016,
- From 2013 through 2016, alcohol-involved crashes made up 5 percent or less of crashes in New Mexico.
- Alcohol-involved crashes consistently account for approximately 40 percent of fatal crashes across the state.
- From 2012 through 2016, more than 20 percent of all pedestrian-involved crashes involved alcohol. That period contrasts with the years 2008 through 2011, when fewer than 20 percent of all pedestrian-involved crashes involved alcohol.



This report is available at https://gps.unm.edu/gps_assets/tru_data/Crash-Reports/DWI-Reports/2016-dwi-report.pdf.

2.2.13 NMDOT 2016 Community Report: Gallup

***Date*: December 2017 | *Agency*: NMDOT Traffic Safety Division, Traffic Records Bureau; UNM Geospatial and Population Studies, Traffic Research Unit**

The *2016 Community Report: Gallup* summarizes crash data for Gallup between 2012 and 2016, with some variables examined as far back as 2007. The report presents data on crash number, type, severity, location, alcohol involvement, and other variables identified in police crash reports for recent years. Notable statistics from the report include the following:

- The number of annual crashes increased over the five-year time horizon with 738 crashes in 2012 and 827 crashes in 2016.
- The number of annual alcohol-involved crashes also increased with 68 crashes in 2012 and 88 crashes in 2016.
- The number of alcohol-involved fatal and injury crashes increased from 31 crashes in 2012 to 40 crashes in 2016; 2015 represented the highest number in the five-year time horizon with 52 fatal and injury crashes.

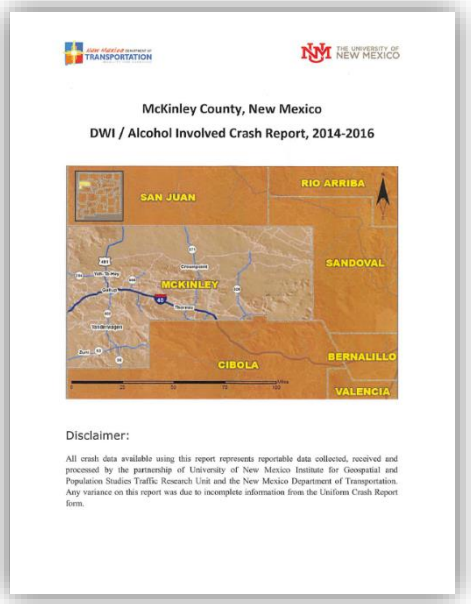
The report also examines crashes by time of day, day of week, vehicle type, crash type, and seat belt use. Figures for DWI crashes are also discussed in the McKinley County DWI report (detailed in Section 2.2.14 below).
This report is available at https://gps.unm.edu/gps_assets/tru_data/Crash-Reports/Community-Reports/2016-community-reports/2016-community-reports-pdfs/City_Gallup_2016.pdf.

2.2.14 NMDOT McKinley County, New Mexico, DWI / Alcohol Involved Crash Report, 2014–2016

***Date*: March 23, 2018 | *Agency*: NMDOT Traffic Safety Division, Traffic Records Bureau; UNM Geospatial and Population Studies, Traffic Research Unit**

The *McKinley County New Mexico DWI / Alcohol-Involved Crash Report, 2014–2016* is a tabulation of data from law enforcement reports on alcohol-involved crashes that occurred between 2014 and 2016. Key insights of the report include the following:

- There were 155 alcohol-involved crashes in McKinley County in 2016, a drop from 180 in 2015 and 177 in 2014.
- Among the 2016 alcohol-related crashes, most (79) were classified "Property Damage Only," 65 involved injury (serious and non-serious injury), and 11 were fatal. The counts of both injury and fatal crashes were down slightly from previous years, but the share of fatal crashes increased in 2016 from 2015.
- Across all three years, approximately half of DWI arrests were first-time DWI offenses, and half of those first-time offenses were committed by 20–29-year-olds.
- Within Gallup, 42 "pedestrian-involved including alcohol involvement" crashes were recorded in those three years. Thirty-nine of those crashes involved the pedestrian being under the influence. A significant share of these crashes occurred in the area of Downtown Gallup, with most of the rest taking place along the city's major streets, including I-40, US 491, Route 66/NM 118, and NM 610.


McKinley County, New Mexico

DWI / Alcohol Involved Crash Report, 2014-2016

Disclaimer:

All crash data available using this report represents reportable data collected, received and processed by the partnership of University of New Mexico Institute for Geospatial and Population Studies Traffic Research Unit and the New Mexico Department of Transportation. Any variance on this report was due to incomplete information from the Uniform Crash Report form.

2.3 Transportation System

2.3.1 Roadway Network

Functional Classification

Gallup is located off I-40, in the western part of New Mexico. The main east-west roadways are I-40, Route 66/NM 118, Maloney Avenue, and Aztec Avenue. I-40 is a four-lane, divided interstate with 12-foot lanes. Route 66/NM 118 is generally a five-lane principal arterial with two lanes in each direction and a two-way left turn lane. It is used as a detour route when I-40 is closed due to crashes or inclement weather conditions. Maloney Avenue is a five-lane principal arterial with two lanes in each direction and a two-way left turn lane. Aztec Avenue is a three lane principal arterial with one lane in each direction and a two-way left turn lane. The main north-south roadways in Gallup are US 491/NM 602, 2nd Street/NM 610, 3rd Street, and Boardman Drive/NM 564. US 491/NM 602 ranges from a two-lane, undivided principal arterial to a six-lane, divided principal arterial and serves as the primary access to Navajo Nation, which is approximately 3.5 miles north of Gallup. Second Street/NM 610 is a two-lane, principal arterial that is a northbound one-way street in the downtown area between Boardman Drive/NM 564 and Maloney Avenue/NM 609. South of the downtown area, 2nd Street/NM 610 is a three-lane roadway with one lane in each direction and a two-way left turn lane. Third Street is a two-lane, principal arterial that is a southbound one-way street in the downtown area between 2nd Street/NM 610 and Maloney Avenue/NM 609. Boardman Drive/NM 564 is a principal arterial and a two-lane, undivided roadway from 2nd Street/NM 610 to Manor Drive. From Manor Drive north to Route 66/NM 118, Boardman Drive/NM 564 is a three-lane roadway, with one lane in each direction and a two-way left turn lane. This section also includes bicycle lanes. The BNSF east-west rail line and I-40 physically limit connectivity between the north and south sides of the city. Established crossings are located at Ford Drive, 2nd Street/NM 610, 3rd Street, US 491/NM 602, and Allison Road. Ford Drive and US 491/NM 602 are grade-

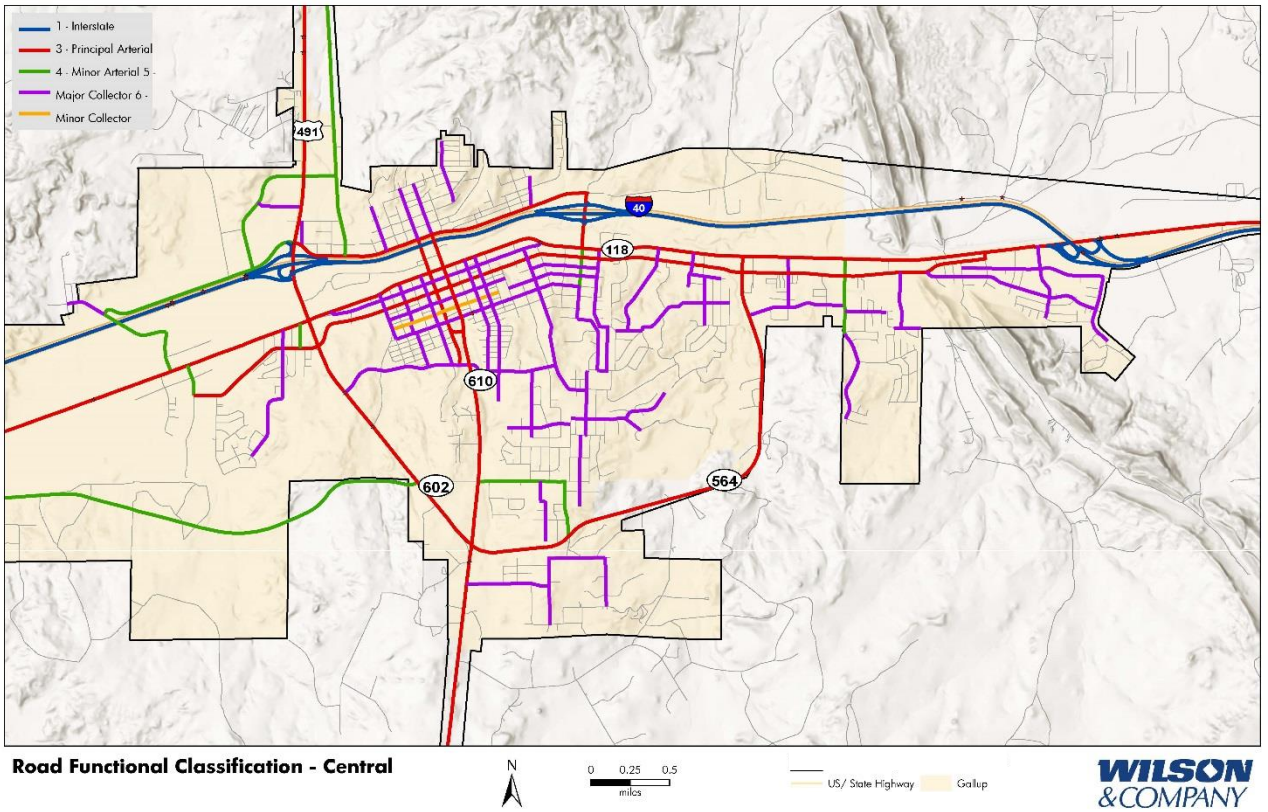


Figure 5 | Roadway Functional Classification

separated crossings, whereas 2nd Street/NM 610, 3rd Street, and Allison Road are at-grade crossings (see Section 2.3.2 for information on rail crossings). Figure 5 shows the functional classifications of the roadways within the study limits.

Interchanges and Configurations

There are four interchanges that provide access to Gallup from I-40: Exit 26, Exit 22, Exit 20, and Exit 16. These are described in detail below.

Exit 26: Route 66/NM 118

Exit 26 is the easternmost interchange to access Gallup, providing access to Route 66/NM 118, an east-west roadway. The interchange is a modified partial clover leaf with loop ramps for the I-40 westbound entrance ramp and the I-40 eastbound exit ramp-, (see Figure 6). Westbound I-40 drivers access the exit ramp via an approximately 320-foot diverging lane. The directional ramp is approximately 1,800 feet long and leads to a signalized T-intersection at Route 66/NM 118. To access I-40 westbound from Route 66/NM 118, drivers use the 1,030-foot loop ramp and merge approximately 550 feet onto the interstate. Eastbound I-40 drivers access Exit 26 via a 300-foot diverging lane to the exit loop ramp. The exit ramp is approximately 1,230 feet long and leads to an unsignalized intersection at Route 66/NM 118. To access I-40 eastbound from Route 66/NM 118, drivers can take the 2,145-foot directional ramp and merge approximately 370 feet onto the interstate.

Figure 6 | Exit 26: Route 66/NM 118 & I-40 East Interchange

Figure 7 | Exit 22: Ford Drive/I-40 Interchange

Exit 22: Ford Drive

Exit 22 is a full diamond interchange that provides access to Ford Drive, a north-south roadway (Figure 7). Westbound I-40 drivers access the exit ramp via a 330-foot diverging lane. The ramp is approximately 1,300 feet long and leads to an unsignalized intersection with Ford Drive. To access I-40 westbound from Ford Drive, drivers use the 1,670-foot ramp and merge 670 feet onto the interstate. Eastbound I-40 drivers access Exit 22 via a 385-foot diverging lane. The exit ramp is approximately 1,530 feet long and leads to an unsignalized intersection at Ford Drive. To access I-40 eastbound from Ford Drive, drivers use the 1,250-foot entrance ramp and merge approximately 310 feet onto the interstate.

Exit 20: US 491/NM 602

Exit 20 is a modified diamond interchange with a loop ramp that provides access to US 491/NM 602, a north-south roadway (Figure 8). Westbound I-40 drivers access the exit ramp via a 585-foot diverging lane. The ramp is approximately 1,050 feet long and leads to a signalized intersection with US 491/NM 602. To access I-40 westbound from US 491/NM 602, drivers use the 1,310-foot entrance ramp to merge about 400 feet onto the interstate. Eastbound I-40 drivers access Exit 20 via a 355-foot diverging lane. The exit ramp is approximately 1,730 feet long and leads to a signalized intersection at US 491/NM 602. To access I-40 eastbound from US 491/NM 602, drivers traveling northbound on US 491/NM 602 use the 1,600-foot entrance ramp and merge approximately 365 feet onto the interstate. Drivers traveling southbound on US 491/NM 602 use the 930-foot loop ramp to merge onto I-40 using the 1,490-foot acceleration lane.

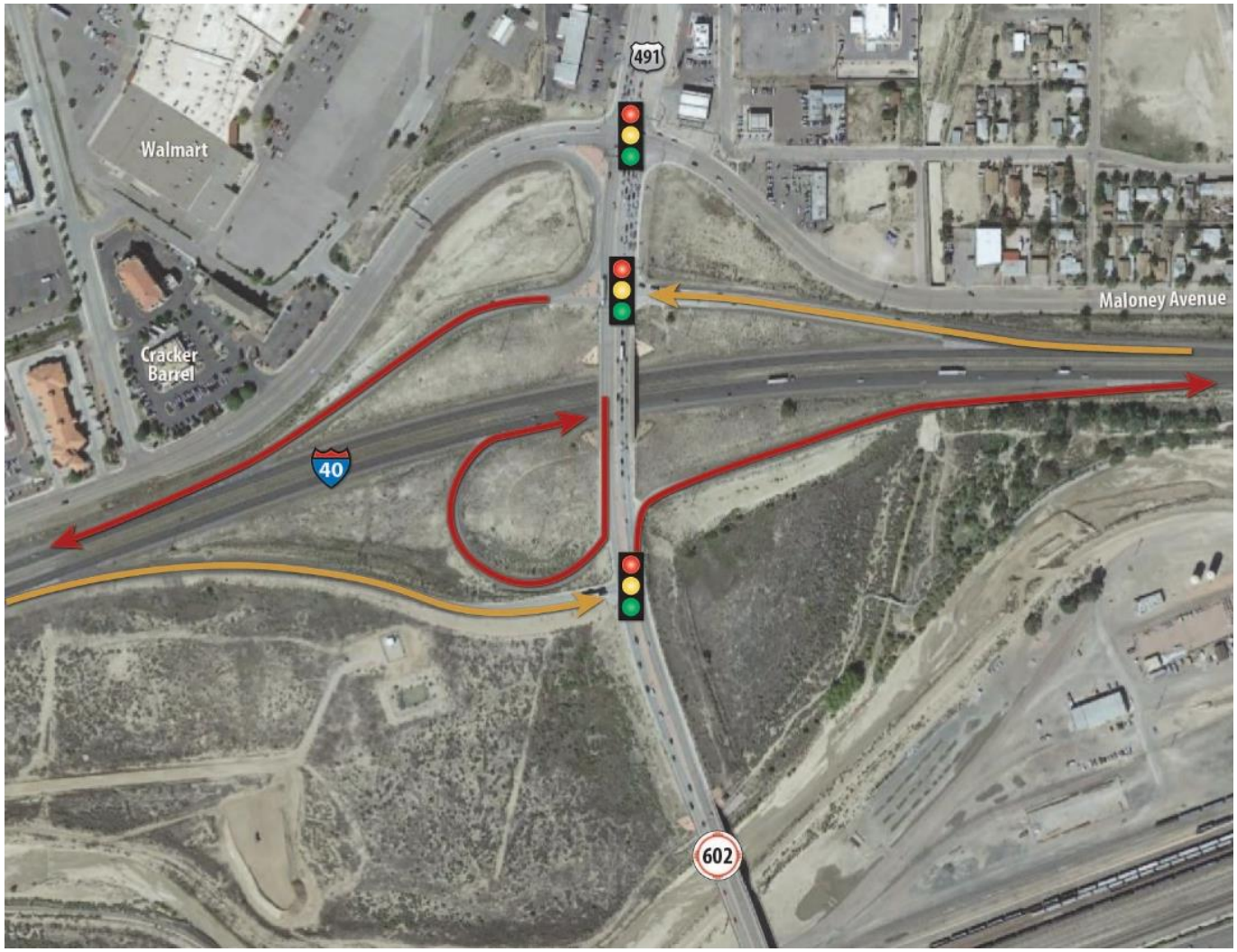


Figure 8 | Exit 20: US 491/I-40 Interchange

Figure 9 | Exit 16: Route 66/NM 118 & I-40 West Interchange

Exit 16: Route 66/NM 118

Exit 16 is the westernmost Gallup interchange providing access to Route 66/NM 118 (Figure 9). Westbound I-40 drivers access the exit ramp via a 900-foot deceleration lane. The ramp is approximately 1,555 feet long and leads to an unsignalized intersection with Route 66/NM 118. To access I-40 westbound from Route 66/NM 118, drivers use the 1,200-foot entrance ramp to merge onto the interstate via the 2,125-foot acceleration lane. Eastbound I-40 drivers access Exit 16 via a 1,530-foot deceleration lane. The exit ramp is approximately 2,260 feet long and leads to an unsignalized intersection at Route 66/NM 118. To access I-40 eastbound from Route 66/NM 118, drivers use the 1,240-foot loop ramp to merge onto the interstate via the 2,285-foot acceleration lane.

Intersection Traffic Control

There are currently 39 signalized intersections within the Gallup study limits. The majority of the signalized intersections are located within the downtown area, on US 491/NM 602 and on Route 66/NM 118. Figure 10 illustrates the signalized intersection locations.

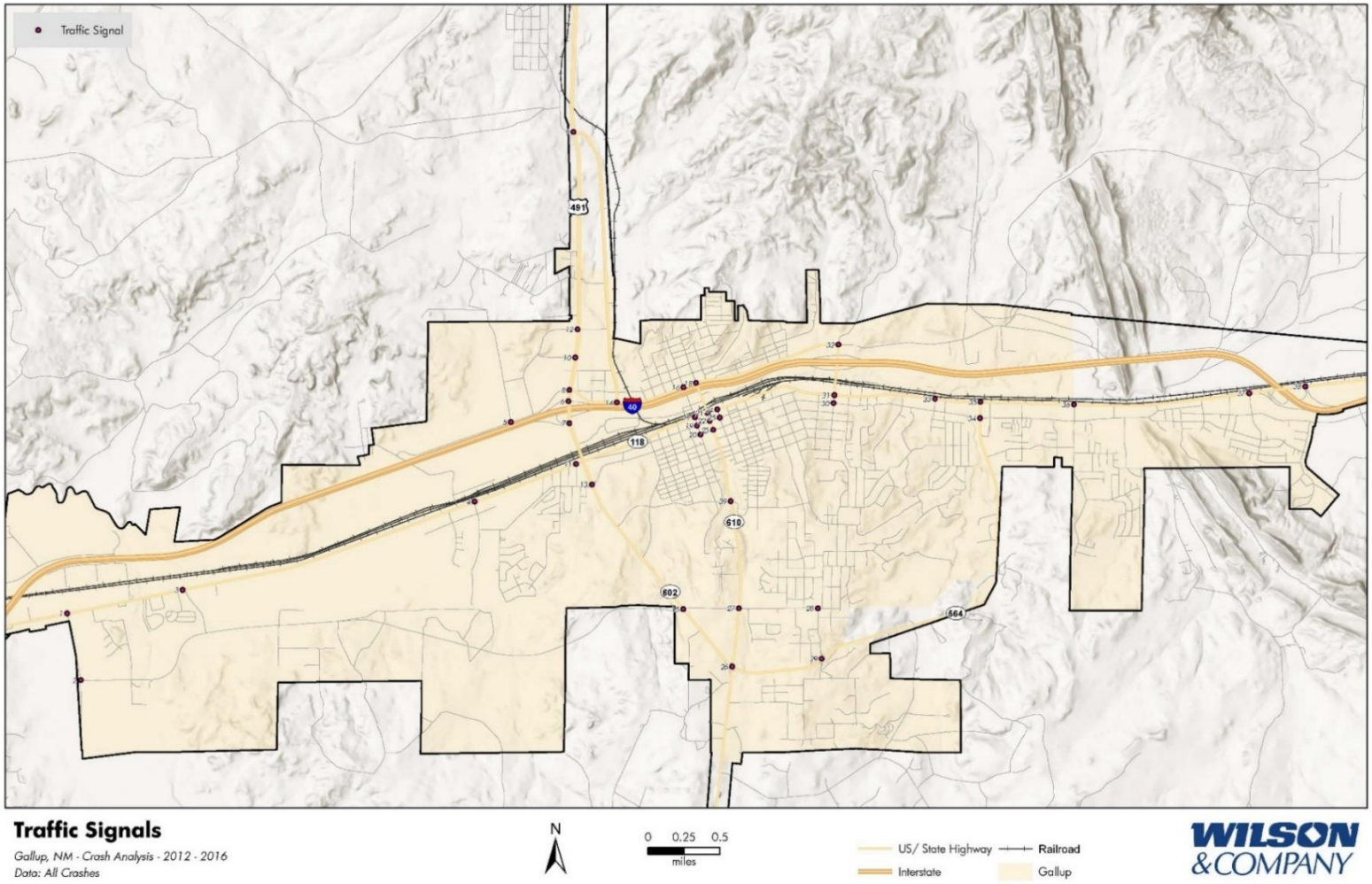


Figure 10 | Intersections with Traffic Signals

Sight Distance

A desktop review of sight distances at intersections was conducted along Route 66/NM 118, US 491, and Maloney Avenue. The sight distance obstructions evaluated include fixed objects, trees/vegetation, buildings, fence/walls, and major vertical curves. Figure 11 shows the location and type of obstruction present along these corridors.

