US 93 Critical Corridor Plan

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ONE NEVADA

TRANSPORTATION PLAN

Prepared For:

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SAFE AND CONNECTED

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BUILDING RELATIONSHIPS ONE PROJECT AT A TIME

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Acronyms and Abbreviations

ACEC	Areas of Critical Environmental Concern
ARTBA	American Road and Transportation Builders Association
AV/CV	Autonomous Vehicle/Connected Vehicle
AZ	Arizona
DOT	Department of Transportation
DVX	Downtown and Veterans Medical Center Express
FAA	Federal Aviation Administration
FAST	Freeway and Arterial System of Transportation
FAST Act	Fixing America's Surface Transportation Act
HDX	Henderson and Downtown Express
HOV	High Occupancy Vehicle
ID	Idaho
ITS	Intelligent Transportation System
LVCVA	Las Vegas Convention and Visitors Authority
MAP-21	Moving Ahead for Progress in the 21st Century
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
NV	Nevada
Plan	*One Nevada Transportation Plan*
RTC	Regional Transportation Commission of Southern Nevada
SR	State Road
TIBP	Transportation Investment Business Plan
UPRR	Union Pacific Railroad
US	United States

1.0 Introduction

The Nevada Department of Transportation (NDOT) is developing the *One Nevada Transportation Plan* (Plan), an update to the state's federally required Long-Range Transportation Plan. The Plan is a performance-based transportation plan that identifies needs and strategically supports decision-making for future investments that will improve Nevada's multimodal transportation system. It is intended to be a living document that is a part of a continuous process of planning, implementation, operation, and preservation of Nevada's transportation system that will evolve over time to reflect and be responsive to future changes in needs, resources, and priorities.

1.1 US 93 Critical Corridor Plan

The *US 93 Critical Corridor Plan* is one of several specific transportation corridor plans of the Plan. The primary goal is to evaluate the performance of US 93 and identify projects that will improve the corridor's performance. This document will analyze previous planning studies and current relevant data to identify the needs along the US 93 corridor. Based on these needs, projects will be identified that can improve the performance toward the target in an effort to achieve the overall Plan goals. In a subsequent phase, these projects will be prioritized for future implementation.

The corridor performance is aligned with the overall One Nevada Transportation Plan effort for statewide goals. The measures, the data, and the targets are shown in **Table 1**.

Table 1: Performance Measure Alignment with Goals, Data, & Targets

One Nevada Plan Goal	US 93 Performance Measures	Performance Measure Target	Data Used
Enhance Safety	Traffic Fatalities, 5 year rolling average	Zero fatalities	NDOT Safety Data, 5-year total number of fatalities per mile by segment
Preserve Infrastructure	Bridge Sufficiency Ratings	Zero "poor" ratings	NDOT Bridge Data, number of "poor" bridges
	Pavement Condition	Less than 5% of pavement in Poor Condition	NDOT Pavement Serviceability Index (PSI) Data, percent in "poor" condition
Optimize Mobility	Travel Time Reliability, Corridor Chokepoints based on Average Travel Speed	Minimum Average Travel Speed 0 to 5 miles per hour less than Posted Speed Limit	Minimum average travel speed in each segment based on INRIX data
Transform Economies	Access to Economic Generators – Qualitative Scale – 1 through 3	Level 3 Access to Economic Generators	Proximity to major economic centers
Foster Sustainability	Access to Alternative Fuels - Qualitative Scale – 1 through 3	Level 3 Access to Alternative Fuels	Readiness for electric charging stations
Connect Communities – Multimodal Options	Access to Alternative Modes Qualitative Scale – 1 through 3	Transit availability Level 3	Transit connections from US 93
		Bike/ped facilities availability Level 3	Bike/ped facilities connected to or incorporated into US 93

1.1.1 Limitations of this Corridor Plan

This document provides a snapshot of the conditions along US 93 at a specific point in time. The performance and project recommendations will be reevaluated based on the most recent data or revised performance measures when the Plan is regularly updated.

In a subsequent phase, projects will be identified as near-term, mid-term, or long-term solutions based on the needs of the corridor. The current project list is based on previous planning efforts, but additional projects could be added to address the needs identified. Potential projects within the US 93 corridor will be prioritized based on the scoring from the evaluation of the performance measures. The goal is that each project will be reported consistently with information sufficient for project prioritization. This effort will be tied with the overall project prioritization process being conducted with the Plan.

This document does not provide a prioritization of all projects across different corridors or funding streams.

1.2 Corridor Description and Segments

The US 93 corridor is approximately 520 miles through the state of Nevada connecting the city of Las Vegas with the states of Idaho and Arizona. For the US 93 Critical Corridor Plan, US 93 is divided into six segments to reflect the unique nature of the corridor within the Las Vegas metropolitan area and outside the urban area. A map of US 93 within the state of Nevada can be viewed in **Figure 1**.

1.2.1 Segment A – Arizona/Nevada State Line to I-515 – 12.5 miles

Segment A extends from the Arizona/Nevada border to its transition into I-515 (also US 95) as it approaches the Las Vegas metropolitan area. Segment A is generally a four-lane principal arterial with a speed limit that varies from 35 MPH (within Boulder City) to 65 MPH. The segment of US 93 through Boulder City will change in the near future with the completion of the Boulder City Bypass (Interstate 11).

1.2.2 Segment B – I-515 to I-15 – 20.5 miles

Segment B extends from the transition into I-515 at the Henderson Spaghetti Bowl interchange to I-15 at the Las Vegas Spaghetti Bowl interchange. Segment B widens from a four-lane principal arterial to as much as an eight-lane interstate and has a posted speed limit of 65 MPH.

1.2.3 Segment C – I-15 to Exit 64 – 21.5 miles

Segment C extends along I-15 from the Spaghetti Bowl interchange to Exit 64. This segment is described in detail within the I-15 Critical Corridor Plan.

1.2.4 Segment D – Exit 64 to Ely, NV – 260.5 miles

Segment D extends along US 93 from Exit 64 along I-15 to Ely, NV. Segment D is generally a two-lane rural principal arterial with a speed limit of 70 MPH.

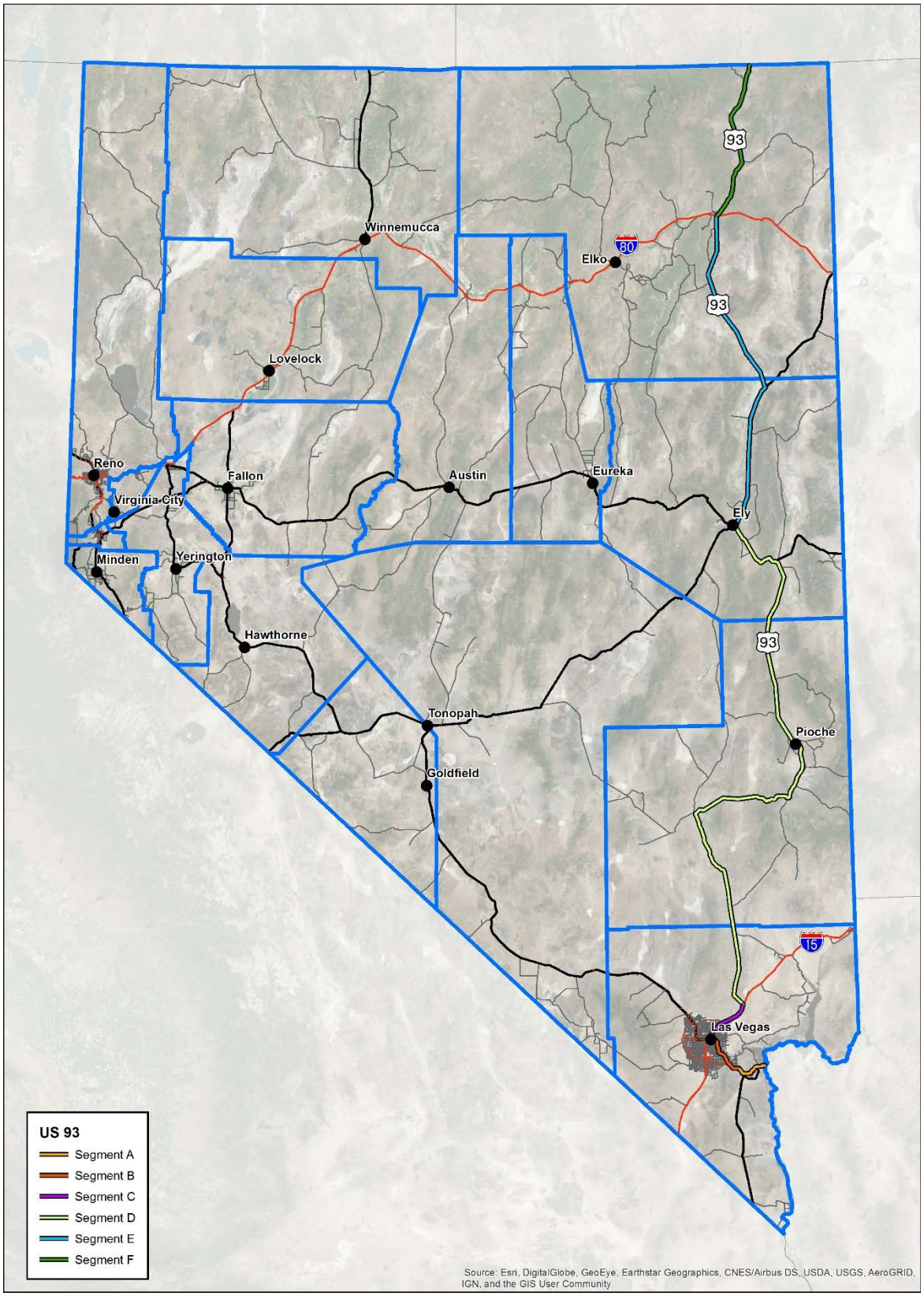

Figure 1: US 93 Corridor in Nevada

1.2.3 Segment E – Ely, NV to I-80 – 137 miles

Segment E extends along US 93 from Ely, NV to I-80. Segment E is generally a two-lane rural principal arterial with a speed limit of 70 MPH.

1.2.4 Segment F – I-80 to Nevada/Idaho State Line – 68 miles

Segment F extends along US 93 from I-80 to the Nevada/Idaho state line. Segment F is generally a two-lane rural principal arterial with a speed limit of 70 MPH.