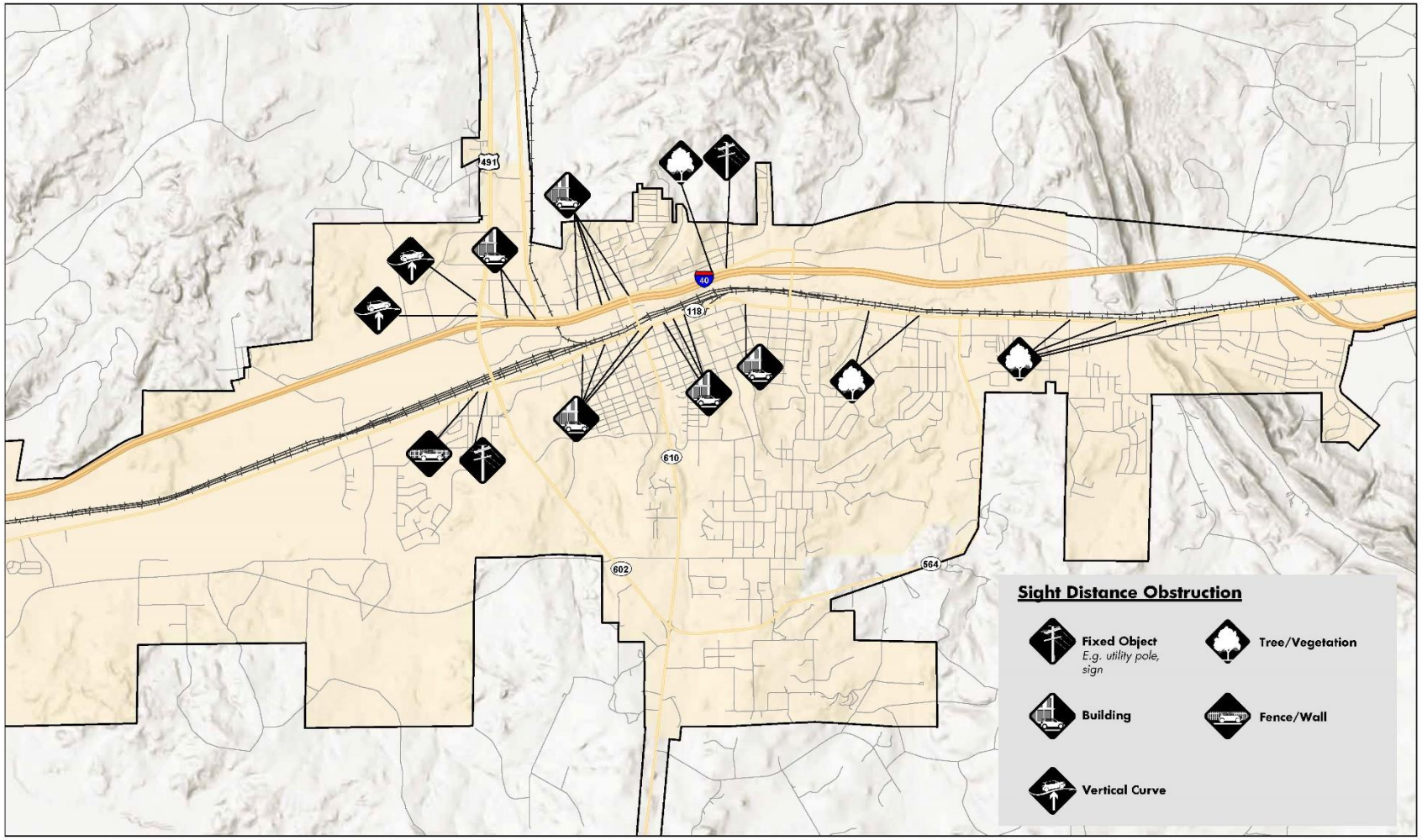
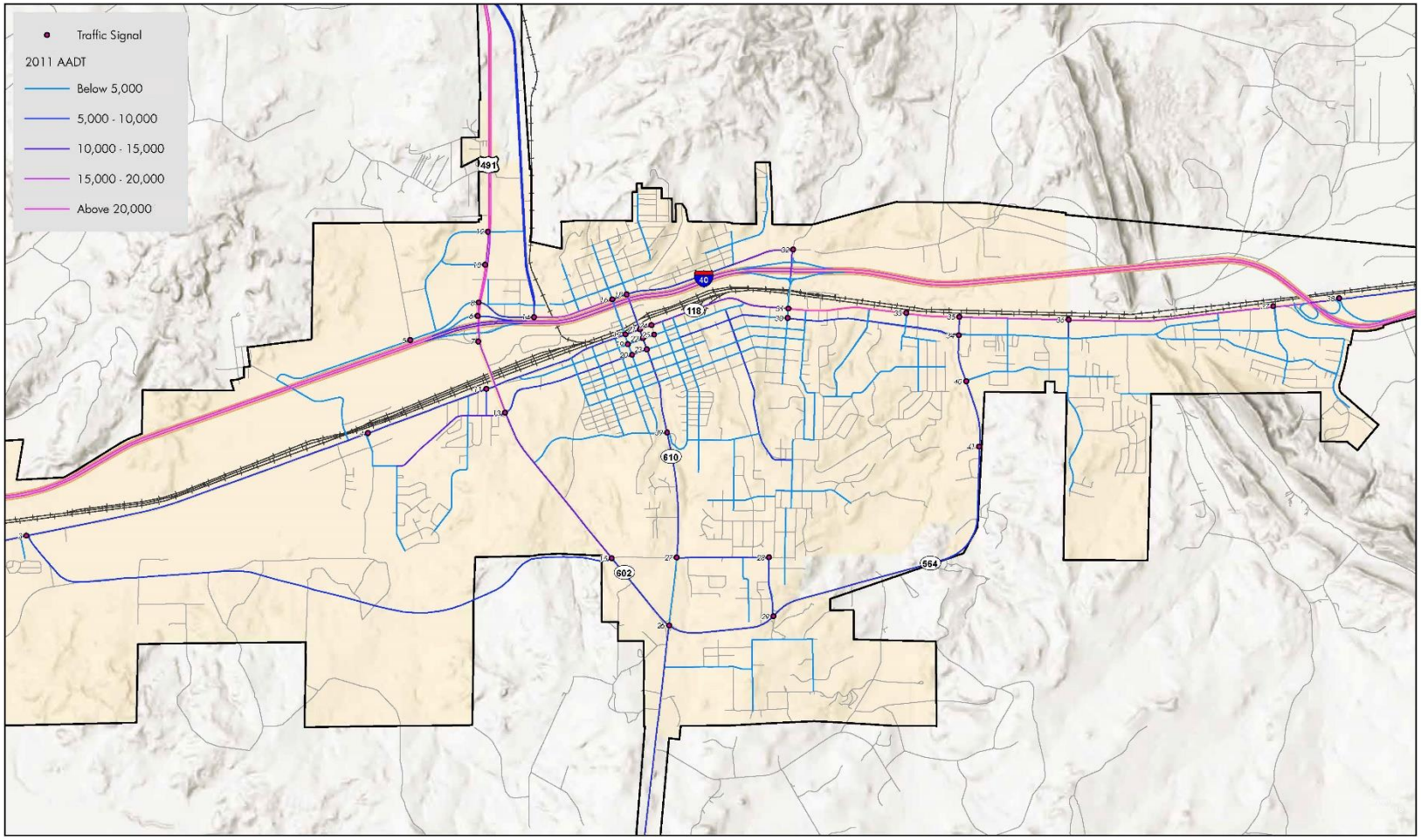


Figure 11 | Sight Distance Obstruction Locations

Traffic Count Data

NMDOT provided annual average daily traffic counts (AADT) extracted from the 2011 NMDOT GIS database. As shown in Figure 12, the highest AADT traffic volumes are located on I-40, US 491, and Route 66/NM 118.



Traffic Signal Location and Traffic Volume

Gallup, NM - Crash Analysis - 2012 - 2016

Figure 12 | Traffic Volumes

2.3.2 Railroad Facilities Overview

Alignment

BNSF's railway traverses the Gallup community and runs parallel to Route 66/NM 118. There is an Amtrak station near Route 66/NM 118 and 2nd Street/NM 610. The Amtrak building also houses the Gallup Cultural Center.

Crossings

Along the rail corridor, there are 13 railroad crossings. Figure 13 identifies the locations of the existing crossings and whether they are grade-separated or at–grade crossings.

Grade-separated crossings go across railroads either above or below the ground level (grade), separating trains from roadway traffic, thus not impacting traffic flow. There are seven grade-separated crossings within the corridor.

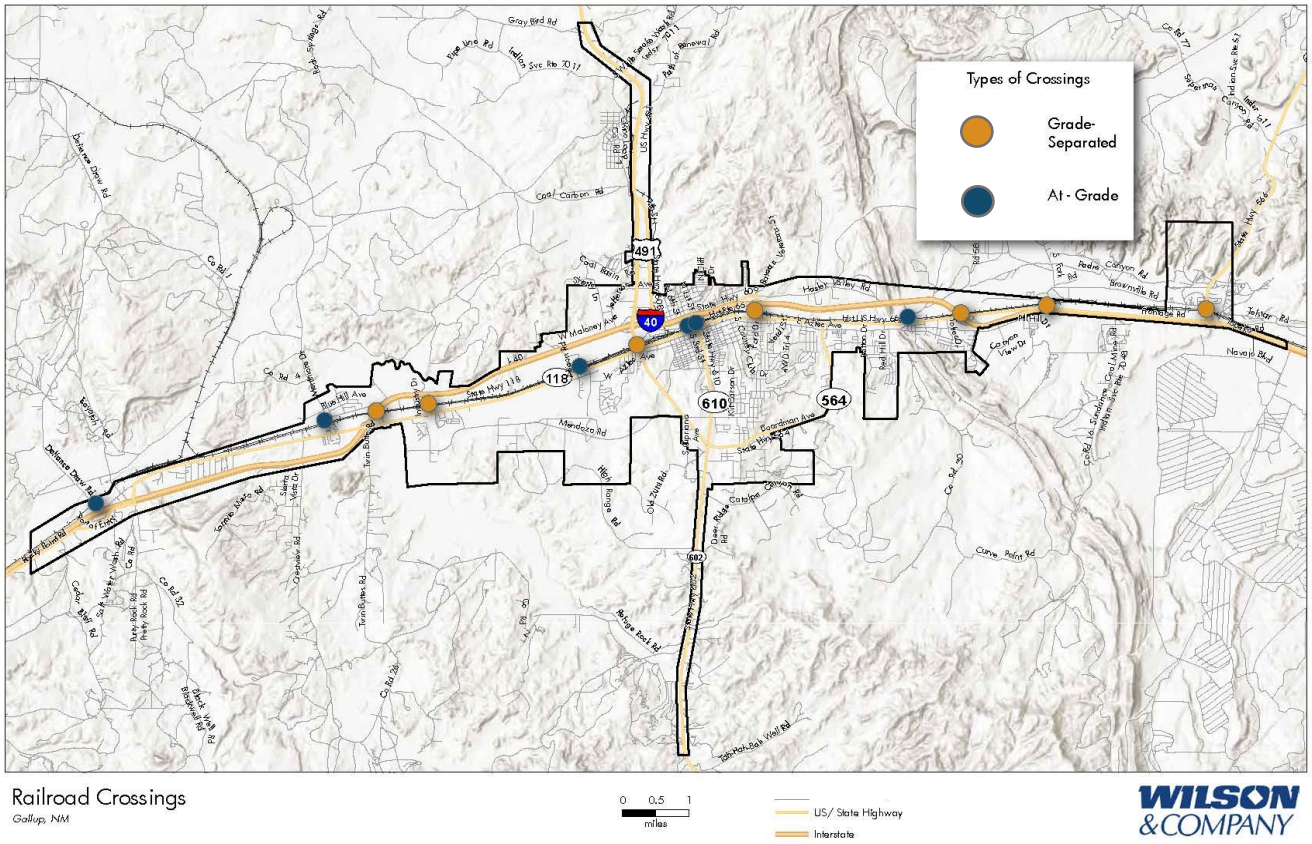


Figure 13 | Railroad Crossings

At–grade crossings cross railroads at the same grade. Traffic control devices warn through-traffic when a train is approaching and restrict crossings with activated gates and alarms. There are six at-grade crossings within the study area. There are two major at-grade crossings at 2nd Street/NM 610 and 3rd Street located one block from each other. The NM 118 / 2nd and 3rd Streets RSA evaluated the safety concerns at these two crossing locations and noted that the crossings lacked any pedestrian channelization or crossing guidance and noted that pedestrians regularly ignored railroad warning devices and walked around gates during active train crossings (see Section 2.2.8).

2.3.3 Pedestrian Facilities Overview

Pedestrian facilities such as sidewalks and trails are important path types used by people to reach their destinations. Sidewalks are present throughout parts of Gallup and consist of both attached and detached sidewalks.

Detached Sidewalks

Detached sidewalks incorporate a buffer space between the curb and/or traffic lane and the sidewalk. These buffer spaces can consist of physical separation between the traffic lane and sidewalk such as vegetation or visual separation such as red brick. Within Gallup, detached sidewalks exist in residential areas but are uncommon.

Attached Sidewalks

Attached sidewalks are not separated from the curb and/or traffic lane and are common in older historic areas with larger concentrations of commercial uses and heavy pedestrian traffic. Sidewalk widths vary throughout Gallup and tend to be wider downtown.

The gaps that exist between stretches of sidewalk are factors that affect a city's sidewalk network. Gaps between sidewalks make mobility difficult for pedestrians looking for a safe place to walk along a roadway. Additionally, obstructions such as utility boxes, as well as vertical/ horizontal curves in the roadway, can create line-of-sight issues, making it difficult for pedestrians and vehicles to see each other.

Strava Data

Strava is a private company that uses a smartphone app to crowdsource data indicating where people bicycle and walk. Strava uses this data to produce heatmaps, which may be used by practitioners to try and better understand pedestrian and bicycle activity. A Strava heatmap for the Gallup area (e.g., Figure 14) may indicate commonly used pedestrian and/or bicyclist routes and the frequency of use. This data is made available from smartphones that interact with GPS services found in "exercise" or "location" apps. This information is stripped of any personally identifiable information (PII) and made available to the public through Strava to better serve and understand pedestrian and bicyclist demand in communities. Because Strava users are self-selected, Strava data does not reflect a representative sample of the community. The data may, however, reveal patterns that indicate how people move through their community.

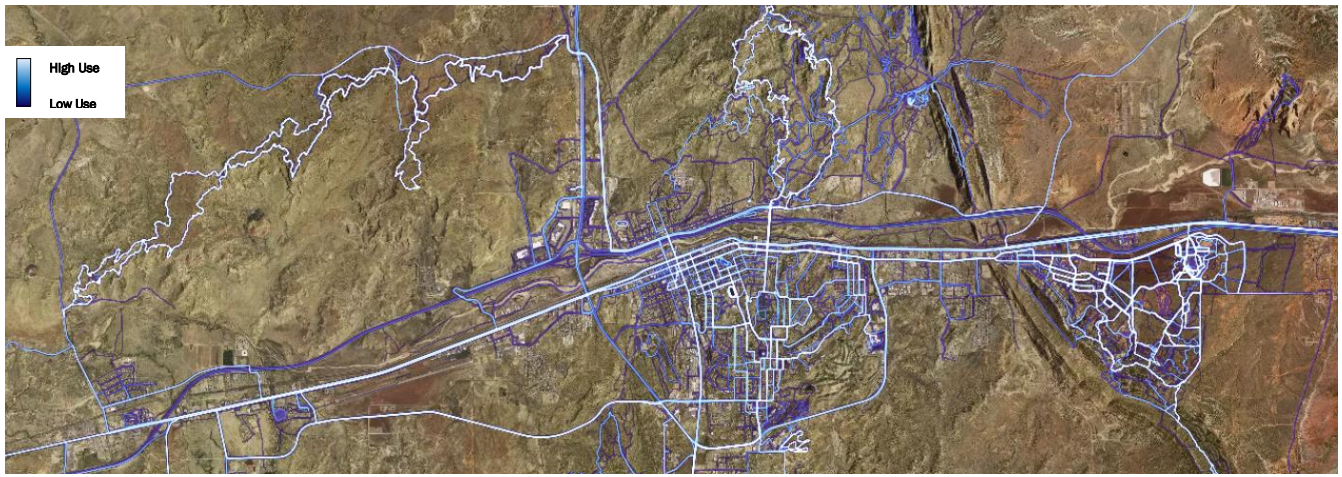


Figure 14 | Strava Bicyclist and Pedestrian GPS Data

Existing Sidewalk Inventory

As part of an existing conditions analysis, the project team completed a sidewalk inventory of four key areas, or nodes, in Gallup. Figures 15 through 20 show sidewalk availability. Gaps in the sidewalk network, or areas that have no sidewalks at all are documented. This study shows where sidewalk exists and does not take into account the condition and width of sidewalks or areas where driveways intersect a sidewalk, as it is intended to show a high-level understanding of existing pedestrian access, in contrast to Figure 14, which uses the Strava data to show where people may be generally walking.

Sidewalk Inventory: Node 1—Route 66/NM 118 & I-40 West

Figure 15 illustrates how I-40 is a barrier to pedestrians in the area of the western crossing of Route 66/NM 118 and I-40. The newer residential development along Cam De Monte Sol provides sidewalks throughout the neighborhood and cul-de-sacs leading up to Route 66/NM 118, but no facilities exist for pedestrians along the main route. East of I-40, along Route 66/NM 118, there are many gaps in the sidewalk network due to undeveloped parcels.

Figure 15 | Route 66/NM 118 & I-40 West Existing Sidewalks

Sidewalk Inventory: Node 2—Route 66/NM 118 Central Business District

The project team completed a second sidewalk inventory along the central business district of Route 66/NM 118. This area is seen in Figures 16 through 18. There are sidewalks along most of the south side of the corridor, and the City upgraded portions of the aging infrastructure to provide access that is compliant with ADA design standards. The north side of this corridor has fewer destinations and is immediately adjacent to the BNSF rail. In general, there are few pedestrian facilities on the north side of the corridor; however, there is a sidewalk system near the Gallup Cultural Center and Amtrak Station, as well as the business district surrounding Ford Drive.

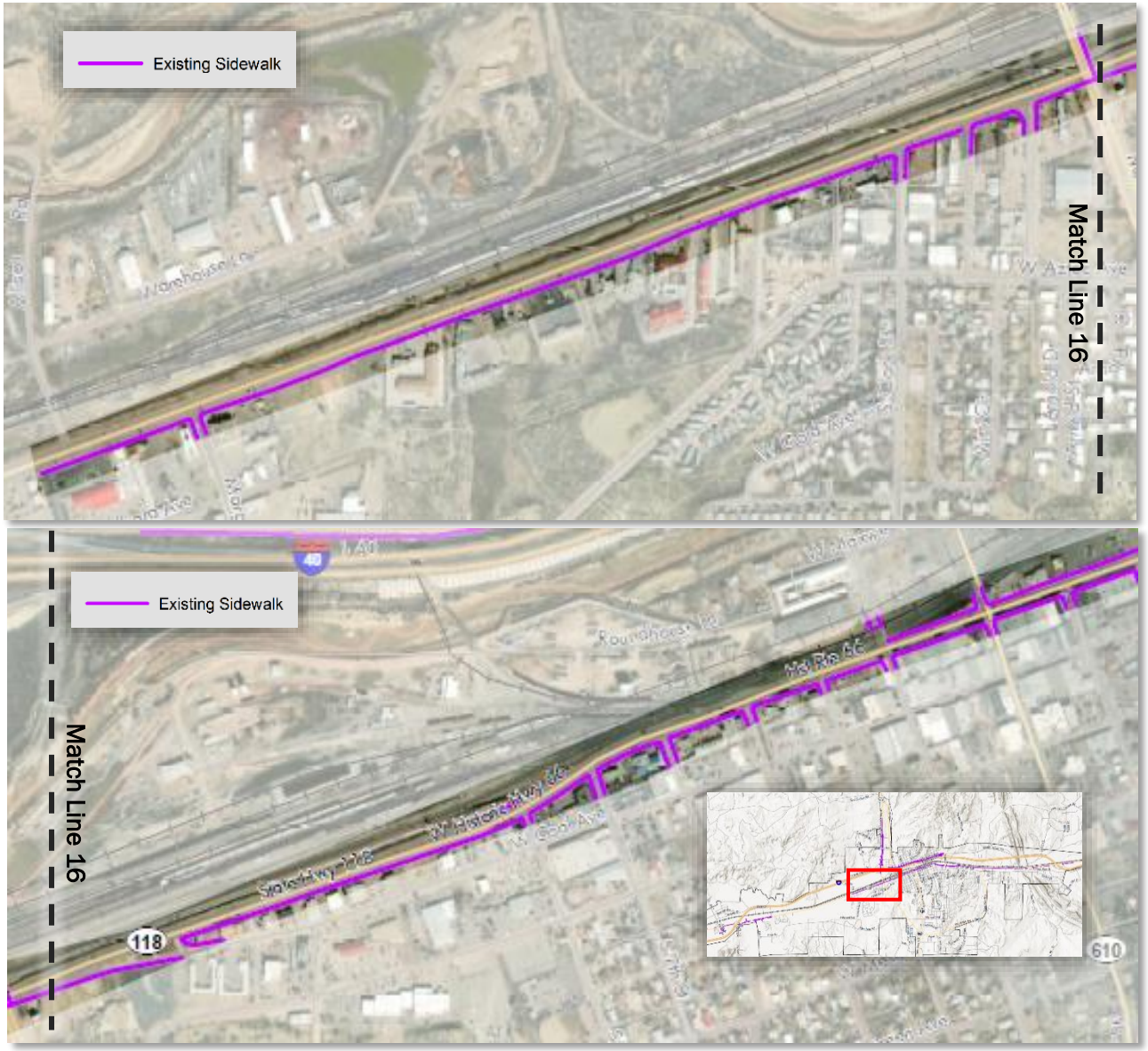


Figure 16 | Route 66/NM 118 (West) Existing Sidewalks

There are more gaps in the sidewalk network from the central to the eastern portion of this corridor where the development is lower density. Along this section, there are more vacant parcels than elsewhere on the corridor, but it is developing. There are few sidewalks where Route 66/NM 118 approaches I-40 near the eastern city limits of Gallup.

Figure 17 | Route 66/NM 118 (Central) Existing Sidewalks

Figure 18 | Route 66/NM 118 (East) Existing Sidewalks

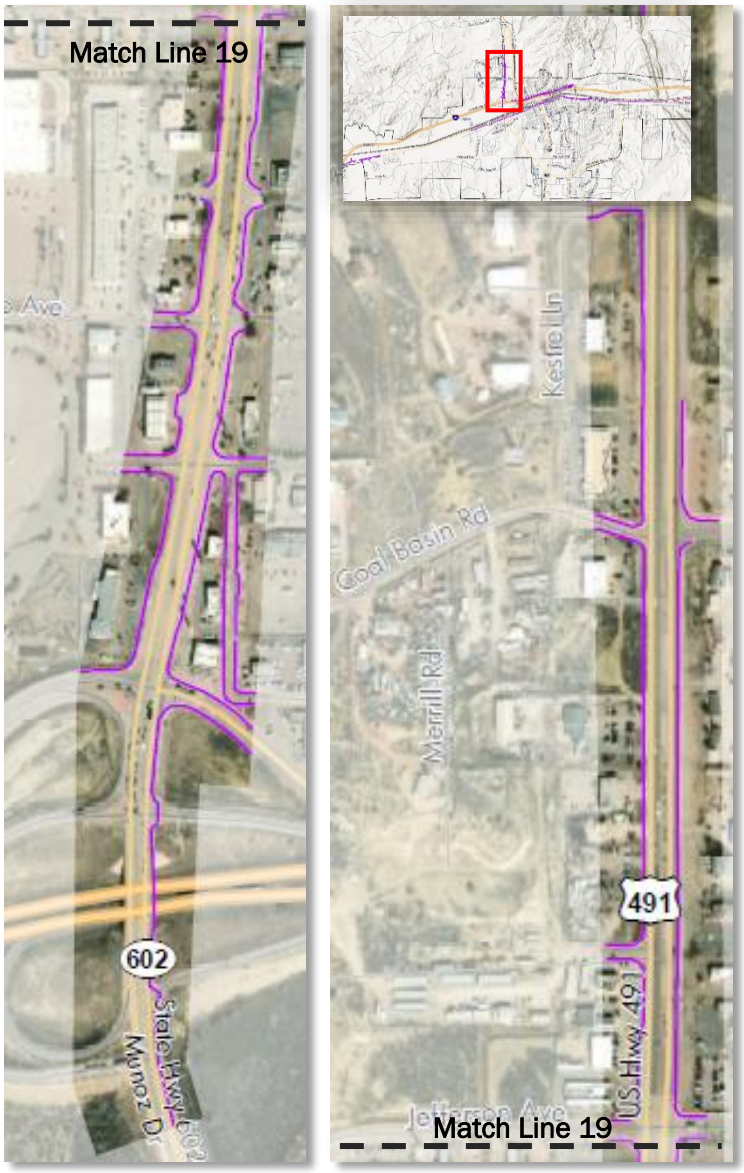


Figure 19 | US 491 Existing Sidewalks

Existing Sidewalk Inventory: Node 3—US 491

US 491, shown on Figure 19, is a north-south US highway that serves commercial properties near I-40 and some more industrial type uses further north. The sidewalk inventory mimics this development pattern, where a robust network exists on the southern half and sidewalks are not as common towards the north. However, some commercial parcels do not have direct connections to the sidewalks along the corridor, which means that pedestrians must cross through parking lots to access businesses. This corridor also provides a key north-south pedestrian connection over I-40 and the BNSF Railroad, with sidewalks on the east side of the bridge.

Existing Sidewalk Inventory: Node 4—Maloney Avenue

Maloney Avenue has sidewalks on the north and south side of the corridor within the study area, shown in Figure 20.

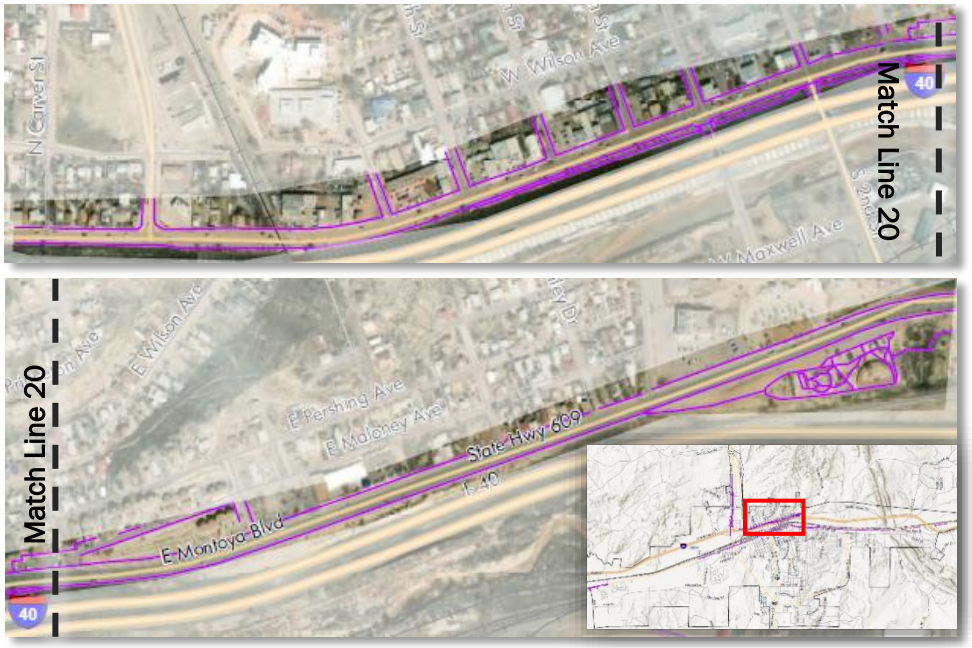


Figure 20 | Maloney Avenue Existing Sidewalks

This node has a mix of light commercial, multi-family and single-family residential development. This mixture of land uses and residential density makes it a walkable corridor, as residents and destinations are close enough to walk between. Toward the eastern section of Maloney Avenue, a multi-use path splits off from the sidewalk along the south side of the street and winds through Babe Ruth Park. Heatmaps from Strava show that pedestrians are using the park and crossing Maloney Avenue sporadically (Figure 21).

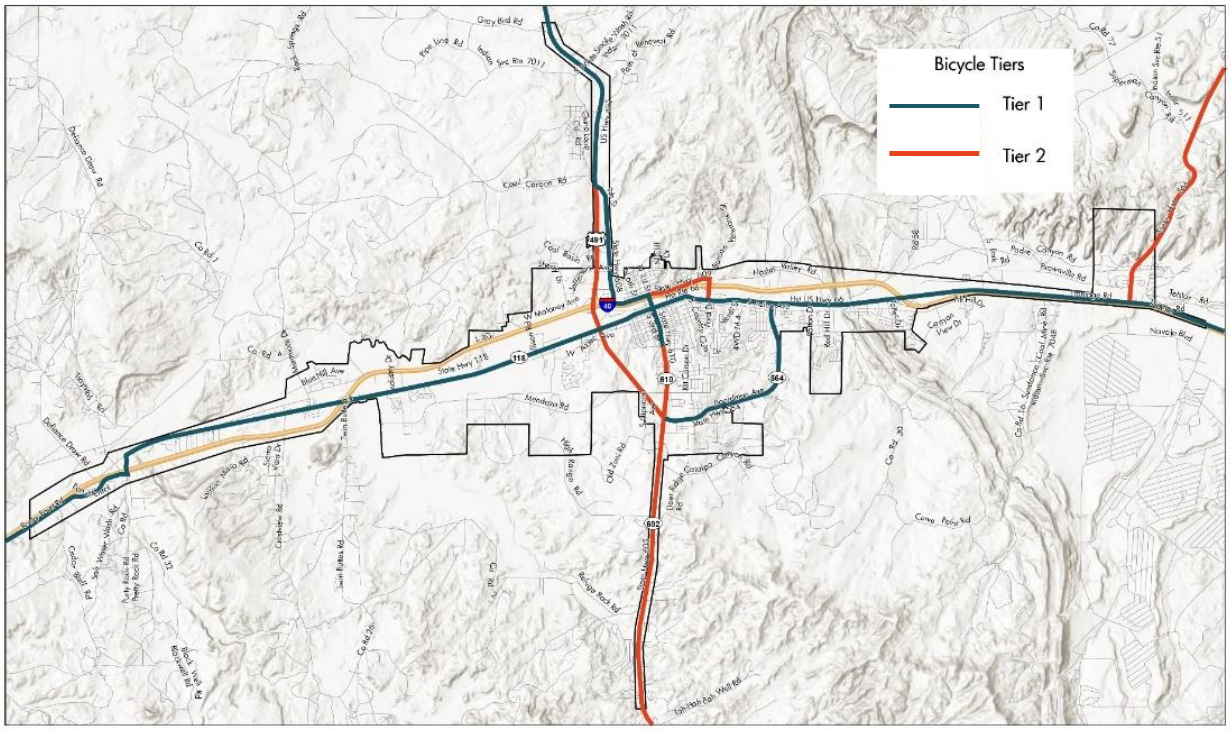
Figure 21 | Pedestrian Activity near Recreation Center

2.3.4 Bicycle Facilities Overview

Gallup lacks significant bicycle infrastructure in the study area. This area has major intersections and throughways with infrastructure that prioritizes vehicular traffic. There is a portion of a bike lane on Boardman Drive/NM 564 from Route 66/NM 118 to Aztec Avenue. Gallup does not have a bicycle plan but does have a Trails and Open Space Master Plan.

The *New Mexico Prioritized Statewide Bicycle Network Plan* (NM Bike Plan), delineates a statewide bicycle network and classifies each roadway segment by tier in order to show its level of benefit and the desired quality of bike infrastructure (Figure 22). Factors that determine the tier of bikeways include the level of local and statewide connectivity, public input, equity analysis, recreational and utilitarian demand, access to transit, and level of traffic volume and roadway speeds requiring separated bike infrastructure.

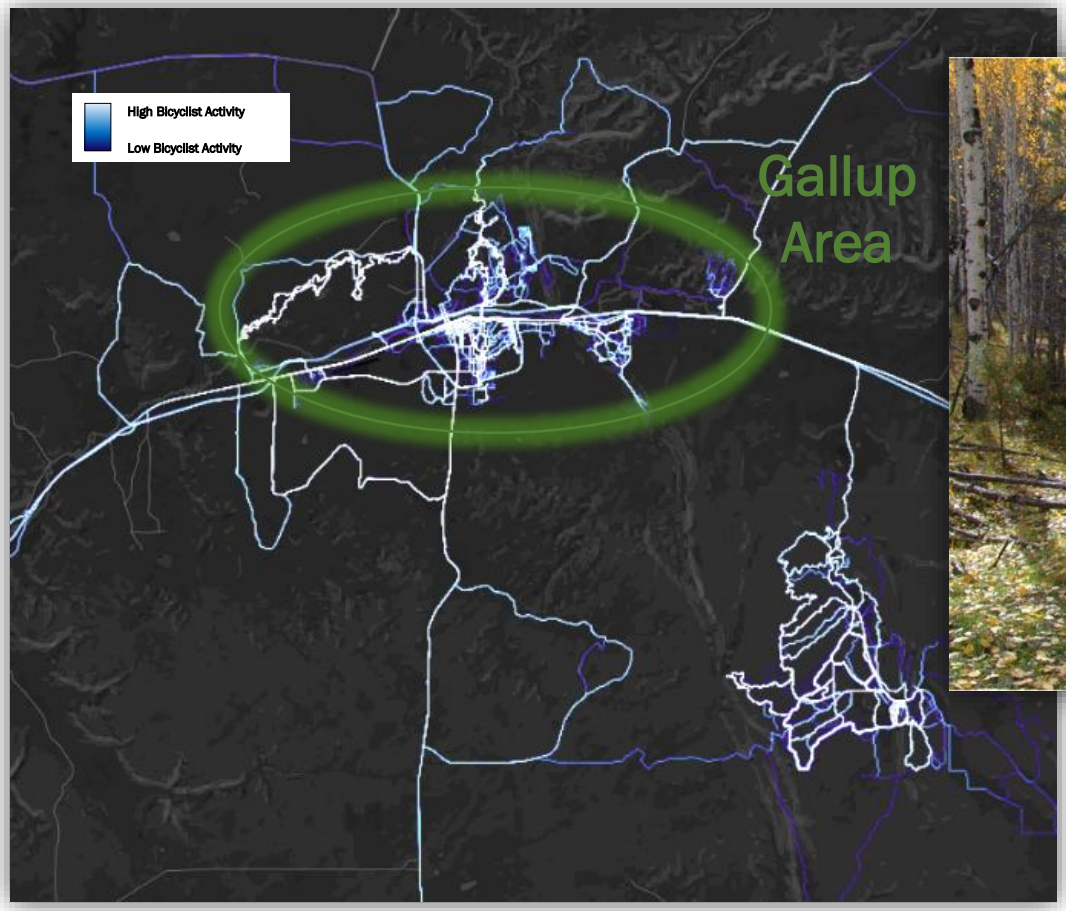
Route 66/NM 118 is classified as a Tier 1 facility; it is intersected by other routes classified as Tiers 1 and 2, including US 491, offering connectivity with other local bicycle corridors and trails.



NM Bike Plan - Bicycle Facility Tier Definitions		
Tier	*Level of Benefit*	*Desired Infrastructure Quality*
1	High	Highest level of dedicated infrastructure among NM highways
2	Medium	Minimum level of dedicated infrastructure for all Tier 2 NM highways; more than minimum level desired if roadway is high-speed and/or high-volume
2 Basic	Medium	No dedicated infrastructure required; signage and motorist awareness techniques desired
3	Low	Bikeway infrastructure not required (Source: NM Bike Plan)

Figure 22 | New Mexico Bike Plan Tiers

Approximately seven miles east of Gallup there are multiple off-road single-track mountain bike trails that are managed and maintained by Gallup Trails Incorporated, a 501(c)(3) nonprofit. These trails are not located within Gallup city limits, but they serve as a resource for bicycling in the larger area. Figure 23 includes a Strava heatmap that indicates the general location of these trails in relation to Gallup, and a contrast of usage. These trail systems include the Zuni Mountain Trails and High Desert Trail System.



Aspen Corridor Trail, Zuni Mts. *Source:* GallupTrails.com

Figure 23 | Gallup Trails (Strava Data)

2.3.5 Transit Network

A transit network is a significant generator of pedestrian activity. The location of a transit stop and a sidewalk can affect the safety of pedestrians accessing transit. Gallup has two transit providers—Gallup Express and Navajo Transit System (Figure 24). Gallup Express stops tend to be located on roads offset from arterials, such as Aztec Road, whereas Navajo stops tend to be on arterials, such as Route 66/NM 118.

Gallup Express operates from Monday through Friday and provides a route deviation service a quarter mile from the established routes for scheduled pick-up and drop-off services. Gallup Express has four different routes: Gallup Express South, Gallup Express East, Gallup Express West, and Gallup Express North.

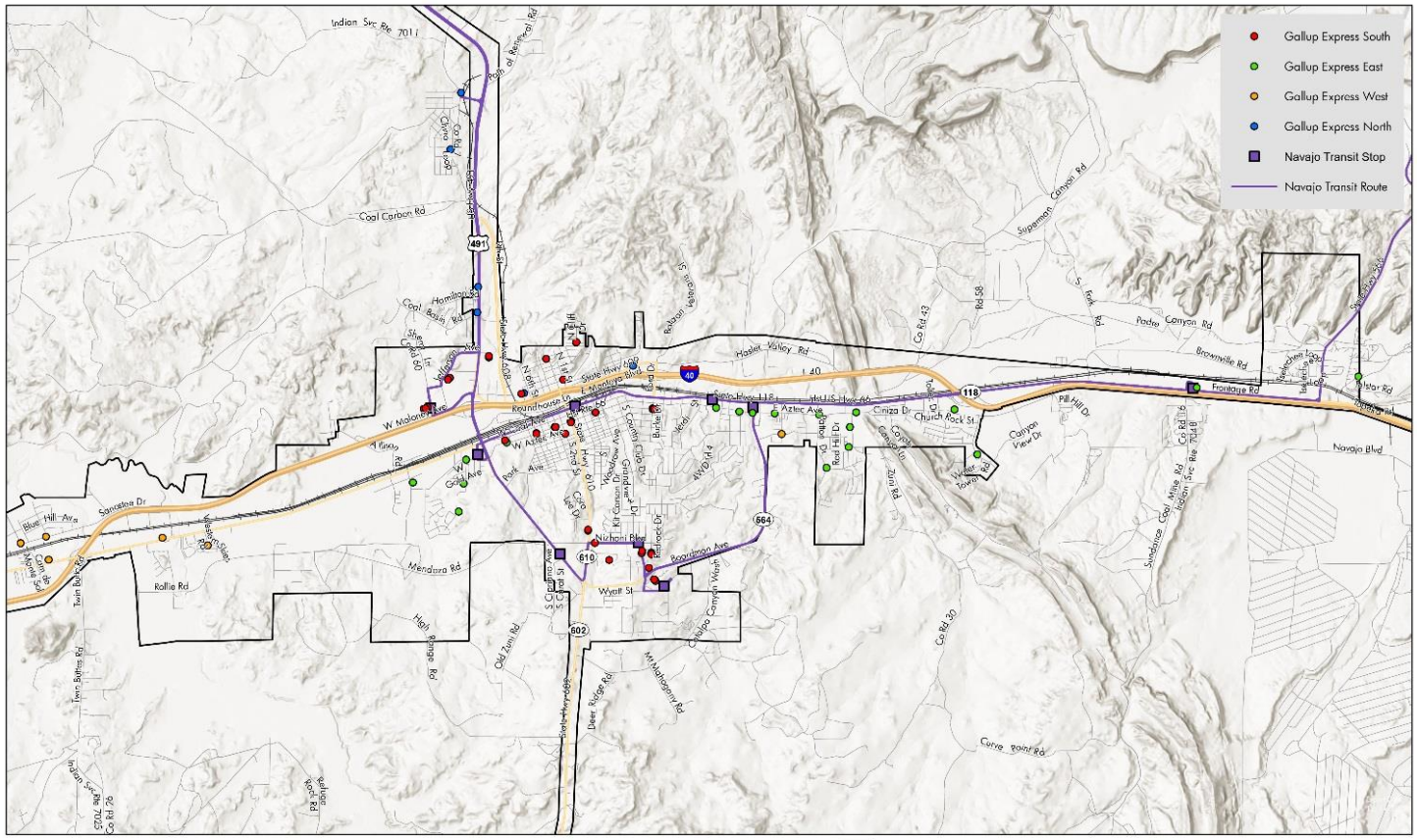


Figure 24 | Gallup Area Bus Stop Locations

The Navajo Transit System operates regular weekday service from Monday through Friday (not all Navajo Transit Routes operate Monday through Friday). Of the 18 routes, three serve Gallup: Route 5, Route 6, and Route 13. These three route stops serve as transfer points with Gallup Express routes. These bus stops are Gallup—Walmart, Gallup—Fire Rock Casino, and Gallup—UNM Campus.