2.0 US 93 Background

US 93 is a major north-south United States highway located in the western United States. The southern terminus of US 93 is at US 60 in Wickenburg, AZ; whereas, the northern terminus is the United States/Canada border (where it continues as Highway 93). Major cities US 93 travels through include Las Vegas, NV; Twin Falls, ID; Missoula, MT; and Kalispell, MT.

2.1 Corridor Characteristics

2.1.1 National Context

US 93 is a direct north-south link between Phoenix and Las Vegas, two of the fastest growing metropolitan areas in the U.S. It carries a high volume of east-west traffic from I-40 to Las Vegas and I-15. US 93, in combination with other highways, creates a continuous Canada to Mexico (CANAMEX) corridor through the U.S. between Calgary, Alberta (Canada), and Nogales, Sonora (Mexico).

2.1.2 Regional Connectivity

US Highway 93 passes through the town of Jackpot just across the Idaho state line and hits I-15 about 20-miles northeast of Las Vegas. Ely, NV is approximately halfway. The total distance is approximately 487-miles of high desert two lane principal arterial and takes about 7-hours to drive. Due to a lack of direct alternative routes to US 93, major incidents that close US 93 cripple traffic, causing added congestion, reduced reliability, and lost economic dollars.

2.1.3 Freight Movement

In 2015, the Las Vegas metropolitan area was the origin for over $25 billion worth of trucking goods' movement and the destination for over $40 billion worth of trucking goods' movement (FAF 2015). These values are projected to increase to $36 billion and $66 billion in 2040. Improvements to the transportation system encourage freight movement, so ensuring that US 93 can keep up with the growing freight volumes is critical to the economic growth of Southern Nevada.

US 93 is one of a select few facilities across the country which permit longer combination vehicles, making it attractive for more efficient freight movement, particularly with the onset of automated/connected freight fleets.

2.1.4 Recreation and Tourism

On a broad scale across the Intermountain West, the US 93 corridor takes residents of the west on vacation, in fact, US 93 is a key connector in accessing the Las Vegas Resort Corridor from Phoenix, AZ and the main access to Hoover Dam. Other important attractions within close proximity to US 93 include Lake Mead National Recreation Area, Great Basin National Park, and the Ruby Mountains. Smaller communities along US 93 are more and more turning to recreation and tourism to diversify their economies. For example, Caliente is nearing completion of approximately 40 miles of off-road mountain bike trails to attract outdoor enthusiasts.

2.1.5 Multimodal Uses

Local Transit

The Las Vegas metropolitan area has a robust system of local and regional transit options. Two regional express bus routes (Henderson and Downtown Express (HDX), Downtown and Veterans Medical Center Express (DVX)), operated by the Regional Transportation Commission of Southern Nevada (RTC), use portions of the US 93 corridor.

Passenger Rail

There is no passenger rail service along the US 93 corridor. Connections to east/west Amtrak service are possible in Las Vegas and Elko.

Freight Rail

Union Pacific Railroad (UPRR) does not run exactly parallel to US 93, but it travels a similar path through the southern portion of Nevada. For instance, it runs from Boulder City, through the Las Vegas metropolitan area, and northeast near I-15. Once it connects with Moapa, it heads north and connects with US 93 again at Caliente. After that it veers to the east toward the state of Utah. In Northern Nevada, UPRR crosses paths with US 93 at Wells and then follows a similar path before it terminates at San Jacinto.

Freight Trucks

There are currently 12 truck parking locations along US 93 within the state of Nevada, which include Railroad Pass Hotel & Casino (MP 57), Morton's Truck Stop (Exit 46), Pilot Travel Center (Exit 48), Petrol Center (Exit 54), Loves Travel Stop (Exit 64), Pahranagat Lake Rest Area (MP 28-29), Crystal Springs Rest Area (MP 51), Pony Springs Rest Area (MP 148), Silver Sage Travel Stop (MP 40), Schellbourne Rest Area (MP 93), Flying J Travel Plaza (MP 74), and Loves Travel Stop (MP 74). All truck parking locations can be found on the NDOT website (https://www.nevadadot.com/mobility/freight-planning/truck-parking/u-s-93). The truck terminals and modal transfer facilities enhance multimodal operations.

Airports

McCarran International Airport is the primary hub of air travel in Southern Nevada, located near US 93 in the core of the Las Vegas Valley. It is ranked the ninth busiest airport in the US, with over 20 million enplanements a year (FAA 2016). The highest number of air travel trips to and from Las Vegas exist between nearby metropolitan areas. Most of these metropolitan areas are separated by 300 to 500 miles. The long distances between major markets and lack of competitive service for this distance offered by the existing passenger rail network have led to a disproportionate reliance on short-haul flights for travel within the region. In recent years, international routes to/from McCarran International Airport have increased considerably. Direct service is now available to Asia, Central and South America, and Europe. This trend is likely to increase with overall growth of the airline industry, particularly low-cost long-haul carriers.

In addition to commercial and passenger airline service, US 93 is within close proximity of multiple general aviation airports and Nellis Air Force Base between Boulder City and Jackpot. These airports provide a lifeline for the rural sections of US 93 and include Boulder City Municipal (BVU), North Las Vegas (VGT), Nellis Air Force Base (LSV), Alamo Landing Field (L92), Lincoln County (1L1), Ely/Yelland Field (ELY), Wells Municipal/Harriet Field (LWL), Jackpot/Hayden Field (06U). A detailed description of each of the airports can be found on the NDOT website (https://www.nevadadot.com/mobility/aviation/airport-directory).

Bicycle and Pedestrian

Bicycle and pedestrian use along US 93 is limited given the predominately rural character of the road coupled with interstate designation through the Las Vegas area. Bicycle and pedestrian use is prevalent in Boulder City and within rural communities north of I-15.

Utility Transmission

The NV Energy's One Nevada Transmission Line does not run exactly parallel to US 93, but it travels a similar path from I-15 to Ely.

2.1.6 Land Management and Jurisdictions

The US 93 Corridor passes through multiple jurisdictions and land holdings, much of which is land managed by the Bureau of Land Management. Through the Las Vegas metropolitan area, land adjacent to US 93 is primarily private land, with some military (Department of Defense) lands proximate in North Las Vegas (Nellis Air Force Base). Additional clusters of private land are located near Coyote Springs, Alamo, Ash Springs, Caliente, Panaca, Pioche, Ely, McGill, Currie, Wells, Contact, and Jackpot.

ACECs (areas of critical environmental concern) are located along US 93 in Lincoln and Nye counties. Several wilderness areas are located along the US 93 corridor through Lincoln, White Pine, and Elko counties, including Delamar Mountains, Meadow Valley Range, Arrow Canyon, Parsnip Peak, Fortification Range, Mount Grafton, Becky Peak, and Goshute Canyon.

2.2 Previous Planning Study Recommendations

Several planning documents have identified the conditions and performance of US 93, as well as recommendations for projects to address ongoing needs. The major issues and opportunities from each study are summarized in the following subsections, including specific improvement recommendations for projects on US 93.

2.2.1 Nevada State Freight Plan (2017)

The Nevada State Freight Plan identified projects that would improve freight movement through the state, enabling Nevada to enhance their economic competitiveness and foster growth in industries that are heavily freight-dependent. The following projects are recommended along US 93:

- Currently, there are no truck parking facilities with amenities along US 93 between Las Vegas and Ely (more than 3.5-hours apart), so an additional facility along this route is desirable.
- The Missing Major Corridor – The I-11 and Intermountain West Corridor provides a means to fulfill the congressionally designated CANAMEX Corridor, which was originally intended to connect Mexico, the United States, and Canada via the US 93 corridor to I-15. Rather than connecting from Las Vegas to Salt Lake City via I-15, a recent I-11 study found it more advantageous to connect major Intermountain West activity centers, including Reno, thereby creating the vision of a new corridor between I-5 and I-15. This new corridor would create economic synergies between the two largest metros in Nevada and facilitate greater production sharing between Las Vegas, Phoenix, and Mexico. Importantly, the proposed I-11 and Intermountain West Corridor would provide both Las Vegas and Reno with a strong northwest-southeast connection that could be the foundation for greater NAFTA trade and an eastward expansion of West Coast economic activity

that is currently hindered by the highly congested transportation network, relative scarcity of developable industrial land, and complex regulatory requirements. This would allow Nevada's population centers to become crossroads serving distribution functions.

In addition to projects, the Nevada State Freight plan discusses the following relevant items:

- Pursue an "all of the above" strategy to achieve sustainable transportation funding to operate, maintain, and expand Nevada's freight transportation system (US 93/SR 318 Corridor Study, Apex to Idaho Border).
- Petroleum is the main commodity shipped via pipeline to southern Nevada and delivered to the holding tanks in the northwest corner of the Las Vegas metropolitan area and at Apex Industrial Park. Nevada does not export or ship anything within the state using pipelines, therefore tanker trucks are distributed from these locations to fueling stations throughout the Las Vegas metropolitan area and to several mines in northern Nevada via US 93.