3 Safety Assessment

3.1 Crash Data

The project team used crash data spanning five years for the safety assessment (from 2012 to 2016). The University of New Mexico (UNM), Geospatial and Population Studies, Traffic Research Unit (TRU) (https://gps.unm.edu/tru) provided the crash data. The study area, or *crash boundary* (Figure 25), generally follows Gallup's city limits boundary; however, the study team expanded the crash boundary in order to understand crashes on corridors that extend beyond city limits.

In order to identify opportunities for safety improvements, the project team mapped and tabulated each crash in the study area from 2012 to 2016. Additionally, the project team developed 2D and 3D crash density maps to understand where crashes occur most frequently.

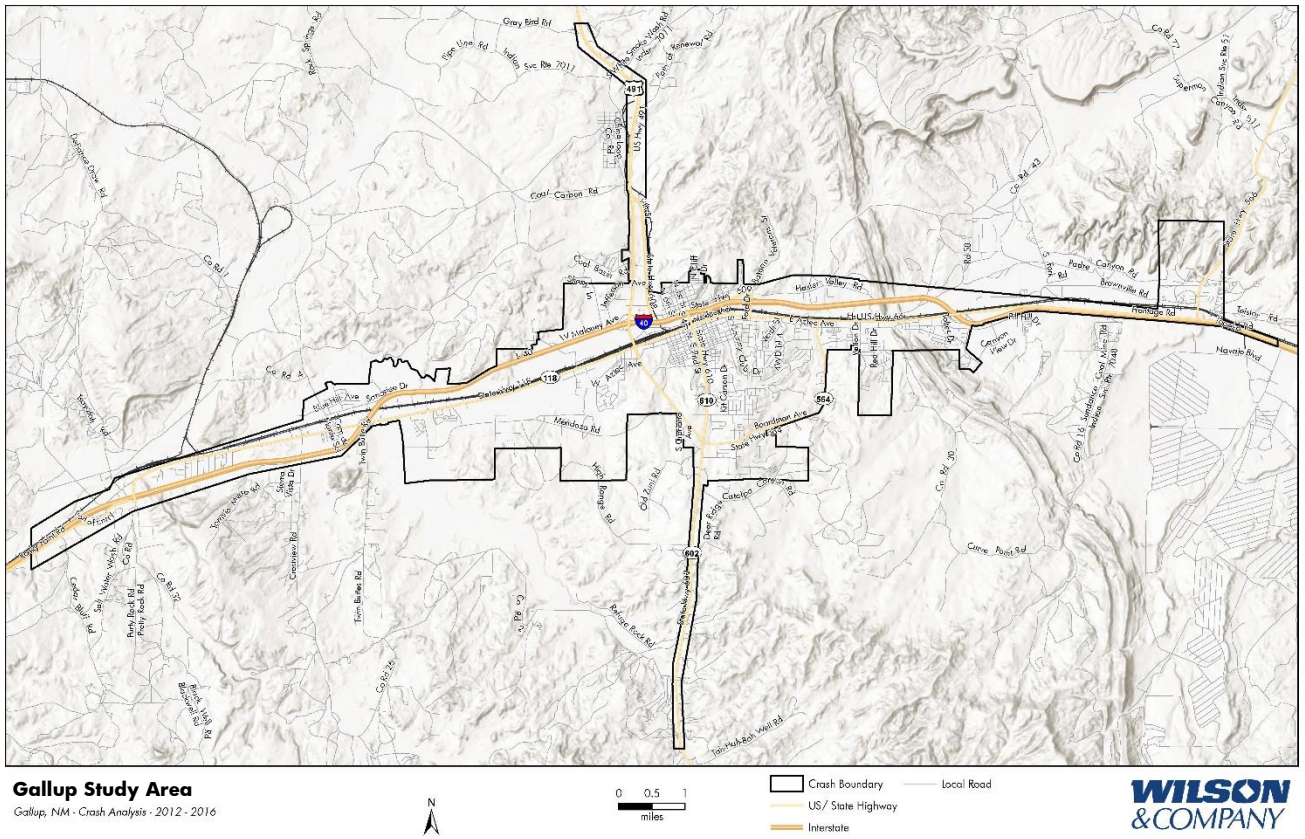


Figure 25 | Crash Study Area Map

Table 3 summarizes the 2012 to 2016 crash data by the following factors:

- **Crash severity**—dictated by the most severe result to human life. If no one was injured, the crash severity is considered property damage only (PDO). For planning purposes, fatal and serious injury crashes (injuries that result in emergency medical transport) are the basis of analysis, however other minor injury and PDO crash severity types were included in this plan as a point of comparison;
- **Crash classification**—generally indicates the involvement of other vehicles, persons, or objects; and
- **Highest contributing crash factor**—represents the highest contributing behavior that preceded the crash incident.

3.2 All Crash Summary

Between 2012 and 2016, a total of 4,108 crashes occurred in the study area (Table 3). Of this *All Crash Total,* 73.7% resulted in property damage only, 22.9% resulted in a non-emergency response or "other" kind of injury, 2.3% resulted in serious injury and 1.1% were fatal (Figure 26). This plan focuses on the combined 3.4% of total crashes considered severe (crashes with a fatality or serious life threatening injury).

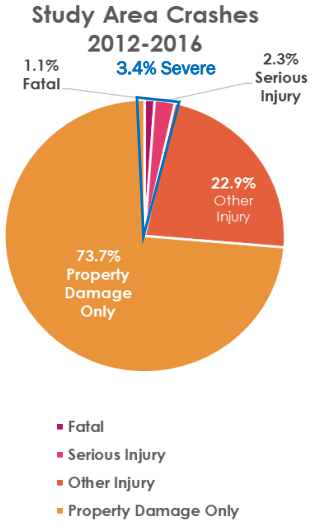


Figure 26 | Crash Severity Chart

Table 3 | Study Area Crash Summary (2012–2016)

Total		Fatal Crashes		Serious Injury Crashes		Sub-Total (Fatal + Serious Injury)		Other Injury Crashes		Property Damage Only Crashes		Grand Total	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
	All Crash Totals	*47*	*100%*	*95*	*100%*	*142*	*100%*	*940*	*100%*	*3026*	*100%*	*4108*	*100%*

Crash Classification		Fatal Crashes		Serious Injury Crashes		Sub-Total (Fatal + Serious Injury)		Other Injury Crashes		Property Damage Only Crashes		Grand Total	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
	Animal	0	0.0%	0	0.0%	0	0.0%	10	1.1%	49	1.6%	59	1.4%
	Fixed Object	5	10.6%	9	9.5%	14	9.9%	75	8.0%	307	10.1%	396	9.6%
	Invalid Code	0	0.0%	0	0.0%	0	0.0%	1	0.1%	1	0.0%	2	0.0%
	Left Blank	0	0.0%	0	0.0%	0	0.0%	7	0.7%	44	1.5%	51	1.2%
	Other (Non-Collision)	1	2.1%	4	4.2%	5	3.5%	13	1.4%	59	1.9%	77	1.9%
	Other (Object)	0	0.0%	0	0.0%	0	0.0%	12	1.3%	79	2.6%	91	2.2%
	Other Vehicle	8	17.0%	45	47.4%	53	37.3%	690	73.4%	2129	70.4%	2872	69.9%
	Overturn/Rollover	4	8.5%	4	4.2%	8	5.6%	35	3.7%	43	1.4%	86	2.1%
	Parked Vehicle	0	0.0%	1	1.1%	1	0.7%	13	1.4%	264	8.7%	278	6.8%
	Pedalcyclist	0	0.0%	1	1.1%	1	0.7%	12	1.3%	8	0.3%	21	0.5%
	Pedestrian	26	55.3%	27	28.4%	53	37.3%	60	6.4%	10	0.3%	123	3.0%
	Railroad Train	0	0.0%	1	1.1%	1	0.7%	2	0.2%	0	0.0%	3	0.1%
	Rollover	3	6.4%	2	2.1%	5	3.5%	7	0.7%	6	0.2%	18	0.4%
	Vehicle on Other Road	0	0.0%	1	1.1%	1	0.7%	3	0.3%	27	0.9%	31	0.8%
	All Crash Totals	47	100%	95	100%	142	100%	940	100%	3026	100%	4108	100%

Highest Contributing Crash Factor		Fatal Crashes		Serious Injury Crashes		Sub-Total (Fatal + Serious Injury)		Other Injury Crashes		Property Damage Only Crashes		Grand Total	
		Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
	Alcohol/Drug Involved	31	66.0%	32	33.7%	63	44.4%	169	18.0%	257	8.5%	489	11.9%
	Avoid No Contact - Other	0	0.0%	0	0.0%	0	0.0%	5	0.5%	15	0.5%	20	0.5%
	Avoid No Contact - Vehicle	0	0.0%	0	0.0%	0	0.0%	4	0.4%	52	1.7%	56	1.4%
	Defective Steering	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.1%	2	0.0%
	Defective Tires	0	0.0%	0	0.0%	0	0.0%	1	0.1%	11	0.4%	12	0.3%
	Disregarded Traffic Signal	0	0.0%	4	4.2%	4	2.8%	56	6.0%	87	2.9%	147	3.6%
	Driver Inattention	3	6.4%	9	9.5%	12	8.5%	142	15.1%	545	18.0%	699	17.0%
	Driverless Moving Vehicle	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	0.1%	3	0.1%
	Drove Left Of Center	2	4.3%	2	2.1%	4	2.8%	8	0.9%	41	1.4%	53	1.3%
	Excessive Speed	1	2.1%	6	6.3%	7	4.9%	48	5.1%	120	4.0%	175	4.3%
	Failed to Yield Right of Way	2	4.3%	14	14.7%	16	11.3%	160	17.0%	392	13.0%	568	13.8%
	Following Too Closely	0	0.0%	3	3.2%	3	2.1%	112	11.9%	350	11.6%	465	11.3%
	Improper Backing	0	0.0%	0	0.0%	0	0.0%	2	0.2%	167	5.5%	169	4.1%
	Improper Lane Change	0	0.0%	0	0.0%	0	0.0%	13	1.4%	82	2.7%	95	2.3%
	Improper Overtaking	0	0.0%	0	0.0%	0	0.0%	9	1.0%	45	1.5%	54	1.3%
	Inadequate Brakes	0	0.0%	1	1.1%	1	0.7%	3	0.3%	13	0.4%	17	0.4%
	Made Improper Turn	0	0.0%	3	3.2%	3	2.1%	42	4.5%	183	6.0%	228	5.6%
	None	0	0.0%	2	2.1%	2	1.4%	30	3.2%	168	5.6%	200	4.9%
	Missing Data	2	4.3%	0	0.0%	2	1.4%	13	1.4%	50	1.7%	65	1.6%
	Other - No Driver Error	0	0.0%	7	7.4%	7	4.9%	28	3.0%	116	3.8%	151	3.7%
	Other Improper Driving	0	0.0%	2	2.1%	2	1.4%	21	2.2%	72	2.4%	95	2.3%
	Other Mechanical Defect	1	2.1%	0	0.0%	1	0.7%	12	1.3%	46	1.5%	59	1.4%
	Passed Stop Sign	0	0.0%	1	1.1%	1	0.7%	15	1.6%	55	1.8%	71	1.7%
	Pedestrian Error	3	6.4%	4	4.2%	7	4.9%	13	1.4%	4	0.1%	24	0.6%
	Road Defect	0	0.0%	1	1.1%	1	0.7%	1	0.1%	21	0.7%	23	0.6%
	Speed Too Fast for Conditions	2	4.3%	4	4.2%	6	4.2%	32	3.4%	121	4.0%	159	3.9%
	Traffic Control Not Functioning	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	0.1%	3	0.1%
	Vehicle Skidded Before Brake	0	0.0%	0	0.0%	0	0.0%	1	0.1%	5	0.2%	6	0.1%
	All Crash Totals	47	100%	95	100%	142	100%	940	100%	3026	100%	4108	100%

**Note: Crash data from the University of New Mexico **Note: Numbers down the rows add to 100% of crashes per each Crash Classification, and Highest Contributing Crash Factors section*

When a police officer completes a crash report, they must select one crash classification; however the officer may select multiple contributing crash factors per crash.[2] It is only when crash data is aggregated that the highest contributing crash factor per crash is hierarchically derived.[3] For example, in a crash with a factor of alcohol involvement and exessive speed, only alcohol/drug involved would display in the data received from UNM. A full summary of crash data tables is available in Appendix A of this document. Figure 27 displays the relative crash density of all crashes from 2012 to 2016.

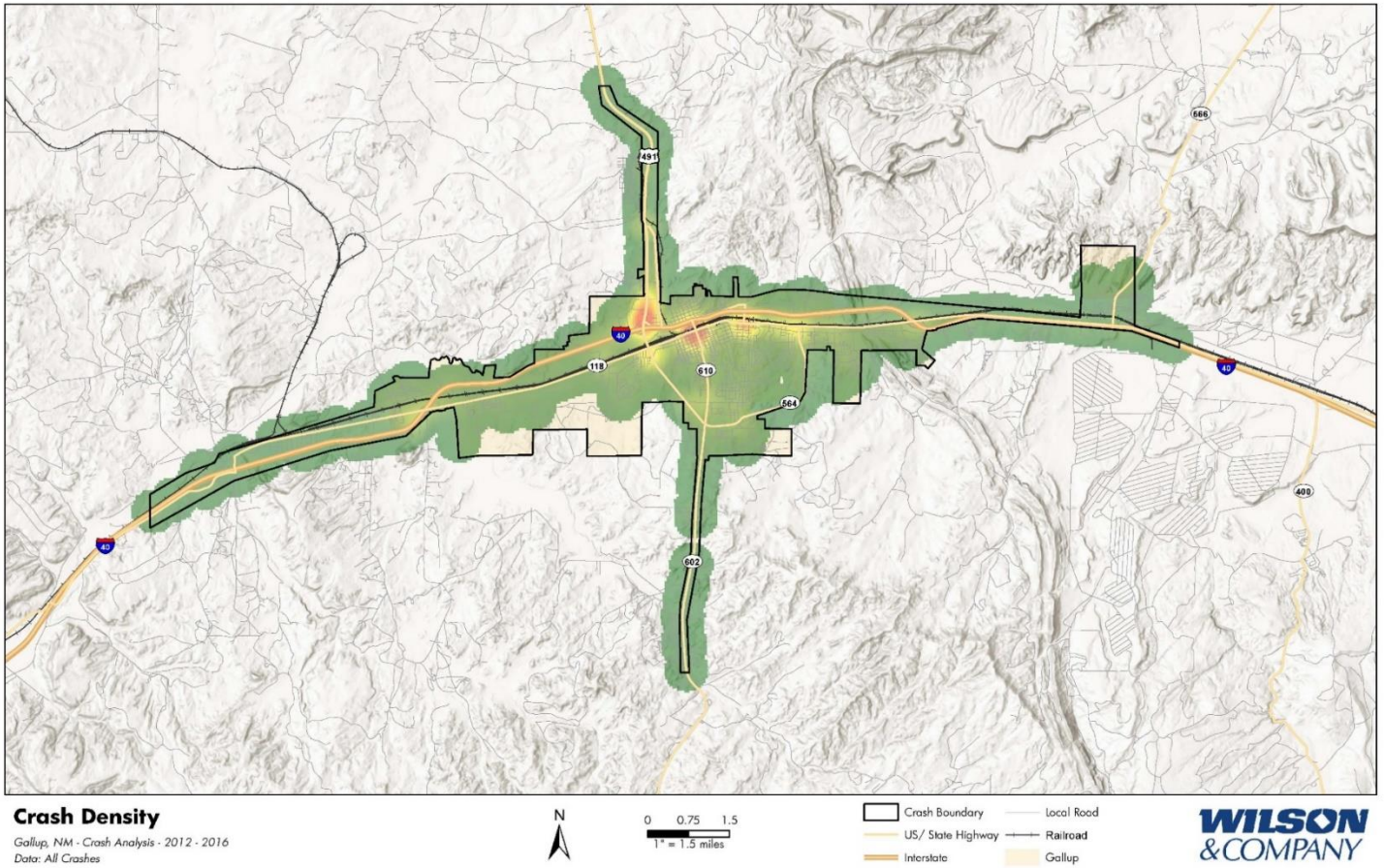


Figure 27 | All Crash Density Heat Map

[2] New Mexico Department of Transportation, "New Mexico Uniform Crash Report Instruction Manual," updated September 2009, available at http://nmtrafficrecords.com/resources/new-mexico-uniform-crash-report/ (accessed May 9, 2019).
[3] UNM, New Mexico Traffic Crash Database, "Crash-level Data Dictionary and User's Guide," 2019, available at https://gps.unm.edu/tru/dictionary (accessed May 9, 2019).

3.3 Fatal and Serious Injury Crashes

Fatal and serious injury crashes are considered severe crashes and account for 3.4% of total crashes (from 2012 to 2016) in the study area. Many of these severe crashes occurred along higher volume corridors such as US 491, I-40, and Route 66/NM 118 (Figure 28). As previsouly stated, alcohol/drug involvement is the leading contributing factor to severe crashes in the study area at 66% of fatal crashes and 33% of serious injury crashes.

The 26 pedestrian crashes in the study area account for the highest number of fatal crashes of any crash classification. The highest contributing crash factor in fatal crashes is alcohol/drug involvement—which represents two-thirds of all fatal crashes, and one-third of serious injury crashes. Additionally, driver inattention and failure to yield right-of-way are high contributing crash factors in fatal and serious injury crashes. A full summary of crash maps are available in Appendix B of this document.

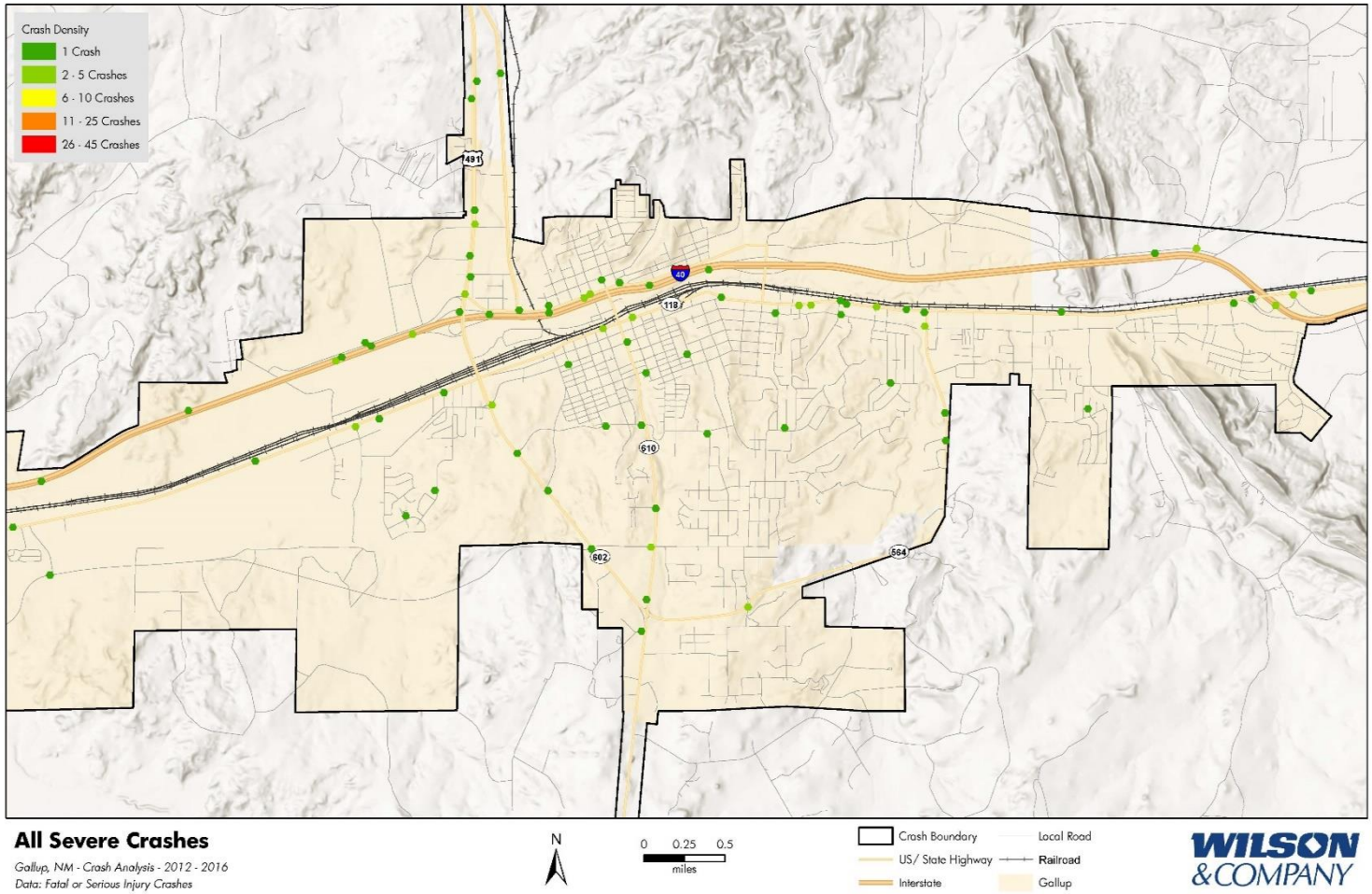


Figure 28 | Fatal and Serious Injury Crash Density

3.4 Pedestrian-Related Crashes

Over half (55 percent) of the fatal crashes (from 2012 to 2016) in the study area involved a pedestrian. Nearly half of these fatal pedestrian crashes occurred on I-40, west of the US 491 interchange where pedestrian traffic is not permitted (Figure 29). Fencing is installed to prohibit crossing; however, it is cut for access in several locations.

Figure 29 | I-40 Pedestrian-Related Crashes

Furthermore, there were an additional 32 pedestrian-involved crashes over the last 40 years at the 2nd Street/NM 610 and 3rd Street railroad crossings (see Table 4). Most recently, a pedestrian died at the 2nd Street crossing in December of 2017. NMDOT conducted an RSA to specifically evaluate the 2nd Street/NM 610 and 3rd Street corridors, particularly the BNSF rail crossings.

3.5 Bicycle-Related Crashes

There were 21 crashes in the study area involving a bicyclist and motor vehicle. Although none of these crashes were fatal, 13 resulted in an injury. The majority of these crashes occurred in the downtown Gallup area (centered on the intersection of Route 66/NM 118 and NM 610).

3.6 Railway-Related Crashes

Vehicular crash data provided by UNM indicates three railway-related crashes between 2012 and 2016—one serious injury and two other injury crashes. However, a separate dataset maintained by the Federal Railway Administration (FRA) Office of Safety Analysis indicates that from 1977 to 2017 there were 61 recorded crashes at four at-grade rail crossings north of Route 66/NM 118.

Train-Pedestrian Crashes

Table 4 displays the FRA train crash data summary for pedestrian involved crashes between 1977 and 2017. There were seven fatalities at the 2nd Street/NM 610 and six fatalities at the 3rd Street crossings. These crossings have gates that prevent vehicles from crossing during a train crossing; however, the gates do not block pedestrians or bicyclists, who can maneuver around the gates (Figure 30).

Table 4 | Train-Pedestrian Crashes (1977–2017)

Train-Pedestrian Crashes				
	2nd St/NM 610	3rd Street	Allison Rd	Mentmore Rd
Fatality	7	6	1	0
Non-Fatal Injury	7	11	0	2
No Injury Reported	1	0	0	0
Total	***15***	***17***	***1***	***2***

Train-Vehicle Crashes

Vehicle-to-train crashes are less common at the 2nd Street/NM 610 and 3rd Street crossings, but, as Table 5 indicates, there have been three fatal and five injury crashes at the Allison Road crossing during the analysis time period.

Table 5 | Train-Vehicle Crashes (1977–2017)

Train-Vehicle Crashes				
	2nd St/NM 610	3rd Street	Allison Rd	Mentmore Rd
Fatality	0	0	3	1
Non-Fatal Injury	0	3	5	2
No Injury Reported	2	6	4	0
Total	***2***	***9***	***12***	***3***

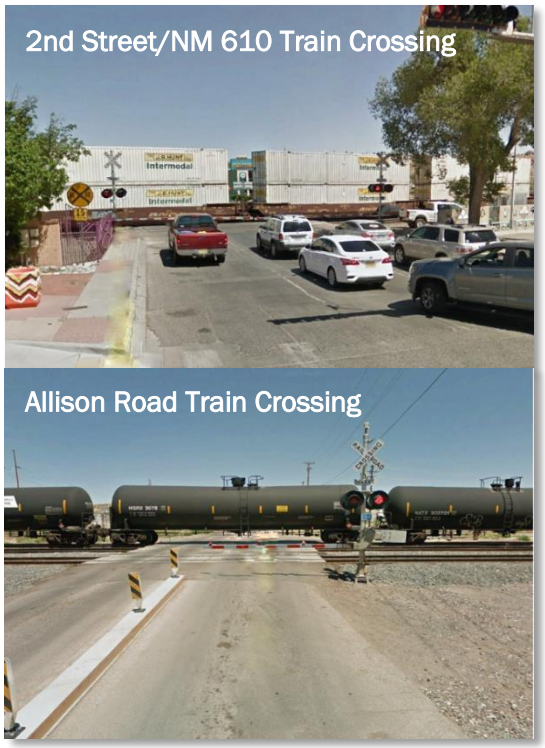


Figure 30 | Gallup Train Crossings

3.7 Crashes by Functional Classification

Two-thirds (66%) of the 2012–2016 crashes involving serious injuries and fatalities occurred on principal arterials; however, principal arterials represent 13% of the total roadways in the study area (Figure 31). Alternatively, local roads, which represent 62% of roadways, account for 5% of the serious injuries and fatalities in the study area. This means that there are 58 times as many crashes involving injuries and fatalities per mile on principal arterials than on local roads.

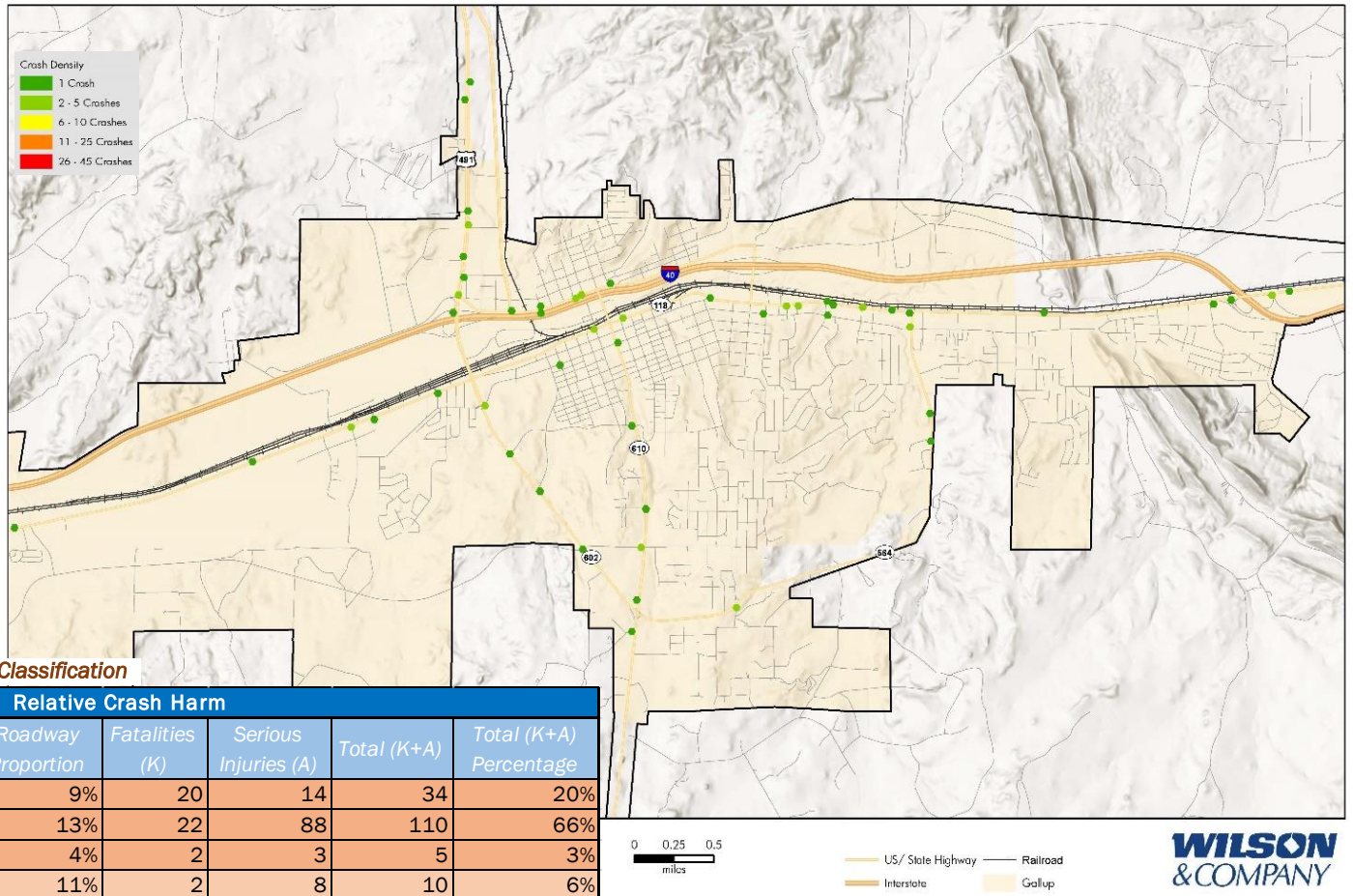


Figure 31 | Principal Arterial Severe Crashes

Table 6 | Crash Harm by Functional Classification

Relative Crash Harm						
	Miles	*Roadway Proportion*	*Fatalities (K)*	*Serious Injuries (A)*	*Total (K+A)*	*Total (K+A) Percentage*
Interstate	26	9%	20	14	34	20%
Principal Arterial	39.4	13%	22	88	110	66%
Minor Arterial	12.9	4%	2	3	5	3%
Major Collector	33.5	11%	2	8	10	6%
Minor Collector	2.5	1%	0	0	0	0%
Local Road	187.6	62%	4	5	9	5%
Total	***301.8***	***100%***	***50***	***118***	***168***	***100%***

Table 6 summarizes crashes by *Functional Classification,* which classifies roads by the range of mobility versus access functions that roadways serve, and by *relative crash harm,* which relates the proportion of fatalities and serious injuries relative to the functional classification of the roadway. Interstates represent a high level of relative crash harm and have the highest rate of fatalities per mile. Fatal crashes on I-40 tend to be located near interchanges, with the highest fatality rates occurring west of US 491 where pedestrians illegally cross the interstate.

3.8 Identification of High-Crash Areas

Crash analyses ultimately led to the identification of six high-crash focus areas (Figure 32) by the project team. Each of these focus areas have unique challenges in reducing the most severe crashes (fatal and serious injury). Table 7 displays the crash count and percentage of total crashes per focus area by level of crash severity. PDO and other injury crashes are also included in the summary.

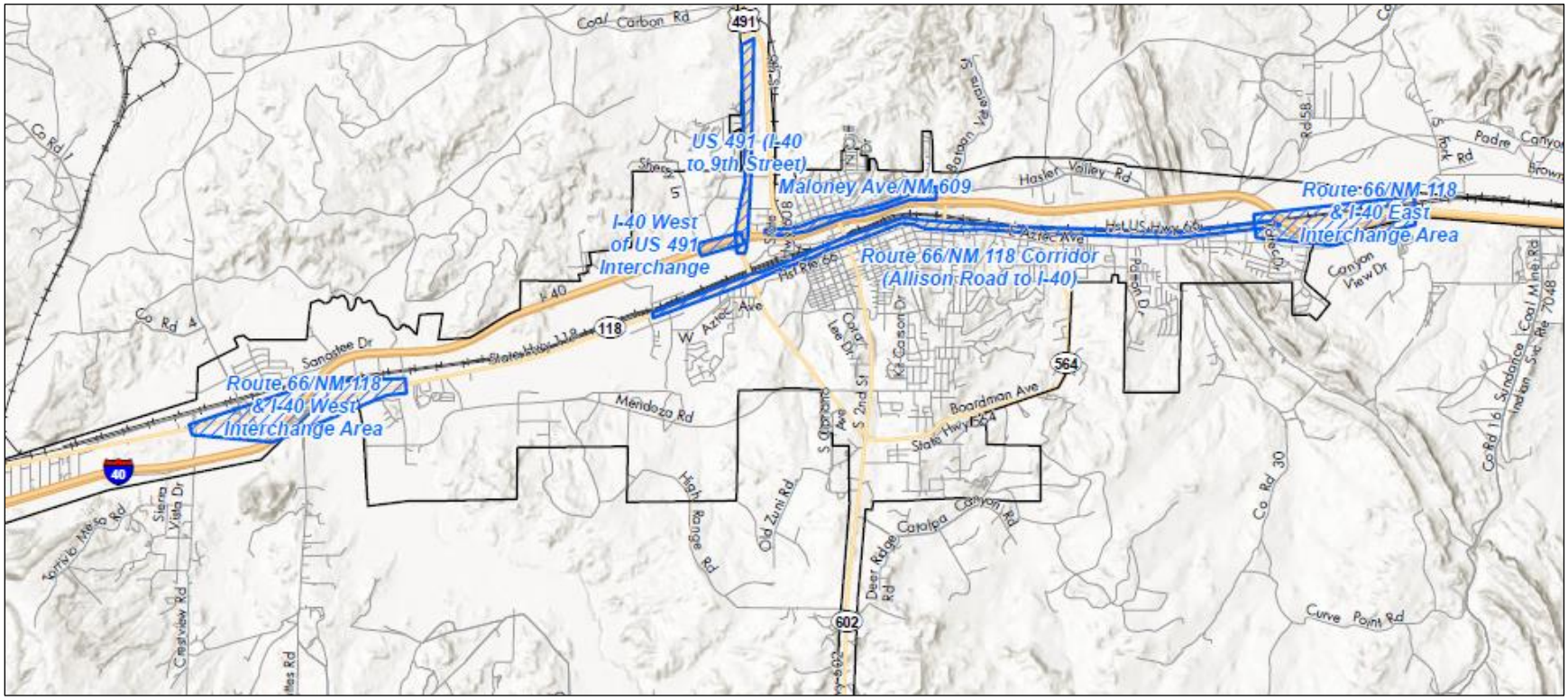


Figure 32 | Focus Areas Locations

Table 7 | Focus Area Crash Summary

	Route 66/NM 118 Corridor (Allison Road to I-40)		Route 66/NM 118 & I-40 East Interchange		Route 66/NM 118 & I-40 West Interchange		I-40 West of US 491 Interchange		US 491 (I-40 to 9th Street)		Maloney Ave/NM 609	
	Count	*Percentage*	*Count*	*Percentage*	*Count*	*Percentage*	*Count*	*Percentage*	*Count*	*Percentage*	*Count*	*Percentage*
Fatal Crash	2	0%	3	5%	3	2%	8	80%	3	0%	0	0%
Serious Injury Crash	22	3%	2	4%	2	1%	2	20%	13	2%	8	5%
PDO & Other Injury Crash	728	97%	49	91%	157	97%	0	0%	639	98%	142	95%
Total	***752***	***100%***	***54***	***100%***	***162***	***100%***	***10***	***100%***	***655***	***100%***	***150***	***100%***

3.8.1 Route 66/NM 118 Corridor (Allison Road to I-40)

Crash Summary

This focus area includes a six-mile portion of Route 66/NM 118 between Allison Road and the easternmost I-40 interchange. In Tables 8 through 13, *All Crash Totals* refers to all crashes in the study area from 2012 to 2016. In this time period, there was a total of two fatal crashes and 22 serious injury crashes on this portion of Route 66/NM 118. There were nine severe pedestrian crashes (fatal and serious injury crashes) in this focus area, one of which was a fatal crash. Alcohol/drug involvement was the highest contributing crash factor for 33% of severe crashes. Failure to yield right-of-way was the highest contributing crash factor for over 20% of severe crashes.

Table 8 | Route 66/NM 118 Crash Summary (2012–2016)

Total	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Route 66/NM 118 Crash Totals	*2*	*100%*	*22*	*100%*	*24*	*100%*
All Crash Totals	*47*	*100%*	*95*	*100%*	*142*	*100%*

Crash Classification	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Fixed Object	1	50.0%	2	9.1%	3	12.5%
Other (Non-Collision)	0	0.0%	2	9.1%	2	8.3%
Other Vehicle	0	0.0%	9	40.9%	9	37.5%
Pedestrian	1	50.0%	8	36.4%	9	37.5%
Railroad Train	0	0.0%	1	4.5%	1	4.2%
Route 66/NM 118 Crash Totals	2	100%	22	100%	24	100%

Highest Contributing Crash Factor	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Alcohol/Drug Involved	2	100.0%	6	27.3%	8	33.3%
Disregarded Traffic Signal	0	0.0%	2	9.1%	2	8.3%
Driver Inattention	0	0.0%	3	13.6%	3	12.5%
Excessive Speed	0	0.0%	1	4.5%	1	4.2%
Failed to Yield Right of Way	0	0.0%	5	22.7%	5	20.8%
Following Too Closely	0	0.0%	1	4.5%	1	4.2%
None	0	0.0%	1	4.5%	1	4.2%
Pedestrian Error	0	0.0%	3	13.6%	3	12.5%
Route 66/NM 118 Crash Totals	2	100%	22	100%	24	100%

**Note: Crash data from the University of New Mexico **Note: Numbers down the rows add to 100% of crashes per each Crash Classification, and Highest Contributing Crash Factors section*

Photo Inventory

Figure 33 displays the intersection of Route 66/NM 118 and 3rd Street looking east. This portion of Route 66/NM 118 is located in the downtown Gallup area. There is a mix of land uses in this area with walkable commercial retail on the south and the BNSF railway to the north. These land uses continue east up to Ford Drive. Along this section, Route 66/NM 118 is four-lane road separated by a raised median with on-street parking on the south side of the roadway. Figure 34 displays the intersection of Route 66/NM 118 and Ford Drive looking east. The land uses along

this section of Route 66/NM 118 are generally auto-centric commercial retail, characterized by large parking lots adjacent to the roadway. This type of development generally continues east toward the east I-40 interchange.

Figure 33 | Route 66/NM 118 at 3rd St View East

Figure 34 | Route 66/NM 118 at Ford Dr View East

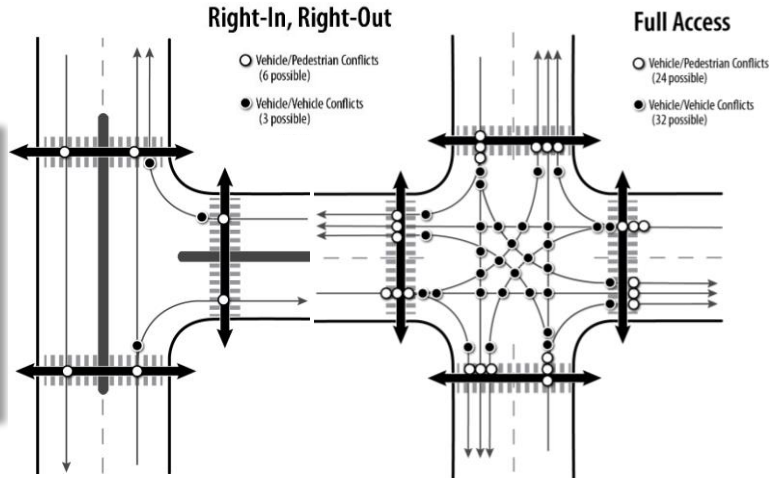


Figure 35 | Conflict Points Diagram

Route 66/NM 118 Driveway Evaluation

The NMDOT *New Mexico State Access Management Manual* (SAMM) dictates that for roads such as Route 66/NM 118 (urban principal arterials with a traversable median), driveways should be located no more than one per 200 feet when the road is 30 miles per hour (mph) or less; the spacing requirement increases to a maximum of 625 feet when the roadway speed equals or exceeds 55 mph. Most of Route 66/ NM 118 corridor is considered "Full Access," where opposing traffic can make turn movements to or from driveways without any restrictions. Figure 35 illustrates and summarizes the number of conflict points (locations where vehicle/vehicle or vehicle/pedestrian paths cross) for full access and median separated roadways. As shown, when a full access intersection is compared with a right-in/right-out intersection, there is a 91% decrease in vehicle/vehicle conflict points and a 75% reduction in vehicle/pedestrian conflict points. Figure 36 displays the density of driveways per 200 feet of roadway along the Route 66/NM 118 corridor between NM 602/US 491 and Boardman Drive/NM 564. Over half of the corridor has two to six times the amount of driveways per 200 feet than is specified in the SAMM. Reducing the number of driveways along the corridor, through consolidations or other means, would in turn reduce the number of conflict points.