2.2.2 Nevada State Rail Plan (2012)

The Nevada State Rail Plan provides a plan for freight and passenger rail transportation in the state; prioritizes projects and describes intended strategies to enhance rail service in the state to benefit the public; establishes the five-year period covered by the Plan; and serves as the basis for federal and state investments in Nevada. Projects within the Plan along US 93 include:

- *Nevada Northern Railway*: The Nevada Northern Railway Museum and the White Pine Historical Railroad Foundation, which operates excursion trains in northeast Nevada, propose to rehabilitate the four miles of trackage from McGill Junction to McGill Depot in the near term and operate its McGill Junction Route on this extension. Reopening the closed US 93 at-grade crossing between McGill Depot and McGill Junction will require an evaluation of its traffic implications and inclusion of appropriate grade-crossing protection. An alternative one draft state rail plan reviewer suggested to avoid crossing US 93 at the "Club 50" crossing and at the currently-paved-over Poleline crossing at McGill Junction, plus other at-grade street crossings near McGill Junction, is to extend the museum's existing "Hi-Line" about two miles on the abandoned roadbed into the mill site and depot.
- *Nevada Southern Railway – Henderson*: A grade separation structure over US 93 will be built as Package 5 of Phase 1 of the Boulder City Bypass project, which will make the Nevada Southern Railway more visible (similar to the V&T overpass of US 50). This improvement at Railroad Pass will also permit extending the Nevada Southern Railway operation about seven miles on the existing city of Henderson-owned trackage from US 95 to the Fiesta Hotel at the UPRR-owned BMI Branch trackage. Providing a train platform, shelter, parking lot, and run-around track at the Fiesta Hotel will permit the Southern Nevada Railway to operate out of Henderson with Boulder City as the destination, creating a more attractive tourist package closer to the Las Vegas market. Tourist train traffic will need to be coordinated to maintain existing UPRR freight operations on the city of Henderson trackage.
- *White Pine County*: White Pine County would like to provide rail service for its existing Robinson Copper Mine, which currently ships by truck, and for its two start-up mines (Midway Gold's project and the Victoria mine near Currie), as well as be able to ship inbound loads of fuel, limestone, mill balls, and other mining supplies. Freight rail shipments can eliminate heavy ore truck usage, notably in Ely at the Junior High School, improving public safety, and can reduce

roadway deterioration. The County would like to improve its line for freight service. The County has a donation of 150,000 pounds of ballast, which could be applied to rail improvements. Needed rail improvements include raising some low areas of track, rebuilding culverts, and uncovering the rail line at US 93 in Currie, which the County would like NDOT to rectify. The County estimates that $40-50 million will be required to address its rail needs. In addition, White Pine County is interested to gain jobs associated with the renewable energy sector and space aviation/aerospace technology and feels that rail improvements on the Nevada Northern Railway are needed to capture the economic development. Future plans for the Cobre-to-Shafter segment include hauling earth fill materials and shipping copper from the mine.

- Phoenix-Las Vegas connectivity is also part of the proposed Golden Triangle high speed rail proposal, linking Los Angeles, Phoenix, and Las Vegas, which FRA is currently studying in its Southwest Multi-State Rail Planning Study.

2.2.3 Apex to Mesquite and Moapa Valley Corridor Study (2011)

The goal of the Apex to Mesquite and Moapa Valley Corridor Study was to identify and prioritize a range of improvements to serve the growth anticipated due to several planned developments north of the Las Vegas metropolitan area. Projected increases in both passenger vehicles and commodity flows are projected north of the Las Vegas metropolitan area along I-15, US 93, SR 168, and SR 169 that will result in major traffic congestion. The study area spans from the I-15/Apex (SR 604) Interchange, north of Las Vegas, along I-15 to Mesquite, along US 93 from I-15 to the Lincoln County Line, along SR 168 from I-15 to US 93, and along SR 169 from I-15 to Moapa Valley.

Proposed development and future growth along the corridor are driving the need for additional and improved access. There are three large, or “mega” projects being considered within the project area – Apex Overlay District, Coyote Springs, and Toquop Township – as well as other proposed developments. Additional and improved access to I-15, US 93, & SR 168 will need to be prioritized and coordinated to maximize mobility and safety, as some of the developments may compete for access. In addition, the existing and estimated future truck traffic on I-15 and US 93 is significant and must be taken into consideration and the fatality rate on US 93 is higher than the state average while other crash rates are lower than average.

For projects that are ready and have been slated for implementation, it is recommended that the project study team coordinate with NDOT roadway design and provide all information that was developed during the study process, including project description, environmental setting data, other existing condition data and cost estimate information, and prepare a brief Project Scoping Report. Projects included in this category are:

- Two truck climbing lanes on US 93 northbound from Mile Post 57 to Mile Post 59 and southbound from Mile Post 59 to Mile Post 61.

There are a number of projects that have been determined to be immediate action projects. These projects would provide immediate benefit to the traveling public by improving safety, increasing accessibility or reducing congestion. These projects, which are detailed in Technical Memorandum 7, should be constructed once funding becomes available. It is recommended that the immediate need projects be added to NDOT’s Statewide Transportation Improvement Program (STIP). It is further recommended that the project study team coordinate with NDOT Project Scoping and provide all

information that was developed during the study process, including project description, environmental setting data, other existing condition data, and cost estimate information. Projects included in this category are:

- I-15 Exit 64, US 93 Interchange ramp geometric improvements. I-15 northbound off ramp and the southbound on ramp are currently single lane ramps with a very large volume of truck traffic. The truck traffic travels northbound on US 93 and accesses the Republic Services landfill. The northbound off-ramp requires additional deceleration length and turning lanes at the intersection of US 93. The southbound on-ramp requires additional acceleration length and an additional lane on the ramp body. Between the on- and off-ramp intersection needs to be widened to provide a center turn lane. This project can be constructed with the current right-of-way.*

Other improvements, once they hit their triggers, include:

- Signal US 93/I-15 northbound ramps*
- Dual northbound left-turn lanes at US 93/I-15 northbound ramps*
- 2 westbound through lanes +1 shared westbound left-lane on US 93/I-15 southbound ramps*
- Signal at US 93/I-15 southbound ramps*
- Climbing lanes on US 93, approximately 5 miles in the northbound and 5.6 miles in the southbound directions
- High-T unsignalized intersection at US 93/SR 168*
- Widen US 93 to 4 lanes from I-15 to SR 168*
- Consider alternatives for the northbound left-turn movements from I-15 northbound to US 93*
- Free-flow dual ramps for the southbound right-turn movements from US 93 to I-15 southbound*
- Signalize or grade-separate (northbound only) High-T intersection at US 93/SR 168*
- US 93 4-lane extension from SR 158 to Street A
- US 93 4-lane extension from Street A to Street B
- High-T unsignalized intersection at US 93/Street A
- High-T unsignalized intersection at US 93/Street B
- Signalize or grade-separate (northbound through only) High-T unsignalized intersection at US 93/Street A
- Widen US 93 from existing 2-lane facility to 4-lanes
- Widen US 93 from 4-lane facility to 6-lanes

** Denotes projects under design and/or construction*

2.2.4 I-15 Corridor Alternate Route Study – Corridor Condition Inventory (2017)

The I-15 Mobility Alliance includes involvement from the Departments of Transportation (DOTs) in California, Nevada, Arizona, and Utah, as well as key stakeholders along the corridor. The Alliance transcends traditional transportation thinking by advancing innovation, long-range planning, investment, and implementation of multimodal systems; including not only increased mobility of people and goods through highways, freight rail, transit, and high-speed passenger rail, but also forward-looking technologies for the transport of energy, data, and communications. One of the elements of the mission of the I-15 Mobility Alliance is to maintain the efficient and effective operations of the I-15 Corridor. Through ongoing coordination efforts, it has become important to Alliance members to identify and

understand operational constraints for alternative routes to I-15. In times of major incidents or natural disasters that may close or severely constrain use of I-15, drivers can make better and more informed choices on detour routing with advanced notice. In many cases, potential routing choices are limited due to the rural nature of the corridor, and these decisions may need to be made many miles in advance of the closure to avoid bottlenecks. The purpose of this study was to identify regional alternate routes to I-15, inventory the existing conditions of those routes, and document potential needs to meet minimum operating conditions.

A set of reasonable alternate routes options were identified for each segment based on a regional perspective – considering travel between the four major metropolitan areas of Salt Lake City, Las Vegas, Inland Empire, and San Diego. A common thread emerged – the highest performing options included the US 93 corridor (with includes portions of US 93A, US 6, and NV 318) north of Las Vegas, and the US 95 corridor south of Las Vegas. By stitching together these highest performing options the backbone of the I-15 alternate route corridor emerged, with multiple options for connecting back to I-15 via other highways and interstates. With this framework in place, the interregional alternate route is defined as the US 95 corridor from I-10 (Blythe, CA) to I-515 (Las Vegas, NV), and the US 93 corridor from I-15 (Las Vegas, NV) to I-80 (Wells, NV), as shown in **Figure 2**.

Most of US 93A, US 93, and NV 318 are 2-lanes with long stretches that are straight and flat, providing ample opportunities for safe passing. US 6 is a 2-lane highway with approximately 10-miles of steep grades over Murry Summit, just south of Ely, Nevada which has limited opportunities for safe passing of slow-moving vehicles. US 93 around Pahranagat Lake is windy and narrow, inhibiting passing. Most of US 95 in Nevada is a 4-lane divided highway with a 70-mph speed limit. US 95 in California is a 2-lane highway that follows the profile of the terrain and is somewhat windy, providing fewer opportunities to pass safely.

The *Alternate Route Handbook* states: “Select routes that are easy for motorists to navigate and provide a sense of comfort” (FHWA 2006). There are sections of the corridor where US 93 and US 95 are collocated with interstate freeways, but they are well-marked and easy to navigate. However, one location on the corridor has caused confusion for years. The most direct route between I-80 and I-15 follows the route recommended in this study, which deviates from US 93 at Ely, following instead US 6 to NV 318 and rejoining US 93 at Crystal Springs. The 2015 *Annual Traffic Report* indicates that this route carries over three times the volume of traffic than does the parallel US 93. However, the through-movement follows the lower volume and less direct US 93. This is particularly problematic at the intersections of NV 318/US 6 and NV 318/US 93 where travelers following the proposed alternate route are required to either turn left or stop and turn right (depending on direction of travel). Those not familiar with this route could get confused by the options and signage and may end up missing the turn. During a heavily congested detour condition, traffic can dramatically back-up at these locations. This was evident during the I-15 closure in 2014 due to the Moapa flood. Southbound I-15 traffic was detoured at Cedar City, UT onto UT 56, to NV 319, and then to southbound US 93 back to I-15.

2.2.5 I-11 and Intermountain West Corridor Study (2014)

Arizona and Nevada have completed planning for a regional corridor with improved access between Las Vegas and Phoenix. Both states have already implemented various planning, design, and construction projects for potential corridor components, with the most notable projects being the completion of the Mike O’Callaghan – Pat Tillman Memorial Bridge, the construction of the Boulder City Bypass, and numerous 4-lane widening projects on US 93 between Wickenburg, Arizona, and Boulder City, Nevada.