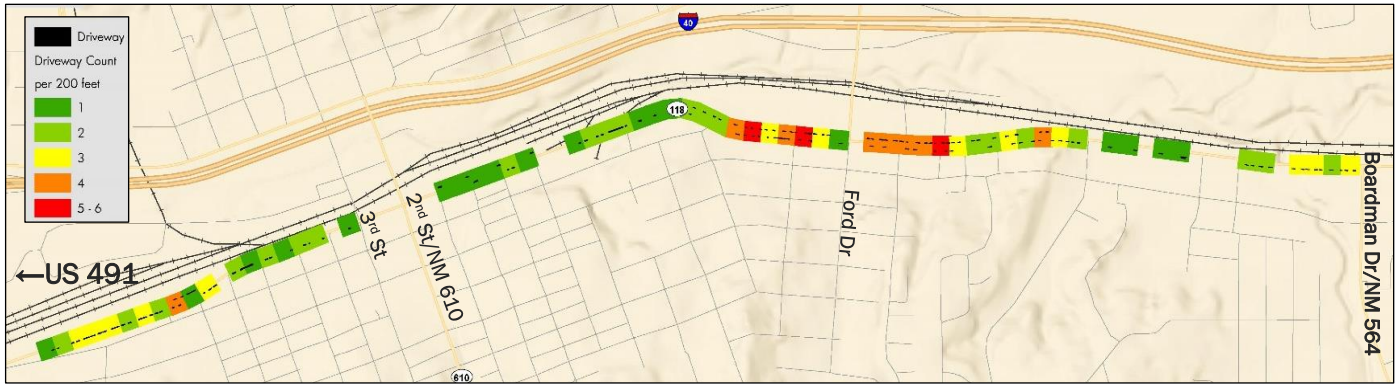


Figure 36 | Route 66/NM 118 Driveway Density per 200 Feet

3.8.2 Route 66/NM 118 & I-40 East Interchange Area

Crash Summary

This focus area is located at the eastern Route 66/NM 118 and I-40 interchange. Between 2012 and 2016, there was a total of three fatal crashes and two serious injury crashes in this focus area (Table 9). There were four severe pedestrian crashes (fatal and serious injury crashes) in this focus area, two of which were fatal crashes. Alcohol/drug involvement was the highest contributing crash factor for 60% of severe crashes.

Table 9 | Route 66/NM 118 & I-40 East Crash Summary (2012–2016)

Total	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Route 66/NM 118 & I-40 East Crash Totals	*3*	*100%*	*2*	*100%*	*5*	*100%*
All Crash Totals	*47*	*100%*	*95*	*100%*	*142*	*100%*

Crash Classification	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Other Vehicle	1	33.3%	0	0.0%	1	20.0%
Pedestrian	2	66.7%	2	100.0%	4	80.0%
Route 66/NM 118 & I-40 East Crash Totals	3	100%	2	100%	5	100%

Highest Contributing Crash Factor	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Alcohol/Drug Involved	3	100.0%	0	0.0%	3	60.0%
Other Improper Driving	0	0.0%	1	50.0%	1	20.0%
Pedestrian Error	0	0.0%	1	50.0%	1	20.0%
Route 66/NM 118 & I-40 East Crash Totals	3	100%	2	100%	5	100%

**Note: Crash data from the University of New Mexico **Note: Numbers down the rows add to 100% of crashes per each Crash Classification, and Highest Contributing Crash Factors section*

Photo Inventory

Figure 37 displays Route 66/NM 118 at the southbound I-40 off-ramp facing east. The image depicts two lanes of eastbound traffic and a wide painted shoulder. Figure 38 displays Route 66/NM 118 at the northbound I-40 off-ramp facing east. The image depicts two through lanes of eastbound traffic, an off-ramp lane, and a painted shoulder.

Figure 37 | Route 66/NM 118 at southbound I-40 off-ramp

Figure 38 | Route 66/NM 118 at northbound I-40 off-ramp

3.8.3 Route 66/NM 118 & I-40 West Interchange Area

Crash Summary

This focus area is located at the western Route 66/NM 118 and I-40 interchange. Between 2012 and 2016, there were three fatal crashes and two serious injury crashes in this area (Table 10). There were two pedestrian crashes in this focus area, both of which were fatal. Alcohol/drug involvement was the highest contributing crash factor for 80% of severe crashes in this focus area.

Photo Inventory

Figure 39 displays the intersection of Route 66/NM 118 and Mentmore Drive looking east. Route 66/NM 118 transitions from a 3-lane section to a 5-lane section heading east past Mentmore Drive. Figure 40 displays the section of Route 66/NM 118 just east of the west I-40 and Route 66/NM 118 interchange.

Table 10 | Route 66/NM 118 & I-40 West Crash Summary (2012–2016)

Total	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Route 66/NM 118 & I-40 West Crash Totals	*3*	*100%*	*2*	*100%*	*5*	*100%*
All Crash Totals	*47*	*100%*	*95*	*100%*	*142*	*100%*

Crash Classification	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Other Vehicle	0	0.0%	2	100.0%	2	40.0%
Pedestrian	3	100.0%	0	0.0%	3	60.0%
Route 66/NM 118 & I-40 West Crash Totals	3	100%	2	100%	5	100%

Highest Contributing Crash	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Alcohol/Drug Involved	3	100.0%	1	50.0%	4	80.0%
Failed to Yield Right of Way	0	0.0%	1	50.0%	1	20.0%
Route 66/NM 118 & I-40 West Crash Totals	3	100%	2	100%	5	100%

**Note: Crash data from the University of New Mexico **Note: Numbers down the rows add to 100% of crashes per each Crash Classification, and Highest Contributing Crash Factors section*

Figure 39 | Route 66/NM 118 at Mentmore Drive View East

Figure 40 | Route 66/NM 118 East of I-40 View East

3.8.4 I-40 West of US 491 Interchange

Crash Summary

This focus area is located on I-40 immediately west of the US 491 interchange. Between 2012 and 2016, there were eight fatal crashes and two serious injury crashes in this area (Table 11). All 10 of the severe crashes in this focus area involved pedestrians, 8 of which were fatal. Alcohol/drug involvement was the highest contributing crash factor for 70% of severe crashes. Pedestrian-related crashes in this location are discussed in detail in section 3.4 of this plan.

Table 11 | I-40 West of US 491 Crash Summary (2012–2016)

Total	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
I-40 West of US 491 Crash Totals	*8*	*100%*	*2*	*100%*	*10*	*100%*
All Crash Totals	*47*	*100%*	*95*	*100%*	*142*	*100%*

Crash Classification	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Pedestrian	8	100.0%	2	100.0%	10	100.0%
I-40 West of US 491 Crash Totals	8	100%	2	0%	10	100%

Highest Contributing Crash Factor	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Alcohol/Drug Involved	5	62.5%	2	100.0%	7	70.0%
Drove Left Of Center	1	12.5%	0	0.0%	1	10.0%
Missing Data	1	12.5%	0	0.0%	1	10.0%
Pedestrian Error	1	12.5%	0	0.0%	1	10.0%
I-40 West of US 491 Crash Totals	8	100%	2	0%	10	100%

**Note: Crash data from the University of New Mexico **Note: Numbers down the rows add to 100% of crashes per each Crash Classification, and Highest Contributing Crash Factors section*

Photo Inventory

Figure 41 displays I-40 east of US 491 looking north towards Walmart. Figure 42 shows I-40 east of US 491 viewing south toward the 9.8-MW solar farm. Both Figures 41 and 42 depict the locations where pedestrians cross over I-40, resulting in the 10 severe pedestrian crashes between 2012 and 2016.

Figure 41 | I-40 west of US 491 View North

Figure 42 | I-40 West of US 491 View South

3.8.5 US 491 (I-40 Interchange to 9th Street)

Crash Summary

This focus area is located along US 491 from the I-40 interchange north to 9th Street. Between 2012 and 2016, there was a total of three fatal crashes and 13 serious injury crashes in this area (Table 12). There were nine severe pedestrian crashes (fatal and injury crash) in this focus area, three of which were fatal. Alcohol/drug involvement was the highest contributing crash factor for over 60 percent of severe crashes.

Table 12 | US 491 (I-40 to 9th Street) Crash Summary (2012 –2016)

Total

	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
US 491 Crash Totals	*3*	*100%*	*13*	*100%*	*16*	*100%*
All Crash Totals	*47*	*100%*	*95*	*100%*	*142*	*100%*

Crash Classification

	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Fixed Object	0	0.0%	2	15.4%	2	12.5%
Other Vehicle	0	0.0%	5	38.5%	5	31.3%
Pedestrian	3	100.0%	6	46.2%	9	56.3%
US 491 Crash Totals	3	100%	13	100%	16	100%

Highest Contributing Crash Factor

	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Alcohol/Drug Involved	3	100.0%	7	53.8%	10	62.5%
Driver Inattention	0	0.0%	2	15.4%	2	12.5%
Failed to Yield Right of Way	0	0.0%	1	7.7%	1	6.3%
Made Improper Turn	0	0.0%	1	7.7%	1	6.3%
None	0	0.0%	1	7.7%	1	6.3%
Other - No Driver Error	0	0.0%	1	7.7%	1	6.3%
US 491 Crash Totals	3	100%	13	100%	16	100%

**Note: Crash data from the University of New Mexico **Note: Numbers down the rows add to 100% of crashes per each Crash Classification, and Highest Contributing Crash Factors section*

Photo Inventory

Figure 43 displays the intersection of US 491 and Metro Avenue viewing north. The image depicts a dedicated left-turn lane separated from through-traffic with a painted buffer, three northbound through-lanes, and a right-turn lane. The surrounding area contains large-scale commercial development. Figure 44 displays US 491 south of Hamilton Road viewing north and depicts a solid median with an abutting acceleration lane shown tapering into the left through-lane. Additionally, there is a right-turn auxiliary lane that merges left into the right through-lane.

Figure 43 | US 491 View North from Metro Avenue

Figure 44 | US 491 View North from Hamilton Road

US 491 Driveway Density

For roads such as US 491 (urban principal arterials with a non-traversable median that allows partial access), the New Mexico SAMM dictates that driveways must be located no more than one per 200 feet when the road is 30 MPH or less; this spacing distance increases to a minimum separation of 625 feet when the roadway speed equals or exceeds 55 mph. Additionally, full-access breaks in the median must not be located any less than once per quarter mile of median-separated roadway. Figure 45 displays the density of driveways per 200 feet of roadway along the US 491 corridor between NM 609/Maloney Avenue and north to the intersection of US 491 and 9th street. Between Jefferson Avenue and Coal Basin Road, the US 491 corridor generally has two times the number of driveways than is specified in the SAMM for a roadway with these characteristics. Additionally, there are several locations where full-access breaks in the median are located less than once per quarter mile. Reducing the number of driveways, through consolidations or other means, would in turn reduce the number of conflict points along the roadway.

Figure 45 | US 491 Driveway Density per 200 Feet

3.8.6 Maloney Avenue/NM 609

Crash Summary

This focus area is located along Maloney Avenue/NM 609 from US 491 to Ford Drive. Between 2012 and 2016, there was a total of eight serious injury crashes in this area (Table 13). There were four severe pedestrian crashes in this focus area. Alcohol/drug involvement was the highest contributing crash factor for over 60% of severe crashes.

Table 13 | Maloney Avenue/NM 609 (US 491 to Ford Avenue) Crash Summary (2012–2016)

Total		Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
		Number	Percentage	Number	Percentage	Number	Percentage
	Maloney Avenue/NM 609 Crash Totals	*0*	*100%*	*8*	*100%*	*8*	*100%*
	All Crash Totals	*47*	*100%*	*95*	*100%*	*142*	*100%*

Crash Classification	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Other Vehicle	0	0.0%	3	37.5%	3	37.5%
Pedestrian	0	0.0%	4	50.0%	4	50.0%
Rollover	0	0.0%	1	12.5%	1	12.5%
Maloney Avenue/NM 609 Crash Totals	0	0%	8	100%	8	100%

Highest Contributing Crash Factor	Fatal Crashes		Serious Injury Crashes		Severe Crash Sub-Total (Fatal + Serious Injury Crash)	
	Number	Percentage	Number	Percentage	Number	Percentage
Alcohol/Drug Involved	0	0.0%	5	62.5%	5	62.5%
Disregarded Traffic Signal	0	0.0%	1	12.5%	1	12.5%
Excessive Speed	0	0.0%	2	25.0%	2	25.0%
Maloney Avenue/NM 609 Crash Totals	0	0%	8	100%	8	100%

**Note: Crash data from the University of New Mexico **Note: Numbers down the rows add to 100% of crashes per each Crash Classification, and Highest Contributing Crash Factors section*

Photo Inventory

Figure 46 shows the intersection of Maloney Avenue/NM 609 and 9th Street viewing east. The image depicts a dedicated left-turn lane, two eastbound through-lanes, and two westbound through-lanes. The surrounding area contains single-family residential units and small commercial development to the north and the parallel roadway of I-40 to the south. Figure 47 shows the intersection of Maloney Avenue/NM 609 and 3rd Street viewing east. The image depicts two opposing dedicated left-turn lanes, two eastbound

Figure 46 | Maloney Avenue/NM 609 View East at 9th St

Figure 47 | Maloney Avenue/NM 609 View East at 3rd St

through-lanes, and two westbound through-lanes. Additionally, 3rd street transitions into a southbound one-way roadway south of Maloney. One block to the east, 2nd Street/NM 610 transitions from a northbound one-way roadway to a two-way roadway north of Maloney Avenue.

Maloney Avenue/NM 609 Driveway Density

The New Mexico SAMM dictates that for roads such as Maloney Avenue/NM 609 (urban principal arterials with a full access traversable median) driveways are to be located no more than one per 200 feet when the road is 30 MPH or less; this spacing distance increases to a maximum of 325 feet when the roadway speed is between 35 and 45 mph. Figure 48 displays the density of driveways per 200 feet of roadway along the Maloney Avenue/NM 609 corridor between US 491 and east to the intersection of Maloney Avenue/NM 609 and 1st street. Between 9th Street and 2nd Street/NM 610, the Maloney Avenue corridor generally has two to four times the number of driveways than is specified in the SAMM for a roadway with these characteristics. All driveways along this portion of Maloney Avenue/NM 609 are on the north side of the street due to the proximity of the I-40 corridor, with the greatest driveway density between 6th and 7th Street. Reducing the number of driveways, through consolidations or other means, would in turn reduce the number of conflict points along the roadway.

Figure 48 | Maloney Avenue Driveway Density

3.9 Economic Cost of Crashes

The economy is substantially impacted by the myriad costs associated with motor vehicle crashes. Wage, productivity losses, medical expenses, administrative expenses, motor vehicle damage, and employer uninsured costs (e.g., increased cost of insurance, civil penalties, fines, legal fees, and time expended to address safety violations for example) are just a few of the calculable costs associated with motor vehicle crashes. According to the National Safety Council, crash costs can range from around $10,000 for a property damage only collision to over $1,500,000 per fatal collision.

Table 14 | Estimated Economic Cost of Crashes within Study Area

Economic Cost of Crashes in Study Area from 2012 - 2016			
	Crash Count	*Average Cost*	*Total Cost*
K- Fatal Crash	47	$ 1,542,240.00	$ 72,485,280.00
A - Serious Injury Crash	95	$ 90,270.00	$ 8,575,650.00
B - Non-Incapacitating Injury Crash	940	$ 26,112.00	$ 24,545,280.00
O - Property Damage Only Crash	3026	$ 11,526.00	$ 34,877,676.00
Total	***4108***		***$ 140,483,886.00***

Table 14 provides the estimated cost of crashes in the study area during a five-year timespan. The total estimated economic costs of crashes in the Gallup Area Safety Plan study area from 2012 to 2016 totaled approximately $140.5 million.

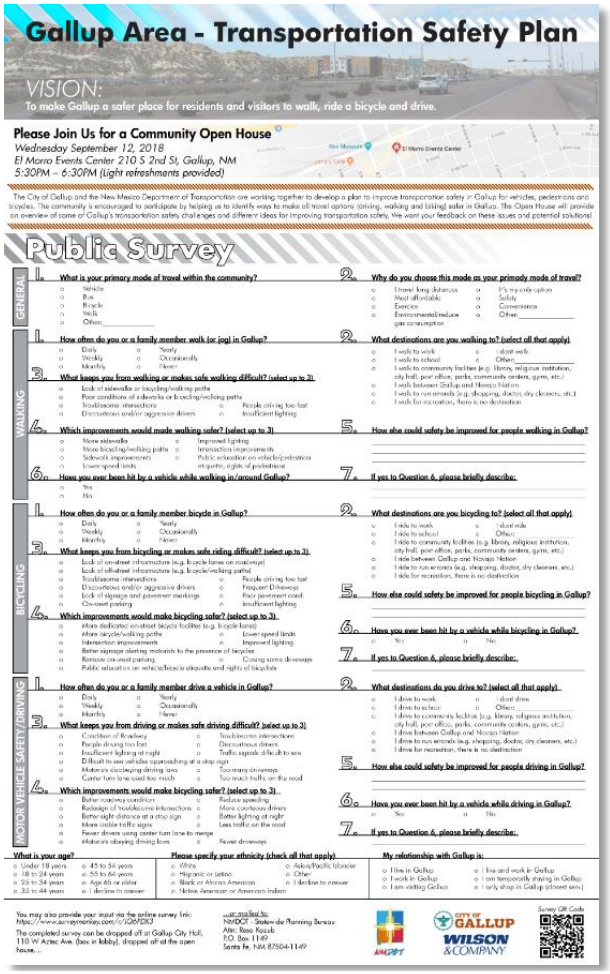
4 Public Involvement Process

4.1 Stakeholder Committee

The stakeholder committee comprises individuals from local and state governmental organizations, including public safety, as well as other professional organizations. The committee includes representatives from: the City of Gallup, the New Mexico Department of Transportation, the New Mexico Department of Health, the New Mexico State Police Uniform Bureau—Gallup/Grants, the McKinley County Sherriff's Department, the Gallup-McKinley County Chamber of Commerce, the City of Gallup Fire Department, the City of Gallup Police Department, and the Northwest New Mexico Council of Governments.

4.2 Public Survey

The study team conducted a Gallup Area Transportation Safety Plan public survey through Survey Monkey and the local newspaper, the *Gallup Independent,* and received a total of 38 responses between August and October in 2018 (Figure 49). Survey respondents were asked how safety could be improved for walkers, cyclists, and drivers in and around Gallup. A full record of results is in Appendix C of this document. Open-ended responses detailing opportunities were summarized based on the following areas:


Gallup Area - Transportation Safety Plan

VISION:
To make Gallup a safer place for residents and visitors to walk, ride a bicycle and drive.

Please Join Us for a Community Open House
Wednesday September 12, 2018
El Morro Events Center 210 S 2nd St, Gallup, NM
5:30PM – 6:30PM (Light refreshments provided)

Public Survey

Figure 49 | Public Survey in Published in Local Newspaper

- **Enforcement and Patrolling:** Provide speed enforcement and more police patrols throughout the day.
- **Public Education:** Teach defensive driving and sharing the road.
- **Sidewalks and Crosswalks:** Build more sidewalks and trails buffered from traffic and more or repainted crosswalks.
- **Bike Facilities and Infrastructure:** Develop a dedicated bike facility network.
- **Design and Infrastructure:** Implement safe design for new bike lanes, sidewalks, crosswalks, and roadways.
- **Signs:** Install more frequent stop signs, share the road signs, and indicators for bicycle and pedestrian infrastructure.
- **Lighting:** Improve lighting for sidewalks and bike paths.
- **Traffic Signals and Design:** Improve visibility of traffic signals (sunlight and visual obstructions) and synchronize signal timing.
- **Aware Drivers:** Enhance awareness to reduce careless and unsafe driving behaviors (ignoring signals, speeding, not sharing the road with other road users, and intoxicated drivers).
- **Animal Control:** Enhance animal control enforcement to address loose dogs.

Comments from the public survey revealed "Enforcement and Patrolling" as the highest ranked opportunity for improving safety among walkers, cyclists, and drivers. The commenters suggested that pedestrian safety could be improved by enforcing existing laws, addressing panhandling on streets, and patrolling near intersections to provide safer crossings for pedestrians. To improve cyclist safety, new laws could be implemented that protect riders, and existing driving laws should be enforced. As seen in Figure 50, respondents also expressed that driver safety can be improved by enforcing vehicle inspections and enforcing driving laws, such as speeding and obeying traffic signals.

Fifty percent of the survey respondents stated they walk or jog daily in Gallup. The majority walk for recreation or walk to community facilities. The survey respondents expressed strong support for comprehensive bicycle and pedestrian design. The commenters expressed a need for dedicated bicycle lanes and buffered trails and sidewalks. In addition to updating the existing sidewalks and crosswalks, these facilities should also have wayfinding and advisory signage to identify infrastructure and protect bicyclists and pedestrians. The commenters also expressed a need for public education on sharing the road with all modes of transportation.