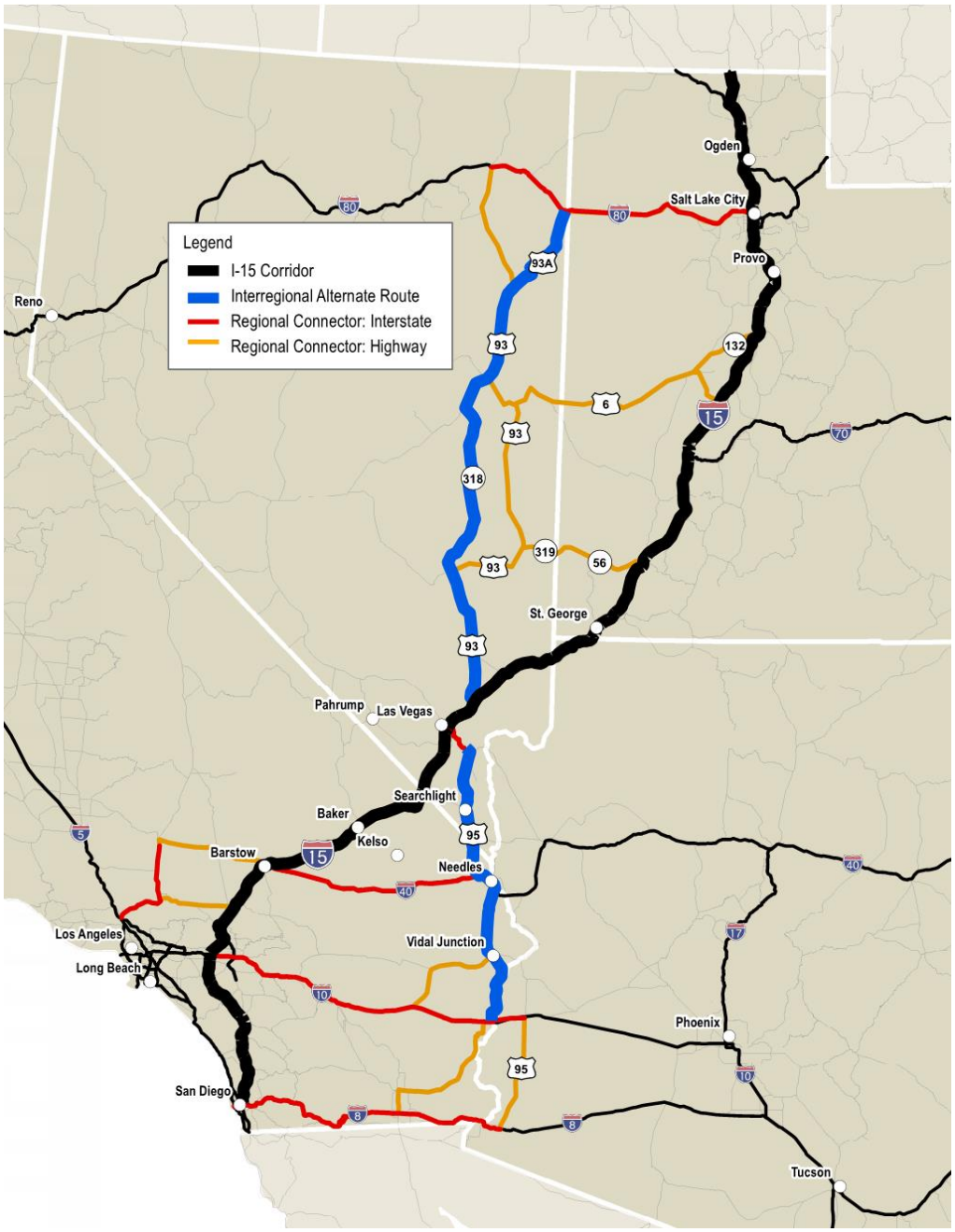

Figure 2: I-15 Alternate Route

The need for a new north-south transportation connection is so vital that Congress identified the US 93 Corridor between the Phoenix and Las Vegas metropolitan areas as Interstate 11. For decades, the federal government has recognized the importance for a north-south transportation corridor through the Intermountain West. The Moving Ahead for Progress in the 21st Century (MAP-21), signed into law on July 6, 2012, designates US 93 as a future Interstate 11 between the Phoenix and Las Vegas metropolitan areas. In approving the I-11 designation, Congress recognized the need for and importance of an interstate link between the Phoenix and Las Vegas metropolitan areas. Although this designation does not guarantee funding, it elevates the importance of the proposed route, improving the chances for obtaining federal funds as the project warrants further consideration.

Following this designation, the Fixing America's Surface Transportation Act (FAST Act), signed into law on December 4, 2015, further advanced the I-11 designation by identifying the US 95 corridor from Las Vegas and I-80 as future I-11. This focuses future I-11 to the west side of the state and away from US 93. However, NDOT has noted continued investment in US 93 as an important north/south corridor through the state.

2.2.6 Southbound Interstate 515 Improvement Study (2017)

The Southbound I-515 Improvement Study was initiated by the City of Henderson to study the deteriorated conditions of traffic operations, including low travel speeds and long queues, on the interstate system-to-system ramp from southbound I-515 to westbound I-215. Three separate alternatives were analyzed, of which, Alternative 3 was selected because it has a slightly lower cost, a longer operational life cycle, and requires no additional right-of-way. However, this alternative will require the closure of the freeway access from Lake Mead Parkway to Gibson Road. An illustration of Alternative 3 can be viewed in **Figure 3**.

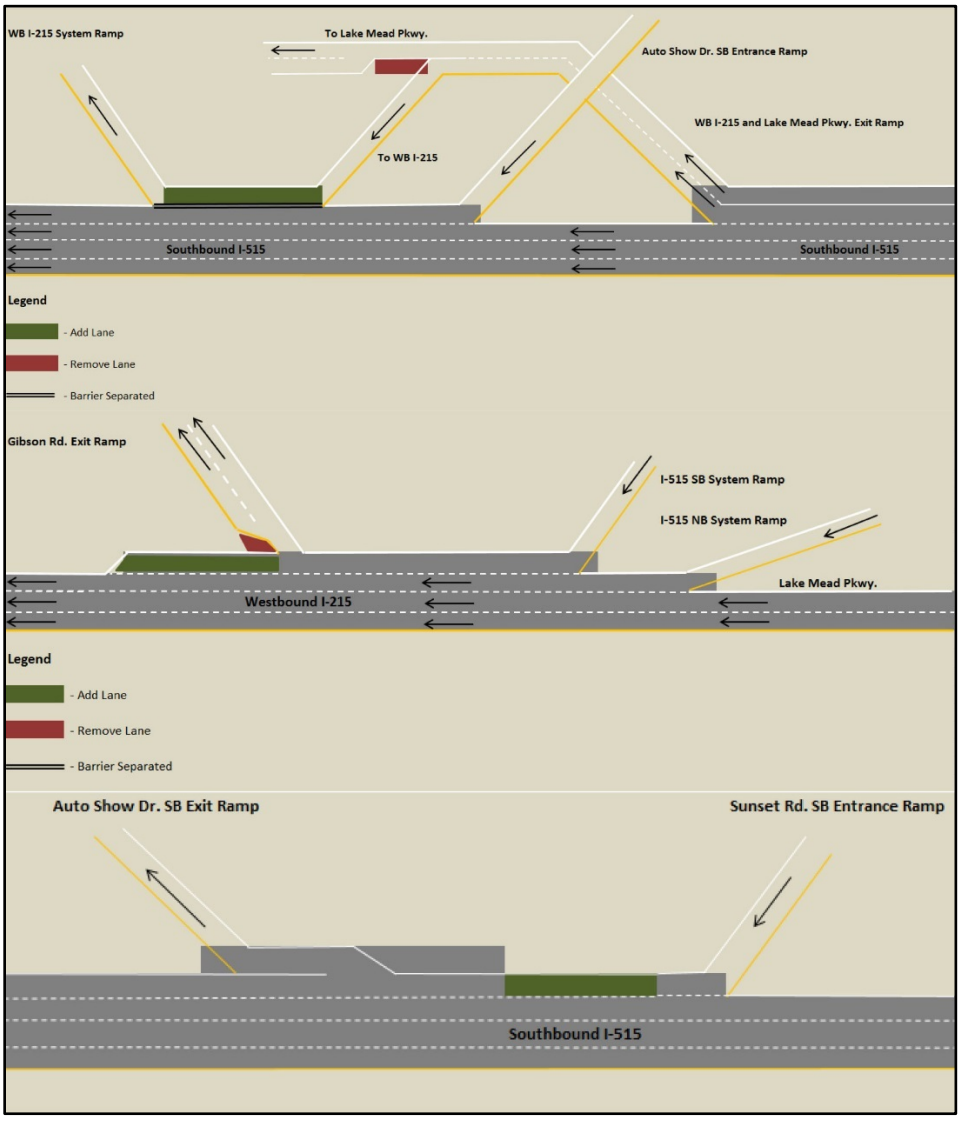

Figure 3: Interstate 515 Improvement Study Alternative 3

Based on the analysis, this study provides the following recommendations:

- The south to west one-lane system ramp cannot accommodate existing and future demand, therefore all concepts including a one-lane system ramp may be excluded from further evaluation.
- The I-515 and I-215 are part of the interstate system. Any changes to a federal facility will require the compliance with the FHWA requirements including the environmental clearance and the change in control of access approval.
- The compliance with the FHWA requirements above will require the evaluation of future no build and build alternatives. Alternative 3, or a variation of, is recommended to be carried forward in the evaluation of future conditions using the new 2040 RTC Travel Demand Model forecast.
- Alternative 3 is sensitive to the increase of volumes on EB and WB Lake Mead Parkway and NB I-515 to WB I-215. Therefore, additional 2-lane concept alternatives for these movements may need to be developed to handle longer term growth, depending on the future forecasting provided by the 2040 Travel Demand Model.
- Alternative 3 is not expected to have significant environmental impact except for the closure of WB Lake Mead Parkway to Gibson Road movement which can be accommodated by the local roadway network. Other two-lane ramp concepts presented in this report might have bigger environmental implications and require additional right-of-way.

2.2.7 NDOT Automated/Connected Vehicle Policy Framework (Ongoing)

NDOT is developing a concise vision and a collaborative policy framework for autonomous and connected vehicle initiatives. The purpose of this effort is to establish policy, standards, legislation, and innovations that will help advance automated and connected vehicle technology in Nevada. The results of this study will identify potential strategies rather than traditional projects, and though the recommendations may not be specific to US 93, the results are important to consider for upcoming work on US 93 throughout the state.

2.2.8 RTC On Board (Ongoing)

The RTC is currently developing a comprehensive transit plan for Southern Nevada. This long-range plan will identify how enhancements to the current bus system, new high capacity transit services, and emerging transit technologies can improve future mobility and accessibility for the region's residents and visitors. This study will also encourage transit supportive land use, identify priority transit investments, and develop a coordinated long-range transit plan focused on bus rapid transit, modern streetcars, and light rail.

2.2.9 RTC Transportation Investment Business Plan (2015)

The RTC, in coordination with the Las Vegas Convention and Visitors Authority (LVCVA), completed the Transportation Investment Business Plan in December 2015, which is a comprehensive blueprint for developing a modern transportation system in the core of Las Vegas, providing transportation and infrastructure recommendations (freeway, surface roadway, pedestrian, and high-capacity transit) for Las Vegas' Resort Corridor and the surrounding areas. These recommendations are meant to alleviate congestion and improve connectivity in a high-growth area that attracts millions of visitors a year.

The Transportation Investment Business Plan (TIBP) includes over 55 policy and infrastructure recommendations. Recommendations to the I-515/US 93/US 95 corridor include the construction of new interchanges at I-515/City Parkway (additional access to Downtown Las Vegas and Symphony Park) and I-515/Maryland Parkway (additional access to Downtown Las Vegas and Cashman Center). This study also includes a variety of vehicular, pedestrian, and transit improvements to the local roadway network which may relieve congestion on I-515 through the Resort Corridor area.

2.2.10 RTC of Southern Nevada Regional Goods Movement Master Plan (2015)

The movement of freight has a major impact on the mobility and economy of the Southern Nevada region, especially the Las Vegas metropolitan area. This study provides a snapshot of the region's freight transportation system, a forecast of future freight demand, and recommendations to address regional freight deficiencies. A series of high-level strategies were recommended, with specific projects identified to meet each goal. Those that impact the US 93 corridor, either directly or indirectly, include:

- *Develop an integrated logistics center (freight village) with access to major highways and railroads*. While various sites were explored, a specific site not was selected at this point in time.
- *Support the implementation of the I-11 Corridor through Southern Nevada*. I-11 utilizes US 93 for its connection from Phoenix, AZ to Las Vegas, NV.
- *Implement programmed freeway projects.* Trucks prefer to travel by freeways whenever possible, even travelling longer distances to maintain travel time reliability. Therefore, any and all improvements to the freeway system will have a positive impact on trucks. Implementation of this measure includes continuing, and possibly re-prioritizing, projects in the Regional Transportation Plan, including various improvements to US 93 such as corridor widening and interchange reconstruction.
- *Construct capacity and operational improvements to the arterial network that address the first and last mile connections.* Projects that may impact movement on US 93 include constructing a system interchange at US 93/I-15, constructing I-11 (including the Boulder City Bypass), and road widenings along US 93.

2.2.11 NDOT Southern Nevada High-Occupancy Vehicle Plan (2015)

The High-Occupancy Vehicle (HOV) Plan focused on HOV lanes throughout the Las Vegas Valley. The segments pertaining to the US 93 corridor include incorporating I-515 from I-215 to I-15 with one HOV lane in each direction, direct-access local ramps at Maryland Parkway/I-515 (ramps to/from in both directions), and segments of I-15 which are covered in the I-15 Critical Corridor Plan.

2.3 US 93 Improvement Projects

2.3.1 Completed Projects

The I-15 North Design-Build (this section is also US 93) from the Spaghetti Bowl to Craig Road (approximately 6-miles) was completed within recent years, which widened the roadway to a six-lane section. This widened section is currently under construction from Craig Road to the Speedway interchange.

2.3.2 Planned/Programmed Projects

Building on the recent construction projects on US 93, NDOT has several planned and programmed projects that are split into incremental phases for which funding can be secured. **Table 2** shows projects programmed in the 2018 State Transportation Improvement Program (STIP), which identifies funding for projects in the next 5 years. These projects are in different stages of planning, design, or construction, and funding sources and availability vary. The entire STIP can be viewed at: https://estip.nevadadot.com/.

Table 2: 2018 Statewide Transportation Improvement Program (STIP)

Title	Limits	Begin	End	Total Miles	Total Programmed
US 93 Fog Seal Coyote Springs	From CL County Line To 24 Miles North	0	24	24	$ 74,060
US 93 Chip Seal Alamo	From Sharp Lane to Turtle Walk Road	24	39.7	15.7	$ 397,000
US 93 Chip Seal Between SR 232 and SR 229	From SR 232 to 5 Miles South of SR 229	44.1	54.59	10.49	$ 317,102
US 93 Chip Seal Henry	From 3 Miles North of Wilkins Montello Road To 6 Miles South of Henry	102.2	112.8	10.56	$ 320,000
US 93 Chip Seal Salmon Falls Creek	From 5 Miles South of SR 229 to 32 Miles North of Wilkins Montello Road	116.69	131.4	14.71	$ 545,233
US 93 Passing Lane Design	From Bar Hill Road to Jackpot	80	140	60	$ 2,000,000
State Entrance Sign Jackpot	From NV/ID Stateline MP EL 141.76	141.76	141.8	0	$ 248,750
US 93 Chip Seal	From Muleshoe Valley Road to WP County Line	158	172	14	$ 354,000

3.0 Existing and Future Conditions

3.1 Corridor Performance

The following subsections document the performance of US 93 in each of the One Nevada Goal Areas. Based on the existing and future data, each segment received a rating for each performance measure. These ratings form the basis for identifying corridor needs, as documented in Section 4.

3.1.1 Enhance Safety

3.1.1.1 Traffic Fatalities

Performance Measure Target: Zero Fatalities

From 2012 to 2016, there were 39 fatal crashes on US 93, resulting in 41 fatalities. The 41 fatalities exclude fatalities that occurred in Segment C because this segment has been covered in the I-15 Critical Corridor Plan. Each segment has a crash rating calculated by the number of fatalities per mile over the 5-year period, as shown in **Table 3**. The statewide goal aims for zero fatalities, therefore a crash rate of zero. For this analysis, a "good" rating is a zero fatal crash rate, while a "fair" rating is any rate below the statewide average, and a "poor" rating is any rate above the statewide average. Additionally, the Annual Average Daily Traffic volume is an average of all NDOT count locations within each of the segments and the calculations can be viewed in **Appendix A**.

Segments A, B, D, E, and F are all classified as "Other Principal Arterials" which have a statewide average fatality rate of 1.720 within the urban setting and 2.070 within the rural setting. Therefore, Segment A, Segment B, Segment D, Segment E, and Segment F all receive a fair rating since they are less than the statewide average.

Crash locations are identified in **Figure 4**, showing that safety impacts span the entire US 93 corridor and are not only focused in the urbanized area. Albeit, the greatest density of fatal crashes on the map do occur within the urban core.

Table 3: Fatal Crash Rates per 100 Million Vehicle Miles Traveled on US 93

Segment	Fatal Crashes	Annual Average Daily Traffic	Segment Length (mi)	Crash Rate	Statewide Average Crash Rate	Rating
A	2	30,840	12.5	0.28	2.070	Fair
B	8	130,083	20.5	0.16	1.720	Fair
C	See I-15 Critical Corridor Plan					
D	14	1,809	260.5	1.63	2.070	Fair
E	9	4,556	137	0.79	2.070	Fair
F	6	4,000	68	1.21	2.070	Fair

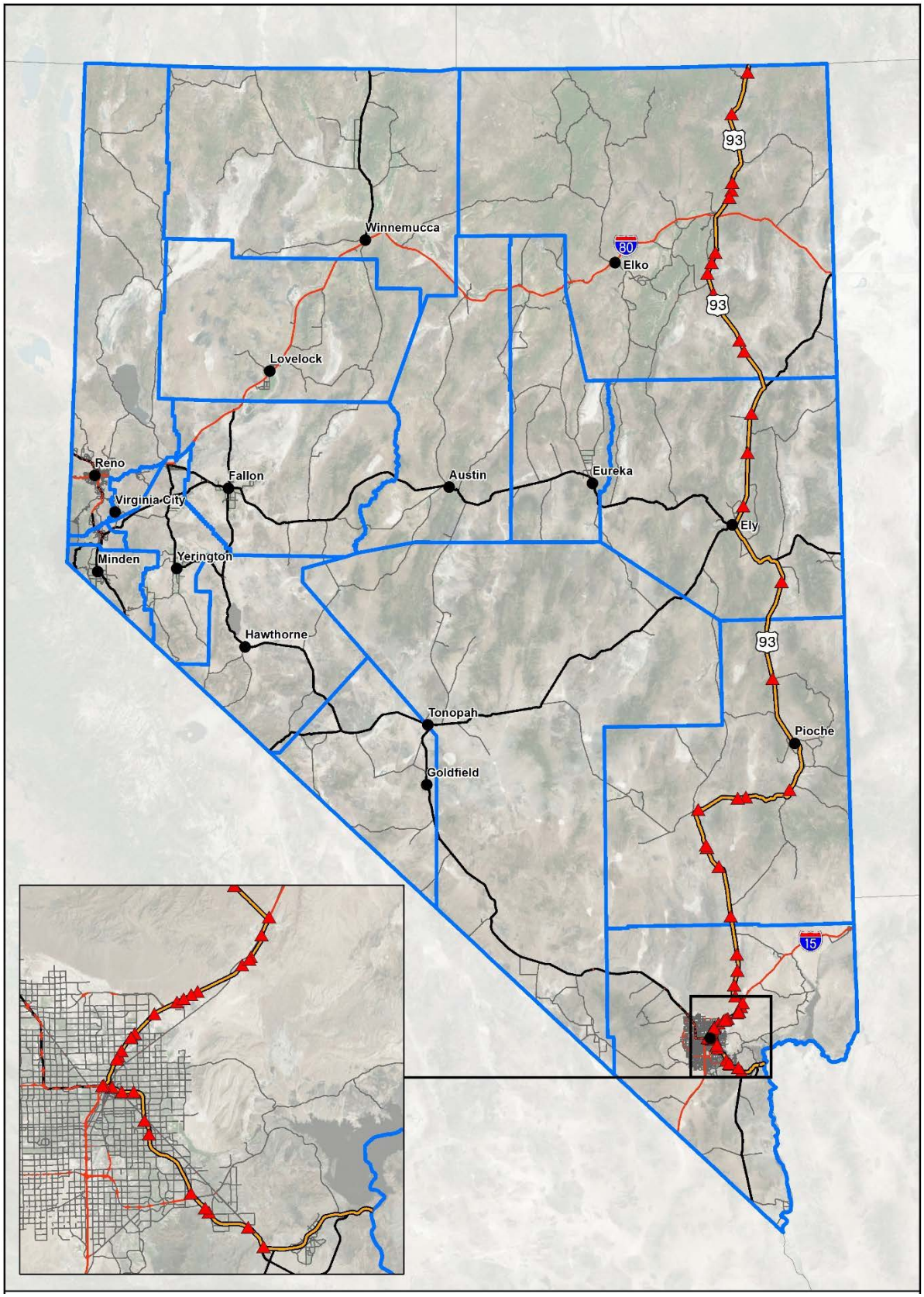

Figure 4: US 93 Fatal Crashes

3.1.2 Preserve Infrastructure

3.1.2.1 Bridge Sufficiency Ratings

Performance Measure Target: Zero "Poor" Bridge Sufficiency Ratings

NDOT ranks the best among states based on bridge condition, in a 2018 study by the American Road and Transportation Builders Association (ARTBA 2018). There are 57 bridges on US 93 including those on I-515; of which the deck, superstructure, and substructure are all rated. Based on the lowest rating of the three elements, 24 bridges are classified as "good" condition, 31 bridges are classified as "fair" condition, and 2 bridges are classified as "poor" condition. The ratings are derived by structural engineers from physical inspection reports and can be viewed in **Table 4**. Only two bridges are considered in "poor" condition, which are located on I-515 at Gibson Road and Desert Inn. **Table 5** summarizes the bridge sufficiency ratings for each segment.