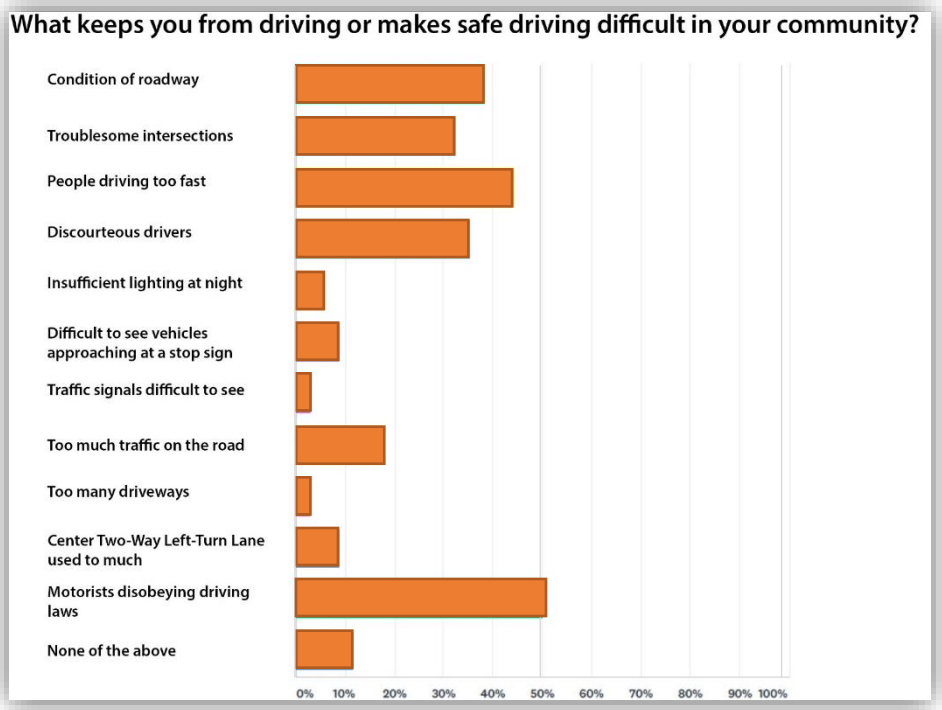


Figure 50 | Driving Safety Survey Response

4.3 Public Meetings

Two Community Open Houses were held as part of this planning process. The first was on September 12, 2018, and the second was on January 23, 2019. At the first meeting, community members provided input by engaging with interactive activities, including the survey. At the second Community Open House, the project team presented proposed implementation recommendations and updated potential designs for select corridors (see Figure 51).

Figure 51 | Route 66/NM 118 Potential Design and Existing Conditions

4.4 Council Update

On September 11, 2018, the project team briefed the Gallup City Council on the progress of the Gallup Area Transportation Safety Plan. The presentation to Council provided:

- a discussion of the plan's Vision, Goals, and Objectives;
- a brief overview of the SHSP emphasis areas; and
- a discussion on public outreach activities.

The full presentation is included as Appendix D of this document.

5 Safety Countermeasures

5.1 Countermeasures

In order to prevent future vehicular, pedestrian, and bicycle injuries and fatalities, the project team developed an inventory of applicable safety countermeasures. These countermeasures are detailed in the following tables and indicate where the greatest safety improvements can be achieved in different applications or scenarios. Table 15 provides seven design solutions regarding access management, which promotes safe and efficient use of the roadway. Restricting the available turning movements not only reduces potential conflict points but also creates a more delineated path for drivers, therefore reducing confusion and the potential for human error. For each countermeasure listed in the tables below, applicable crash types and the crash reduction percentage/factor (CRF) are listed to indicate which countermeasure may be the most effective in reducing crashes.

Table 15 | Access Management Countermeasures

Access Management				
Countermeasure	*Crash Type*	*Crash Severity*	*Area Type*	*Crash Reduction Factor (CRF)*[4]
Consolidate driveways	Angle, Front On, Head On, Rear End, Run off Road, Sideswipe, Single vehicle	All	Urban	90%
Create directional median openings to allow left turns and U-turns	All crash types	All	Urban/Suburban	51%
Replace Two-way Left Turn Lane (TWLTL) with raised median	Head on	All	Urban	47%
	Angle	All	Urban	35%
	Angle, Front On, Head On, Rear End, Run off Road, Sideswipe, Single vehicle	All	Urban	23%
	Sideswipe	All	Urban	21%
	Rear end	All	Urban	19%
Convert an open median to a left-in only median (3/4 access)	Left turn	All	Urban/Suburban	45%
	All crash types	Serious and Other Injury	Urban/Suburban	5%
Provide a raised median	All crash types	Serious & Other Injury	Urban	39%
Add bump-outs	Vehicle/Pedestrian	All	Urban	30%
Change driveway access control from full access to right-in, right-out	All crash types	All	Urban	25%

[4] Federal Highway Administration, University of North Carolina Highway Safety Research Council, Crash Modification Factors Clearinghouse User Guide http://www.cmfclearinghouse.org/userguide_CMF.cfm (accessed September 10, 2018).

Throughout the public involvement process, participants identified better lighting for both vehicles and pedestrians as needed along Gallup's key corridors. Pedestrian-focused lighting at pedestrian crossings would make pedestrians more visible and increase visual awareness of a crossing location (Table 16).

Table 16 | Lighting Countermeasures

Lighting				
Countermeasure	*Crash Type*	*Crash Severity*	*Area Type*	*Crash Reduction Factor (CRF)*
Add lighting	All crash types	All	Urban	32%

Additional safety countermeasures for pedestrians include refuge islands in the median, crosswalk markings that are more prominent, and countdown timers informing pedestrians of the remaining crossing time (Table 17). The refuge island serves as an area for pedestrians to be protected from passing vehicles in cases where safely completing a crossing in time is not feasible (see Figure 52). The refuge island decreases vulnerability of the pedestrian to passing vehicles and allows for two-stage crossings. The contrast of high-visibility crosswalk markings catch a drivers' attention more easily, making pedestrians easier to see and less vulnerable to being hit by a driver. Countdown timers are programmed to give sufficient crossing time to pedestrians, based on the width of the street. These timers inform pedestrians of the length of time of the pedestrian clearance phase. These countermeasures are further discussed and illustrated in Chapter 6 of this plan, "Design Recomendations."

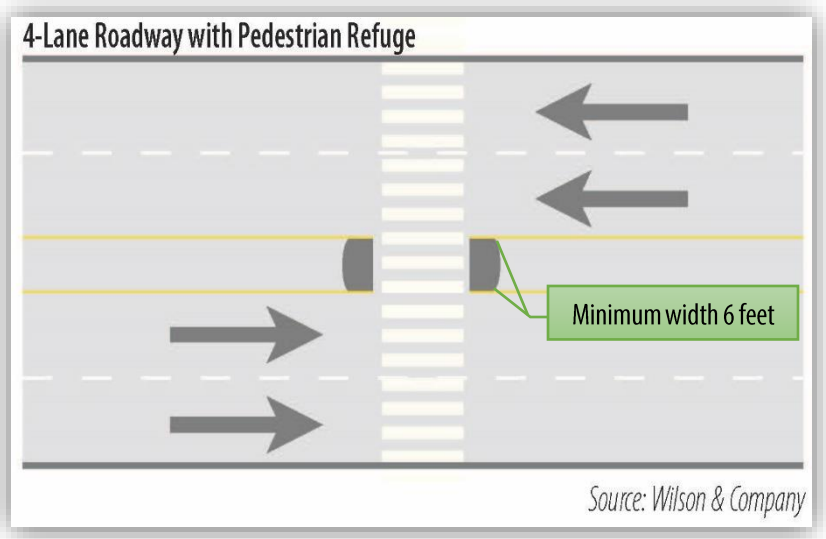


Figure 52 | Pedestrian Refuge Diagram

Table 17 | Pedestrian Countermeasures

Pedestrians				
Countermeasure	*Crash Type*	*Crash Severity*	*Area Type*	*Crash Reduction Factor (CRF)*
Add pedestrian refuge island	Vehicle/pedestrian	All	Urban	46%
Install high-visibility crosswalk	Vehicle/pedestrian	All	Urban	40%
Install pedestrian countdown timer	All crash types	All	Urban/ Suburban	13%
	Rear end	All	Urban/ Suburban	13%

Road diets, or a reduction in the number of vehicular through-lanes, can create a safer environment for vehicles, pedestrians, and bicyclists (Table 18). Road diets reduce the crossing distance for vehicles entering the roadway, typically improve sight-distance and reduce vehicle speeds, provide refuge for left-turning vehicles, and generally reduce the number of conflict points for all modes. Road diets further create a safer pedestrian environment, as pedestrians cross a reduced distance of vehicular traffic, may use the center turn lane as a refuge, and have an increased buffer between the sidewalk and vehicular lanes. Road diets can also create additional roadway space that may be repurposed for the installation of bicycle lanes or a paved shoulder (Figure 53).

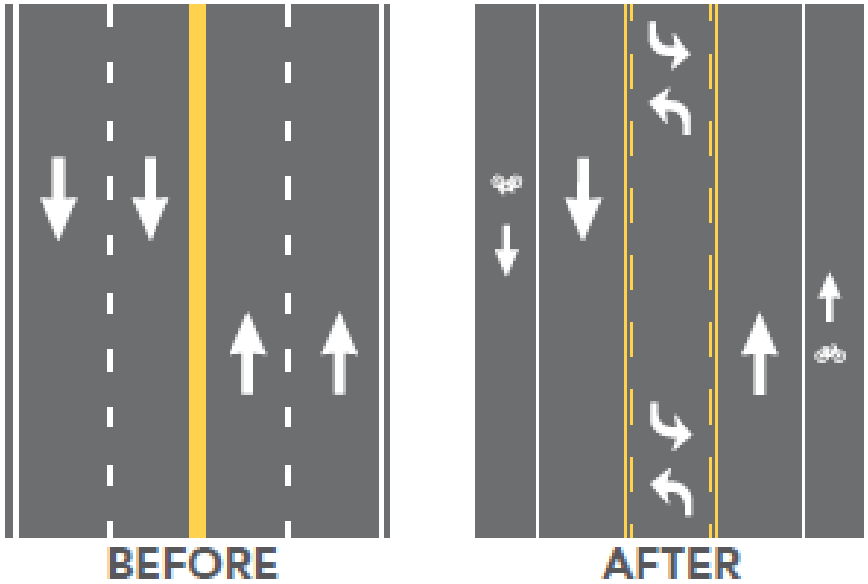


Figure 53 | Road Diet Example

Source: FHWA Road Diet Program

Table 18 | Road Diet Countermeasures

Road Diet				
Countermeasure	*Crash Type*	*Crash Severity*	*Area Type*	*Crash Reduction Factor (CRF)*
Convert 4 lanes to 2 lanes plus turning lane	All crash types	All	Low crash areas	49%
Convert 4 lanes to 2 lanes plus turning lane	All crash types	All	Residential areas	48%
Convert 4 lanes to 2 lanes plus turning lane	All crash types	All	High driveway density	46%
Convert 4 lanes to 2 lanes plus turning lane	All crash types	All	Commercial areas	45%
Convert 4 lane to 2 lanes plus turning lane	All crash types	All	Low driveway density	37%
Convert 4 lane to 2 lanes plus turning lane	All crash types	All	Mixed-use areas	34%
Convert 4 lane to 2 lanes plus turning lane	All crash types	All	High-crash areas	28%

6 Design Recommendations

Design recommendations are an integral part of planning studies; the recommendations can be used to encourage the inclusion of safety improvements in future road maintenance projects and new development. These recommendations serve as the backbone for the implementation of findings in most planning level documents. However, whereas planning studies identify issues and provide conceptual solutions, implementation of those solutions may require policy changes by elected officials at the local and/or state levels. This document is not regulatory in nature but is intended to help influence policy decisions for those in positions of authority and aid in securing funding for safety improvement projects. The implementation of these design recommendations may help address the safety concerns identified in this plan.

The project team presented crash reduction strategies at a stakeholder meeting in September 2018 to representatives from the following agencies:

- City of Gallup
- Northwest New Mexico Council of Governments (NWNM COG)
- New Mexico Department of Transportation (NMDOT)
- City of Gallup Fire Department
- City of Gallup Police Department
- McKinley County Sheriff's Office
- Chamber of Commerce

These recommendations are intended to mitigate vehicular, pedestrian, and bicycle crashes. The recommendations are listed below with brief explanations on the benefits of implementation.

6.1 Roadway Design Recommendations

6.1.1 Implement Access Management

Issue: There is a direct correlation between the number of closely spaced driveways and the number of crashes. The close proximity of driveways leads to vehicle deceleration safety issues and confusion between drivers over right-of-way. This increases the conflict points and thus increases the probability of a collision. If bicycles and pedestrians are present, the level of risk for a fatal or serious injury crash increases for those vulnerable road users.

Solution: By increasing distances between driveways and/or intersections, the following outcomes would be expected:

1) Fewer conflicting turning movements
2) The amount of conflict points is decreased
3) Decreased risk of crashes due to the reduction in potential conflicts

Strategy: The City of Gallup should adopt the New Mexico Department of Transportation (NMDOT) State Highway Access Management Requirements (18.31.6 NMAC) (SAMM). In areas where there are safety concerns, NMDOT should consider applying the SAMM standards to the NMDOT roads and the City should apply the SAMM standards to city-owned roads.

6.1.2 Install Bump-Outs

Issue: Large intersection geometries support higher vehicle speeds through an intersection. On-street parking typically decreases pedestrian visibility and increases intersection crossing distance.

Solution: Bump-outs of the curb edge at intersections:

1) Enclose on-street parking and provides a sense of constraint for drivers at intersections resulting in lower speeds.
2) Bring the pedestrian closer to the travel lane edge so pedestrians are more visible to drivers and motorists are more visible to pedestrians.
3) Tighten the turning radius requiring vehicles to slow down.
4) Shorten the crossing distance for pedestrians, reducing the time they are on the roadway and reducing their exposure to traffic (Figure 54).

Figure 54 | Bump-Out at an Intersection

Strategy: The City and NMDOT should implement an intersection bump-out design strategy for locations where pedestrian activity and on-street parking co-exist.

6.1.3 Increase Lighting

Issue: Lack of lighting limits visibility between drivers, cyclists, and pedestrians during nighttime hours, thus creating a safety hazard.

Solution: Improve lighting at intersections, midblock crossings, and along corridors.

Strategy: The City and NMDOT should implement design standards that improve lighting at locations where vehicles, pedestrians, and cyclists interact.

6.2 Pedestrian-Related Recommendations

6.2.1 Install High-Visibility Crosswalks

Issue: When crosswalks are hard to see, the pedestrian may be unsure where to safely cross the road, resulting in jaywalking or crossing at unsafe locations. This creates an unsafe environment for the pedestrian and confusion among drivers about where to anticipate pedestrians.

Solution: Increase crosswalk visibility by:

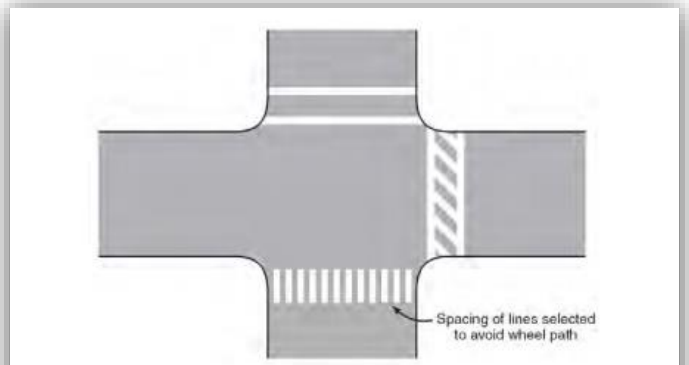
1) Implementing signing and striping in accordance with the NMDOT Signing and Striping Manual (Figure 55).[5]

2) Adding a "State Law: Yield to Pedestrians within Crosswalk" advisory signage on roadway centerline.[6]

3) Enforce pedestrian crossing laws.[7]

Strategy: Install and maintain appropriate crosswalk markings and signing. Additionally, an education campaign should be conducted to enhance the awareness of pedestrian crossing laws.

Figure 55 | NMDOT Crosswalk Design Standards



Type of Crosswalk	Minimum Width of Transverse Markings	Minimum Width of Longitudinal Markings
Standard – solid white crosswalk lines	6 inches	n/a
Diagonal stripes	optional, but 6 inches if used	12-24 inches
Piano keys – longitudinal stripes	optional, but 6 inches if used	12-24 inches

[5] New Mexico Department of Transportation, *Signing and Striping Manual,* March 2008, http://dot.state.nm.us/content/dam/nmdot/Infrastructure/SignandStripingManual.pdf (accessed April 12, 2019).

[6] U.S. Department of Transportation, FHWA, *Manual on Uniform Traffic Control Devices* (MUTCD), "2009 Edition Part 2 - Figure 2B-2. Unsignalized Pedestrian Crosswalk Signs," last modified February 5, 2017, https://mutcd.fhwa.dot.gov/htm/2009/part2/fig2b_02_longdesc.htm (accessed April 12, 2019).

[7] NM Stat § 66-7-334: Pedestrians' right of way in crosswalks.

6.2.2 Install Pedestrian Countdown Timers

Issue: Pedestrians are not given adequate time to cross the street and/or are not receiving sufficient advanced warning that crossing time has ended.

Solution: 1) Install pedestrian countdown timers, either pedestrian actuated push-buttons or fixed (meaning automatic), as appropriate.

2) Use *Manual on Uniform Traffic Control Devices* (MUTCD) minimum pedestrian speed of 3.5 feet per second so that the crossing conforms to ADA standards and allows adequate crossing time based on the street width. This generally equates to 10 seconds of crossing time for a 35-foot wide roadway.

Strategy: Install pedestrian countdown timers at all signalized pedestrian crossings. Priority should be given to locations in the downtown and along arterial corridors.

6.2.3 Install Pedestrian Refuges

Issue: Longer crosswalks without a pedestrian refuge area, are intimidating for some pedestrians. Not having a raised or protected median in the roadway makes the road a large distance to cross in one stage. Crosswalks at large intersections make a pedestrian vulnerable to turning vehicles.

Figure 56 | Pedestrian Refuge at Intersection

Solution: A median extended to the intersection with a break for the crosswalk can serve as a safety refuge island for crossing pedestrians (Figure 56). This breaks the crossing into two smaller stages, and serves as a barrier for vehicles to restrict their movement to the travel lane.

Strategy: Install six-foot wide (minimum) pedestrian refuges at marked pedestrian crossings where the pedestrian crosses more than three travel/turn traffic lanes (generally greater than 40-feet of unprotected crossing space). In locations where medians are present, a six-foot wide pedestrian refuge and pedestrian crossing button at the median is recommended. [8]

[8] National Association of City Transportation Officials, "Urban Street Design Guide," 2013, available at https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/pedestrian-safety-islands/

6.3 Bicycle-Related Recommendations

6.3.1 Install Bicycle Facilities

Issue: Between 2012 and 2016, there were 21 crashes involving cyclists within the study area. Public input received from the survey and at the Community Open House indicate a need for increased safety for cyclists.

Solution: Dedicated bicycle facilities increase the overall visibility and presence of cyclists. Stakeholder and public input indicates support for a cycle track on Route 66/NM 118 (Figure 57) or a multi-use path parallel to Route 66/NM 118.

Strategy: Develop a bicycle network that provides safe connectivity between key activity locations. The bicycle facility types chosen should be based on the level of traffic stress (the stress or discomfort that a bicyclist experiences while riding), and roadway characteristics, including the amount of traffic, access, speed, and truck traffic.