Table 4: US 93 Bridge Sufficiency Ratings

DESCRIPTION	STRUCTURE	STRUCTURE NUMBER	DECK RATING	SUPERSTRUCTURE RATING	SUBSTRUCTURE RATING	LOWEST RATING	BRIDGE SUFFICIENCY RATING
Meadow Valley Wash	US 93	B 219	7	7	7	7	GOOD
Meadow Valley Wash	US 93	B 220	6	6	6	6	FAIR
Salmon Falls Crk	US 93	B 232	7	7	6	6	FAIR
Salmon Falls Creek	US 93	B 658	7	7	6	6	FAIR
Meadow Valley Wash	US 93	B 704	6	6	7	6	FAIR
Meadow Valley Wash	US 93	B 705	7	7	7	7	GOOD
Comet Crk	US 93	B 706	7	7	7	7	GOOD
Duck Creek	I 515, US95, US93	B1455	6	7	7	6	FAIR
Canyon	US 93	B2700	7	8	7	7	GOOD
Colorado River	US 93	B2704	7	7	7	7	GOOD
UPRR	US 93A	G 132	7	8	7	7	GOOD
UPRR	US 95	G 224	7	8	7	7	GOOD
SPRR	US 93	G 229	7	8	7	7	GOOD
UPRR, Access Rd. & Ditch	I-515, US95, US93	G1463	6	7	7	6	FAIR
UPRR	I 515, US95, US93	G1465	7	8	7	7	GOOD
UPRR	I-515, US95, US93	G1470	7	7	7	7	GOOD
Twain Avenue	I 515, US 95, US 93	H1451	6	7	7	6	FAIR
FAU 611/ Mountain Vista	I-515, US95, US93	H1454	6	7	7	6	FAIR
Foothills Dr	I-515, US95, US93	H2032N	6	7	7	6	FAIR
Foothills Dr	I-515, US95, US93	H2032S	7	7	7	7	GOOD
Flamingo Wash	I 515, US95, US93	B1448	6	6	7	6	FAIR

DESCRIPTION	STRUCTURE	STRUCTURE NUMBER	DECK RATING	SUPERSTRUCTURE RATING	SUBSTRUCTURE RATING	LOWEST RATING	BRIDGE SUFFICIENCY RATING
UPRR & Main St	I 515, US95, US93	G 947	5	6	7	5	FAIR
UPRR, Access Rd.& Ditch	I-515, US95, US93	G1463	6	7	7	6	FAIR
F Street	I-515, US95, US93	H 946	7	7	7	7	GOOD
Pecos Dr	I-515, US95, US93	H1412	6	7	7	6	FAIR
28th Street	I-515, US95, US93	H1441	6	7	7	6	FAIR
Mojave Road	I-515, US95, US93	H1442	6	6	7	6	FAIR
Stewart Ave	I-515, US95, US93	H1443	6	7	7	6	FAIR
Wyoming Avenue	I-515, US95, US93	H1445	6	7	7	6	FAIR
Sahara Avenue	I-515, US95, US93	H1446	6	7	6	6	FAIR
SR590 Desert Inn Rd	I-515, US95, US93	H1450	4	7	7	4	POOR
Twain Avenue	I-515, US95, US 93	H1451	6	6	7	6	FAIR
Viking Rd	I-515, US95, US93	H1457	6	6	7	6	FAIR
Gibson Rd	I-515, US95, US93	H1460	6	4	7	4	POOR
Greenway Rd	I-515, US95, US93	H1468	6	7	7	6	FAIR
Warm Springs	I-515, US95, US93	H1836	6	7	7	6	FAIR
SR604 & Maryland Pw	I-515, US95, US93	I 947	5	7	7	5	FAIR
Eastern Ave	I-515, US95, US93	I1440	7	7	7	7	GOOD
SR587 Charleston Ave	I-515	I1444	7	7	7	7	GOOD
SR582 Boulder Hwy	I-515, US95, US93	I1449	6	7	7	6	FAIR
SR593 Tropicana Bl	I-515, US95, US93	I1453	6	8	7	6	FAIR
Sunset Rd	I-515	I1459	6	7	7	6	FAIR
SR564 Lake Mead Pkwy	I-515, US95, US93	I1464	6	8	7	6	FAIR
College Dr	I-515, US95, US93	I1469	7	8	8	7	GOOD
RR Pass Casino Blvd	US93NB	I2870N	8	7	7	7	GOOD
RR Pass Casino Blvd	US93SB	I2870S	8	7	7	7	GOOD
Hoover Dam Lower Access	US 93	H2701	7	7	7	7	GOOD
Old US 93	US 93	H2702	6	7	7	6	FAIR
Old US 93	US 93	H2703	7	7	7	7	GOOD

DESCRIPTION	STRUCTURE	STRUCTURE NUMBER	DECK RATING	SUPERSTRUCTURE RATING	SUBSTRUCTURE RATING	LOWEST RATING	BRIDGE SUFFICIENCY RATING
SR172 Hoover Ac Rd	US 93S BUS ROUTE	H3181	8	8	8	8	GOOD
SR592 Flamingo Rd	I-515, US95, US93	I1452	7	6	7	6	FAIR
US 95	US 93N	I1505N	6	7	7	6	FAIR
US 95	US 93S	I1505S	6	7	7	6	FAIR
Hoover Dam Access Road	US 93	I2699	7	7	7	7	GOOD
Rr Pass Casino Blvd	US93NB	I2870N	8	8	8	8	GOOD
US 93	WILDLIFE OVERPASS	P2934	N	7	7	7	GOOD
US 93	WILDLIFE OVERPASS	P2940	N	8	7	7	GOOD

Table 5. Bridge Sufficiency Rating Scale

Rating	Bridge Sufficiency Rating	Total No. on US 93	Segment Rating
Good	>80	24	A, D, E, F
Fair	50-80	31	N/A
Poor	<50	2	B

Source: NDOT Performance Management Report, 2017d

3.1.2.2 Pavement Condition

Performance Measure Target: 95% Pavement in "Fair" or "Better" Condition
Pavement Serviceability Index (PSI) rating is a measure used to identify the performance of asphalt pavement. PSI is calculated using pavement roughness measurements and formulas to quantify pavement distress. The rating scale is as follows:

- 0-2 = very poor
- 2-3 = poor
- 3.00-3.49 = fair
- 3.5-3.99 = good
- 4.0-5.0 = very good

A little over 890-miles were rated along US 93, of which 3.82% (34-miles) are rated as "POOR" or "VERY POOR". Similarly, 96.18% (856.5-miles) are rated as "FAIR", "GOOD", and "VERY GOOD". Therefore, the performance target of pavement in "FAIR" or better condition is met.

3.1.3 Optimize Mobility

3.1.3.1 Travel Time Reliability, Corridor Chokepoints

Performance Measure Target: Average Travel Speeds 0 to 5 Miles Per Hour Below Posted Speed Limit
Average travel speeds provide information on travel time reliability over a long period. INRIX data was used to determine the average travel speed for all Tuesdays, Wednesdays, and Thursdays in 2017 at each count location, in the northbound and southbound directions. Daily speeds were used rather than peak hour speeds, and northbound and southbound information was combined for each count location. The lowest average speed in each segment was used to determine the rating for the entire segment, as shown in **Table 6**. The ratings are broken down based on the minimum average travel speed as it relates to the posted speed limit.

Table 6. Mobility Ratings

Rating	Criteria for Minimum Average Travel Speed	Segment Rating
Good	0-5 MPH below posted speed limit	N/A
Fair	5-10 MPH below posted speed limit	F
Poor	>10 MPH below posted speed limit	A, B, D, E

Figure 5 illustrates the speed ratings and annual average daily traffic (AADT) for each segment for the entire US 93 corridor. Segment A is primarily categorized as a poor speed rating; Segment B is primarily categorized as a good rating (although the segment approaching the Spaghetti Bowl is categorized as a poor rating); Segment C is described in the I-15 Critical Corridor Plan; Segment D is generally split between a fair rating and a poor rating; Segment E is generally split between a fair rating and a poor rating; and Segment F is primarily categorized as a fair rating. It is anticipated that Project NEON and the Boulder City Bypass will improve travel times in Segment A and Segment B; however, emphasis should be placed on Segment D and Segment E to improve travel times through these segments.

3.1.4 Transform Economies

US 93 is the shortest and most direct route between Las Vegas, NV and Phoenix, AZ, which are two of the fastest-growing cities in the United States. Furthermore, US 93 ultimately connects to the Canadian border north of Nevada via Idaho and Montana through important agricultural lands and natural attractions.

3.1.4.1 Access to Economic Generators

Performance Measure Target: Level 3 Access to Economic Generators
Major Economic Generators, for the purposes of this document, are considered population or employment centers. This section is intended to evaluate US 93 as an access point to Major Economic Generators. The closer these generators are to US 93, the more critical the role of the corridor. This measure helps to weigh the priority of different segments rather than identify specific transportation deficiencies as the previous criteria have done. The rating descriptions are shown in **Table 7**.

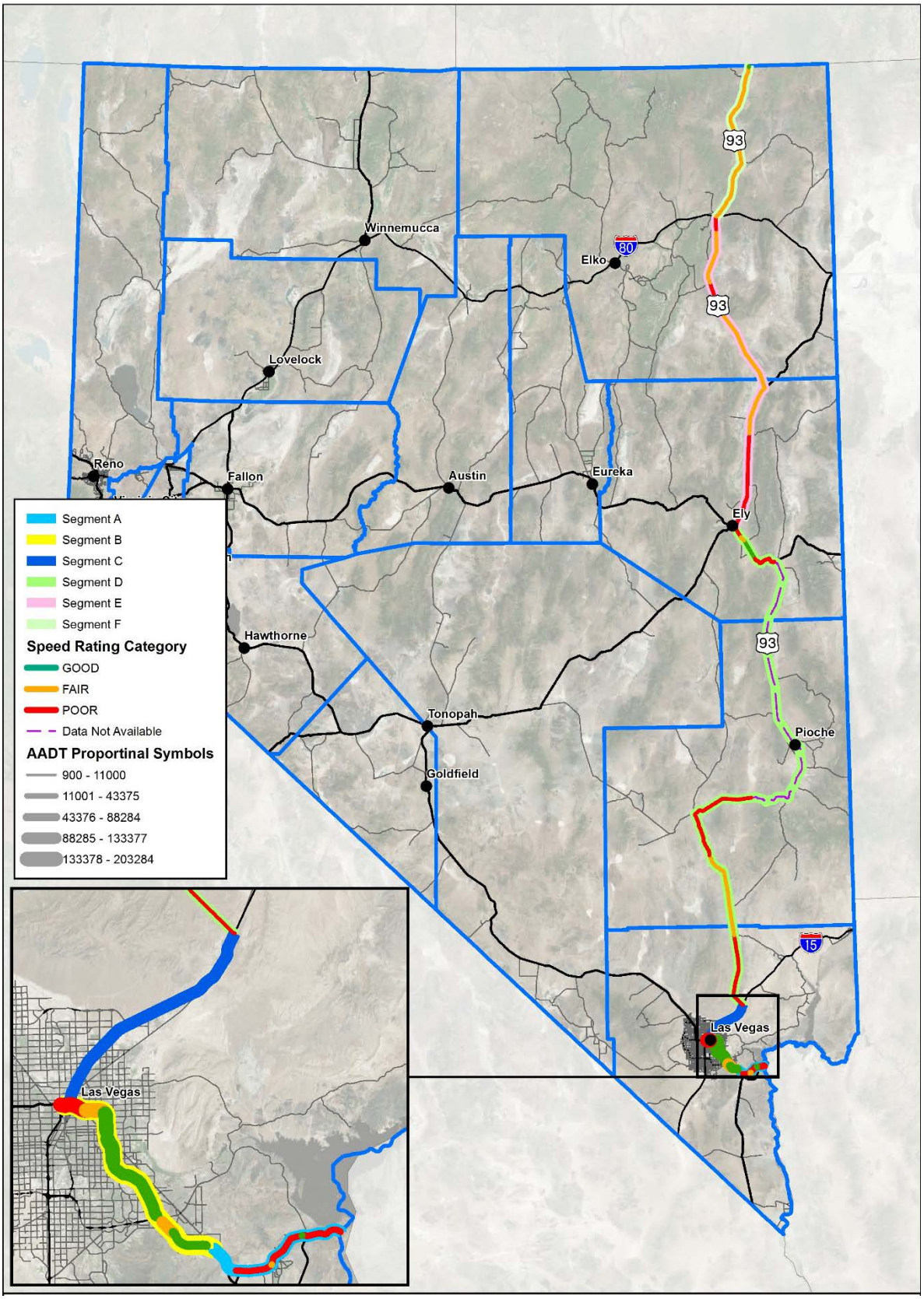

Figure 5: US 93 Speed Ratings

Table 7: Access to Economic Generators Rating Scale

Rating	Criteria for Access to Economic Generators	Segment Rating
Level 3	Major economic generators are located adjacent to segment	B
Level 2	Segment is critical connection between two or more major economic generators	A, D
Level 1	Segment is not critical to connect two or more major economic generators	E, F

Segment A is an important connection between Las Vegas, NV and Phoenix, AZ. However, no major economic generators are adjacent to this US 93 segment, therefore it is considered Level 2 Access to Economic Generators. Segment B provides access to Downtown Henderson and Downtown Las Vegas; therefore, it is considered Level 3 Access to Economic Generators. Segment C is described in the I-15 Critical Corridor Plan. Segment D provides access to the growing Apex Industrial Park, which is adjacent to this segment, and is necessary for overall regional connectivity; therefore, it is considered Level 2 Access to Economic Generators. Segment E and Segment F are not adjacent to any major economic generators and are not critical to connect major economic generators, therefore they are considered Level 1 Access to Economic Generators.

3.1.5 Foster Sustainability

Nevada DOT has been on the leading edge of embracing technology to support transportation evolution. The ongoing Automated and Connected Vehicle Policy Framework Study mentioned previously will continue to guide Nevada's technology future. For the purposes of this analysis, sustainability was measured by access to alternative fuels which is representative of a commitment to sustainable transportation facilities. This section aims to identify the progress to date toward a sustainable transportation system, and potential areas for future investment.

Infrastructure improvements cannot keep up with the rate at which vehicle technology is advancing. However, the one thing that is known is that wireless connectivity is important, and so communication capabilities built into the roadway system will become increasingly critical. On US 93, approximately half of the state of Nevada does not have cellular coverage, therefore improved speed and future access should be considered in any future projects.

3.1.5.1 Access to Alternative Fuels

Performance Measure Target: Level 3 Access to Alternative Fuels
In November 2016, the Federal Highway Administration (FHWA) announced 55 routes that would serve as the basis for a national network of Alternative Fuel Corridors, spanning 35 states. The network is nearly 85,000 miles long, and more miles are expected to be added in the future to accommodate electric, hydrogen, propane, and natural gas vehicles, as additional fueling and charging stations are built. The goal of this system is to help drivers identify routes that will help them refuel and recharge.

US 93 in Nevada was not designated as an Alternative Fuel Corridor; however, possible points of alternative fuel access include:

- Segment A does not currently have any charging stations, but is a short distance from charging stations within Segment B.

- Segment B has a vast amount of public and private stations, including a Tesla Motors Supercharger Station within the Downtown Project Parking Garage.
- Segment C is described in detail in the I-15 Critical Corridor Plan.
- Segment D has multiple charging stations spread out widely along US 93, mostly at RV Parks.
- Segment E has a few charging stations located around Ely, NV.
- Segment F does not currently have any charging stations, but is a short distance from a charging station located near the I-80 interchange in Wells, NV.

The rating scale provided in **Table 8** varies from the FHWA criteria in that it considers private charging stations. Known electric charging stations are illustrated in **Figure 6**.

Table 8: Access to Alternative Fuels Rating Scale

Rating	Criteria for Access to Alternative Fuels	Segment Rating
Level 3	More than 5 charging stations available in segment or per 50 miles	B
Level 2	1 to 5 charging stations available	D, E
Level 1	No charging stations available	A, F

Based on the rating Scale, Segment B has Level 3 for Access to Alternative Fuels, Segment D and Segment E have Level 2, and Segment A and Segment F are rated as a Level 1. Additional investment in charging stations would be beneficial in all six segments, however particular attention should be given to Segment A and Segment F.

3.1.6 Connect Communities

Transportation provides an important social role in connecting people from different communities. The Southern Nevada Strong Regional Plan has increasing transportation choice as a part of the overall vision of the region. According to the plan, expanding transit systems and access to transit can provide more efficient and affordable travel choices for residents, workers, and visitors. The region is currently the only one of its size in the region without a high-capacity transit system.

The analysis for this section is based on access to other modes of travel within or off of US 93.

3.1.6.1 Access to Alternative Modes

Performance Measure Target: Transit Availability

The RTC operates the local transit system in Clark County with one major transit hub located near US 93 Segment B (Bonneville Transit Center in Downtown Las Vegas). Many local and regional bus routes operate within the Las Vegas metropolitan area including Route HDX (on Sections A and B) and Route DVX (on Section B and Section C). Thus, Segments B and C are a Level 3 and Segment A is Level 2. Segment D, Segment E, and Segment F are heavily focused on the automobile as the development density does not support local transit systems. Due to the lack of multi-modal facilities, Segment D, Segment E, and Segment F are rated Level 1. A summary of the transit availability ratings can be seen in **Table 9**.