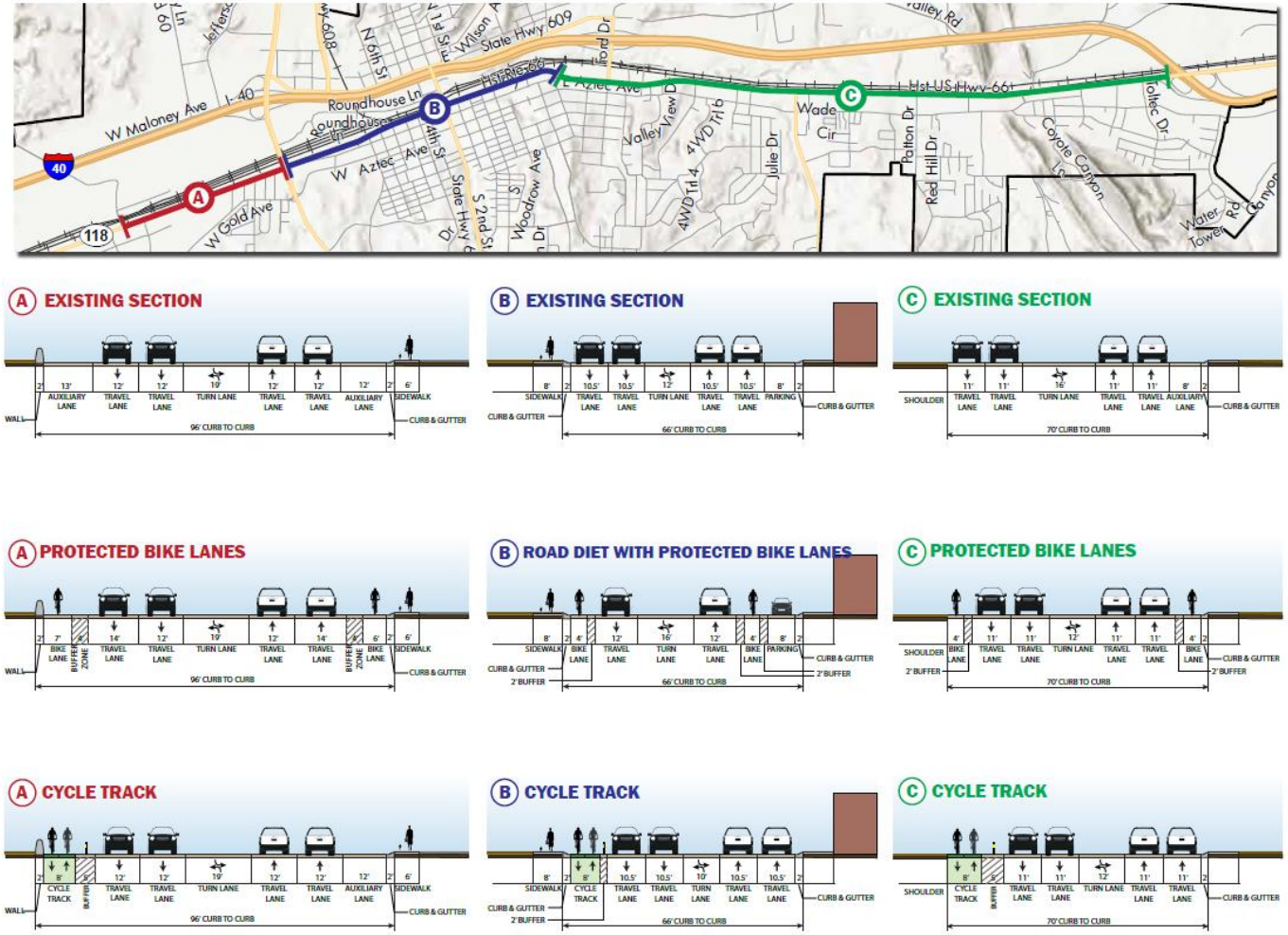


Figure 57 | Bicycle Facity Options on Route 66/NM 118

7 Implementation Strategies

The Implementation Strategies must align with the plan's vision and communicate the steps for future activities. The Implementation Strategies are the responsibility of all agencies with jurisdiction in the Gallup area. In some cases, safety improvements will occur as a result of enhanced awareness and as project recommendations are implemented. With increased awareness, more multi-agency coordination and communication generally occurs, which leads to increased potential for collaboration and funding opportunities.

Specific to the Gallup area, the Northwest Regional Transportation Planning Organization (NWRTPO) is a critical planning forum for prioritizing projects and communicating regional priorities to NMDOT. The NWRTPO is tasked with supporting the planning and development needs for Northwest New Mexico, and it is the resource to access federal and state transportation funding programs, such as the:

- Transportation Alternatives Program (TAP);
- Highway Safety Improvement Program (HSIP);
- Local Government Road Fund (LGRF); and
- Congestion Mitigation and Air Quality Improvement Program (CMAQ).

In addition, the Traffic Safety Division of the NMDOT manages funding programs that relate to behavioral safety strategies, such as: DWI discouragement programs and enforcement, including the ENDWI campaign and 100 Days and Nights enforcement; vehicular occupant protection; driver education for teens; driver safety; ignition interlock programs with certification and indigent funding; and pedestrian and bicycle safety programs, such as the Look For Me campaign.

The Traffic Safety Division has statutory oversight of the following areas:

- Ignition Interlock
- Driver Education Schools
- Driver Safety Schools
- DWI Schools
- Underage Drinking Prevention
- DWI Awareness "None for the Road"
- Traffic Records/Uniform Crash Report
- Occupant Protection/Seatbelt
- DWI Programs
- Highway Safety Plan

The stakeholder committee developed the following recommendations for the Gallup area, in order to foster an understanding of safety and support the development of safety improvements. Although some of the recommendations are specifically related to NMDOT facilities, the need for safety improvements is a multi-jurisdictional effort that requires coordination and facilitation by all agencies with jurisdiction in the Gallup area. Jurisdictions include, but are not limited to, agencies that own, maintain, conduct operations, patrol, and/or approve land uses on public roadways used by motor vehicles, bicyclists, and pedestrians.

The intent of this plan is to establish awareness throughout the community of needed safety improvements. Agencies that provide grants often require projects or needs to be identified in a plan in order to qualify for funding. The project team developed potential design layouts for the Route 66/NM 118 corridor (Appendix E), the US 491 corridor (Appendix F), and the US 491 and I-40 interchange (Appendix G). These design layouts were used to elicit feedback from the public and the stakeholder committee.

7.1 Gallup Area Transportation Safety Plan Implementation Strategies

This section outlines specific implementation actions developed by the project team and stakeholder committee for consideration by agencies in the Gallup area. The section includes process recommendations, recommendations for further study, as well as recommendations by transportation mode.

7.1.1 Process Refinements

The City and Northwest Regional Transportation Planning Organization (NWRTPO) should collaborate and conduct an annual review of fatal and serious injury crashes from the available UNM compiled crash data. The crash data from UNM can be mapped using Google Earth Pro, a free online mapping software, combined with using a data conversion tool to convert the crash data from Excel to .kml format. The process for using the Google Earth Pro and .kml conversion tool is included in Appendix H. For locations where there are fatality and serious injury crashes, the data should directly influence the project prioritization and City/NWRTPO recommendations to NMDOT for consideration. The annual review of severe crashes also will allow the City and NWRTPO to understand and track potential trends or systemic roadway safety issues so future improvement recommendations and projects can address known safety needs.

7.1.2 Priority Studies to Conduct

There are six location studies that are recommended to examine safety and enhanced connectivity/mobility in the Gallup area (Figure 58).

1. **Route 66/NM 118 (High Priority):** Conduct a Phase A/B study on Route 66/NM 118 from NM 566 (Church Rock) to the western limits of Gallup at the intersection of Defiance Draw Road and the BNSF Railroad crossing. The Phase A/B corridor study is approximately 17.5 miles. The Phase A/B study will:
    - define the access management strategy for the corridor.
    - define the interchange terminal ramp intersection types at the east and west interchanges.
    - define sight distance improvements at intersections and driveways.
    - define pedestrian improvements along and crossing the corridor.
    - define bicycle accommodation improvements along and crossing the corridor.

- define traffic calming opportunities to reduce prevalent speeds.
- assist NMDOT and the community with prioritizing projects along this corridor.

2. **I-40/491 Interchange (High Priority):** Conduct a Phase A/B study on the I-40/US 491 interchange area to include the north interchange ramps, ramp terminals, and the east and west side West Maloney Avenue. The study will:
   - examine interchange configurations that reduce the number of conflict points to enhance safety.
   - improve mobility for all road users.
   - enhance safety for pedestrians crossing the ramps and the intersection at West Maloney Avenue.
3. **I-40 Pedestrian Deterrent (High Priority):** Conduct a Phase A/B study or Road Safety Audit to evaluate alternatives to restrict and deter pedestrians from crossing I-40 and the BNSF mainline at-grade in the vicinity of US 491.
4. **I-40/Ford Drive:** Conduct a Phase A/B study on Ford Drive to evaluate interchange and geometric configuration at Route 66/NM 118, including the section between Joseph Montoya Boulevard and Aztec Road.
5. **US 491:** Conduct a Phase A/B study or Road Safety Audit between I-40 and the signalized intersection with North 9th Street to evaluate alternatives to improve mobility and safety for all modes. The study will:
   - evaluate access control enhancements to close median breaks where driveways and streets are not present today.
   - evaluate driveway access locations to identify opportunities to consolidate or remove driveways.
   - examine methods to slow traffic on the corridor.
   - evaluate pedestrian crossings to reduce crossing distances and the need to provide refuge areas.
6. **I-40 North Frontage Phase A/B:** Conduct a Phase A/B study to examine the connectivity on the north side of I-40 between the four interchanges in Gallup (Route 66/NM 118 east interchange, Ford Drive, US 491, and Route 66/NM 118 west interchange) and railroad crossing opportunities (improving existing crossings or providing new crossings). This should include evaluation of a north-side bicycle facility on or along the corridor. This will enhance safety and mobility by removing local traffic from I-40 and potentially reducing traffic from Route 66/NM 118, the four freeway interchanges, and at-grade railroad crossings.

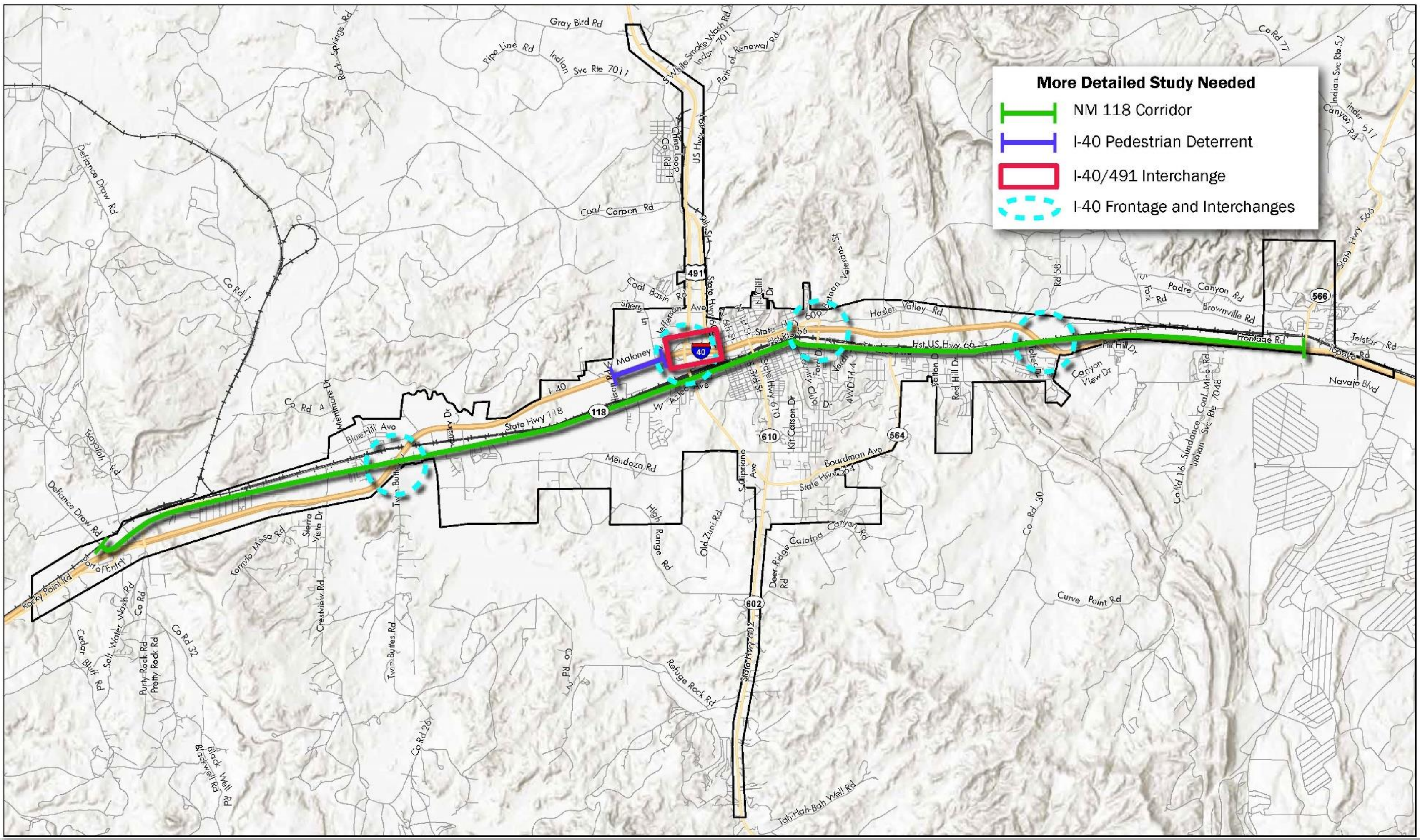


Figure 58 | Future Study Needs

7.1.3 Auto-Related Implementation Actions

The following recommendations are specific to auto-related safety improvements but may also influence the other modal strategies in this plan.

- Review traffic signal heads regarding the head alignment with travel lanes. Also, review the need for additional side-mounted signals and traffic signal head backplates due to morning and evening sun angles. The associated pedestrian crossing signals should also be evaluated regarding the presence of countdown timers.
- If a proposed development requires an NMDOT-issued highway access permit and 1) will generate 100 or more trips in a peak hour, 2) create or exacerbate a safety concern, and/or 3) negatively impact traffic level of service, NMDOT should require a traffic impact study. The City should also consider a similar requirement for properties that meet these criteria but that do not require an NMDOT-issued access permit. NMDOT and the City should also consider:
    1. encouraging cross-access agreements for commercial properties.
    2. requiring conformance with the NMDOT SAMM.
    3. evaluating intersection sight distance for any new driveway/intersection.
- Provide SAMM-compliant Access Management for new commercial development, which will require limiting median breaks at street and driveway intersections. Consider use of ¾ access (left-in only median) when a street or driveway needs more than a right-in/right-out access.
- Institutionalize Access Management strategies, including:
    1. encouraging cross-access between commercial properties.
    2. protecting intersection influence areas from driveways.
    3. reducing the number of full-access driveways.
- Enhance lighting on arterial and collector corridors.
- Increase enforcement against aggressive driving behaviors, such as DWI, traversing raised medians, speeding, or weaving across multiple travel lanes.
- Develop traffic calming design strategies on corridors where actual speeds exceed speed limits and where the safety of all users is contingent on slower speeds (e.g., commercial corridors, corridors with pedestrian and bicycle activity). Traffic calming measures may include: bump-outs, road diets, medians, lane narrowing, or landscaping.
- Reduce conflict points on Gallup roadways through roundabouts, access management, or other strategies, with particular focus on the six Focus Areas (e.g., Figure 59).
- Educate drivers to increase awareness of key crash contributing factors.
- Develop a wayfinding signage program to help direct unfamiliar drivers in and around Gallup.
- Use intersection, median, and urban design features to reduce speeding through Gallup.
- “Right-size” streets to minimize excessive pavement widths.
- Maintain roadway striping so stripes are bright and visible.

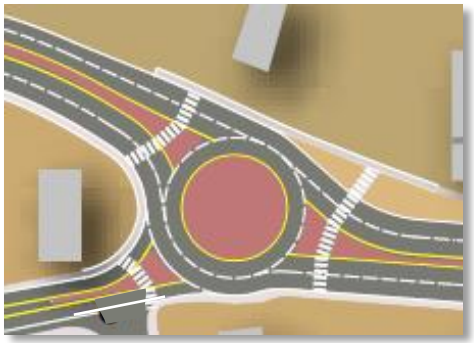


Figure 59 | Route 66/NM 118 Roundabout Concept

7.1.4 Pedestrian-Related Implementation Actions

- Update or develop a coordinated Trails, Bicycle, and Pedestrian Master Plan or set of plans.
- Complete an ADA Transition Plan.
- Make sidewalks and pedestrian ramps ADA compliant.
- Upgrade traffic signal pedestrian equipment to use countdown timers to inform pedestrians of available remaining crossing time.
- Encourage that new sidewalks be detached from the curb to provide a buffer space between pedestrian and motorist travel.
- Enhance lighting on arterial and collector corridors to enhance visibility of pedestrians during nighttime hours.

Figure 60 | Conceptual Rendering of Route 66/NM 118 with Raised Median and Pedestrian Refuge

- Book-end on-street parking with bump-outs to reduce pedestrian crossing distances at intersections and increase pedestrian visibility to drivers.
- Enhance safety through urban design by defining and developing pedestrian spaces to reduce conflicts with roadway vehicles and enhance the pedestrian space (e.g., installing planters, installing seating areas, providing on-street parking, installing bump-outs at crossing areas, using "continental" style crosswalk markings on all arterial and collector roadways and in areas of high pedestrian traffic, installing refuge areas in crossings wider than 48 feet, installing midblock crossings where appropriate) (Figure 60).
- Educate drivers on their roles and responsibilities in pedestrian safety. Potential campaign topics could include: drivers must yield to pedestrians, dangers of speeding vehicles to pedestrians, pedestrian zones, on-street parking areas, and activity center awareness.
- Enhance driver awareness of pedestrians in interchange areas by using signing, striping, and lighting.
- Enhance driver awareness of pedestrians at signalized intersections by using signing, striping, and lighting.
- Enhance visibility of pedestrians at night by providing reflectors/lights or brightly colored wearable items (e.g., vests, backpacks).
- Enhance signalized pedestrian crossings by using pedestrian countdown signals, and consider including leading pedestrian intervals, which give the pedestrian a few seconds of lead time prior to giving vehicles a green light.
- Implement applicable Every Day Counts Safe Transportation for Every Pedestrian (STEP) safety countermeasures to enhance driver awareness and pedestrian safety. STEP countermeasures include the items below, some of which are included elsewhere in this plan. Additional information about each measure can be found on the FHWA website [9] :

[9] U.S. Department of Transportation, FHWA, Center for Accelerating Innovation, "Safe Transportation for Every Pedestrian (STEP)," last modified January 24, 2019, https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/step2.cfm (accessed May 10, 2019).

  - Rectangular rapid flashing beacons
  - Leading pedestrian intervals
  - Crosswalk visibility enhancements
  - Raised crosswalks
  - Pedestrian crossing/refuge islands
  - Pedestrian hybrid beacons
  - Road diets
- Enhance pedestrian safety at railroad crossings. Pursue the recommendations for pedestrian safety included in the Road Safety Audit (see Section 2.2.8) for the 2nd Street/NM 610 and 3rd Street corridors.

7.1.5 Bicycle-Related Implementation Actions

- Update or develop a coordinated Trails, Bicycle, and Pedestrian Master Plan or set of plans. Provide defined areas for bicycle accommodation on arterial and collector roadways. This could be through the use of off-street multi-use paths, paved shoulders, cycle tracks, and conventional or protected bicycle lanes. Reference the most recent version of the AASTHO Guide for the Development of Bicycle Facilities for complete facility options and design guidance.[10]
- Plan and incrementally build out a contiguous network of bicycle supportive facilities throughout the Gallup area. Agencies should give priority to corridors with the highest existing and latent demand relating to enhancing bicyclist safety due to corridor traffic conditions (volume and speed); commuting to school and work; connections to community facilities/attractions; and recreational trips.
- Educate drivers on their roles and responsibilities in bicyclist safety. Potential campaign topics could include: bicyclists are legal users of the road, drivers must share the road, and the danger of speeding vehicles to bicyclists.
- Enhance visibility of bicyclists by enhancing street lighting.
- Encourage bicyclists to wear reflectors and bright clothing and to use front and rear lights at night.
- Provide bicycle detection at traffic signals.

[10] American Association of State Highway and Transportation Officials, The National Academies of Sciences, Engineering, and Medicine - Transportation Research Board, Toole Design Group, "Proposed Update of the AASHTO Guide for the Development of Bicycle Facilities," last modified December, 2018, http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3873 (accessed May 16, 2019)

7.1.6 Freight Truck–Related Implementation Actions

- As part of the Phase A/B studies recommended in Section 7.1.2, conduct a freight truck movement study to understand truck mobility and demands on the transportation system.
- Continue focusing truck-related land uses such as truck stops/travel plazas, truck inspection/repair, and accommodation at the east and west interchanges of Gallup to reduce through–freight truck interaction with resident and visitor travel in Gallup.
- Develop enhanced truck parking areas at the east and west interchanges to accommodate high volumes of freight trucks. The parking areas should have the capability to communicate parking availability to I-40 truckers through Intelligent Transportation System (ITS) technologies. The parking areas should facilitate truck parking in the event of a shutdown of I-40 due to an incident, weather, or other risk. Prior to implementing the parking facilities, a study should be conducted to understand predicted parking volumes during a shutdown.
- Consider using signage to limit through freight traffic on routes where higher capacity/heavier designed route alternatives with similar travel times exist.
- Educate small-vehicle drivers on how to drive relative to freight trucks. Possible campaign topics could include: how freight trucks and their drivers see the world, freight trucks' decreased stop time, and freight truck turning radii.

Appendix A – Crash Data Summary

Appendix B – Crash Maps

Appendix C – Public Survey Data

Appendix D – City Council Presentation Slides

Appendix E – Route 66/NM 118 Potential Design

Appendix F – US 491 Potential Design

Appendix G – US 491/I-40 Interchange Potential Design

Appendix H – Crash Mapping Tool