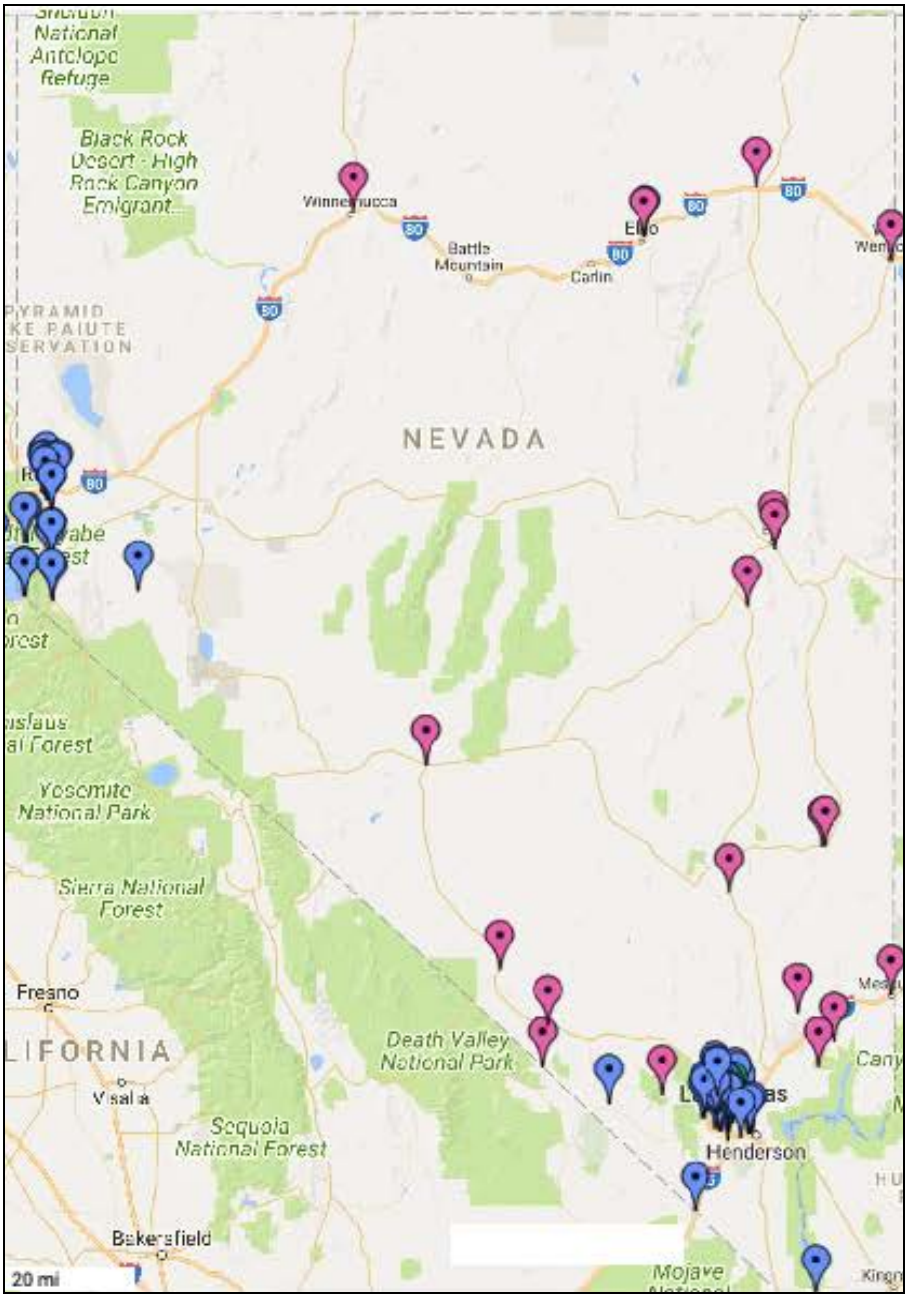

Figure 6: Nevada Charging Stations

Table 9. Access to Transit Availability

Rating	Transit Availability	Segment Rating
Level 3	More than 1 transit option in the segment	B
Level 2	1 transit option in the segment	A
Level 1	No transit option in the segment	D, E, F

In addition to bus options, there are bike-share stations in downtown Las Vegas that are within one-mile of US 93 in Segment B and Section C, as well as, a robust system of sidewalks and bike lanes throughout the Las Vegas Valley. Similarly, Boulder City and Henderson in Segment A have an overall network of bicycle and pedestrian facilities, including on US 93 in Boulder City. Given this existing infrastructure, Segments A, B, and C are rated as Level 3.

Segment D, Segment E, and Segment F are all rural and generally lack bicycle and pedestrian facilities. However, US 93 is the "Main Street" to several small communities between Las Vegas and the Idaho border that could benefit from complete streets applications, if not currently in place. **Table 10** summarizes the existing facilities within these small towns and if additional facilities should be considered:

Table 10. Segment D Bicycle and Pedestrian Facilities

Community	Existing Facilities	Complete Streets Opportunities?
Caliente	Sidewalk through a majority of town. No bicycle facilities	Yes
Ely	Sidewalk through parts of town with large gaps. No bicycle facilities	Yes
McGill	Sidewalk through parts of town with large gaps. No bicycle facilities	Yes
Wells	Sidewalk through parts of town with large gaps. No bicycle facilities	Yes
Jackpot	Sidewalk through a majority of town. No bicycle facilities	Yes

Given the lack of bicycle and pedestrian facilities and the numerous opportunities to incorporate complete street elements, Segment D, Segment E, and Segment F are all rated as Level 1. **Table 11** summarizes the access to bicycle and pedestrian facilities in each segment.

Table 11. Access to Bicycle and Pedestrian Facilities

Rating	Bicycle and Pedestrian Facilities	Segment Rating
Level 3	Complete network of bike/ped facilities on or adjacent to US 93	A, B
Level 2	Incomplete network of bike/ped facilities on or adjacent to US 93	N/A
Level 1	Little to no bike/ped facilities on or adjacent to US 93	D, E, F

3.2 Overall Opportunities and Constraints

The inventory of existing and future conditions has identified several opportunities and constraints relative to the performance of the US 93 corridor. **Table 12** shows key takeaways of this analysis.

Table 12: US 93 Corridor Performance – Key Takeaways

One Nevada Plan Goal	US 93 Performance Measure	Summary
Enhance Safety	Traffic Fatalities	Safety concerns span the entire US 93 corridor. The vast majority of the mileage is through rural and sparsely populated areas, however the urban portions of both US 93 and the routes that are shared including segments of I-15 and I-515 are within heavily congested urban areas. Current construction projects (notably Project Neon and I-15/US 93 widening from Speedway to Garnet) will address some of the safety concerns but further analysis should be conducted to determine what improvements might help improve the overall safety of US 93 in the rural sections, including passing lanes and safety enhancements.
Preserve Infrastructure	Bridge Sufficiency Ratings	There are 57 bridges along the US 93 corridor including I-515. All but 2 bridges are in Fair or Good condition. I-515 at Gibson and Desert Inn are rated in poor condition.
	Pavement Condition	3.82% of the US 93 lane miles are in poor condition. Maintenance projects are identified that that keep good pavements good.
Optimize Mobility	Travel Time Reliability	US 93 has a mixture of good, fair, and poor ratings regarding travel time reliability. The five segments analyzed for this Critical Corridor Plan (A, B, D, E, F) each include segments with poor travel time reliability. It is anticipated that Project NEON and the Boulder City Bypass will improve travel times in Segment A and Segment B; however, emphasis should be placed on Segment D and Segment E to improve travel time through these rural segments with passing and climbing lanes.
	HOV Connectivity	Long-term HOV improvements identified in the Southern Nevada HOV plan. These include HOV lanes on the I-515 segment of US 93 with the addition of 1 HOV lane in each direction that will extend North on I-15 to Lake Mead Blvd. Direct access ramp connections would be provided at Maryland Pkwy and I-515.

Table 12: US 93 Corridor Performance – Key Takeaways

One Nevada Plan Goal	US 93 Performance Measure	Summary
	Access Management	US 93 is fully access controlled within the shared routes of I-515 and I-15 to Garnet Interchange. Throughout all other rural areas of the US 93 Corridor there are few turn lanes at access points with accel/decel lanes in areas of high speeds. Operational and safety benefits would be gained by installing these facilities where justified by engineering analysis.
	Land Use Planning	US 93 traverses a significant portion of publicly owned lands managed by the federal government. However, in the Las Vegas metro area, the vast majority of land is privately owned. Opportunities to provide infrastructure into adjacent lands where needed should be preserved.
	Truck Parking Needs	Currently, there are no truck parking facilities with amenities along US-93 between Garnet and Ely, more than 3.5 hours apart.
Transform Economies	Access to Economic Generators	US 93 is the shortest and most direct route between Las Vegas, NV and Phoenix, AZ, which are two of the fastest-growing cities in the United States. US 93 also connects the intermountain west all the way to the Canadian border. Therefore, the efficiency of US 93 is vital to local and regional economies.
Foster Sustainability	Access to Alternative Fuels	There are 11 business or government electric vehicle charging stations on US 93 north of I-15 on the most expansive and remote part of US 93. Charging opportunities are continuing to be developed with the AV/CV policy framework that is ongoing, and future efforts should continue to build Nevada's culture for technology.
Connect Communities – Multimodal Options	Access to Alternative Modes	Transit opportunities are robust within the Clark County area. Multi-modal access including pedestrians and bicyclists will improve with complete street projects planned in Ely and ADA upgrades in Jackpot. Wide shoulders along US-93 will accommodate bicycles across the state.

4.0 Project Identification

Based on the opportunities and constraints observed from the performance measures evaluation, along with known planned and programmed improvements, the following subsections outline five phases of critical projects for the US 93 corridor. These projects do not include routine maintenance efforts.

Figure 7 displays the typical Project Development Process, to understand the major steps each project takes from initial concept (planning) through construction (open to traffic). Planning work is generally completed for all projects listed below.

Figure 7: Project Development Process

4.1 Projects Currently Under Construction

The following projects are under construction currently, which will address some of the needs identified in the previous sections:

- Project NEON
- I-15 Widening, Craig Road to Speedway Boulevard
- I-15/US 93 Garnet Interchange Improvements
- Boulder City Bypass (I-11) – *completed and opened to traffic*

4.2 Near-Term Projects (0 to 5 Years)

The following projects are in the design and environmental review process, such that they could begin construction in the next 5 years:

- I-15/I-215 Interchange Phase 1
- I-515 at Charleston Boulevard Including Auxiliary Lanes
- I-515 NEPA
- I-515 Bridge Maintenance at Downtown Viaduct
- US 93/US 95 ITS FAST Package
- US 93 Fog Seal Coyote Springs
- US 93 Chip Seal Alamo
- US 93 Chip Seal Between SR 232 and SR 229
- US 93 Chip Seal Henry
- US 93 Chip Seal Salmon Falls Creek

- US 93 Passing Lane Design
- State Entrance Sign Jackpot
- US 93 Chip Seal

4.3 Mid-Term Projects (5 to 10 Years)

The following projects have been identified through previous studies or through the needs assessment in this Critical Corridor Plan as projects that would help achieve the performance targets for US 93, as well as broader statewide goals:

- I-15/I-215 Interchange Phase 2
- I-15 North Package 3 from Speedway Boulevard to US 93

4.4 Long-Term Projects (10 to 20+ Years)

The following projects have been identified through previous studies or through the needs assessment in this Critical Corridor Plan as long-term projects that could improve the US 93 corridor:

- I-15/I-215 Interchange Phase 3

4.5 Additional Needs

Identified Through Data Deficiencies

The following projects and concepts are identified from the deficiencies in the corridor performance analysis which are summarized in **Figure 8**. Deficiencies already addressed by current or planned projects and/or analyzed in existing studies are not included. Additional needs recommended for US 93 Segment C are included by reference from the I-15 Critical Corridor Plan. Some needs will require additional study and analysis to determine specific project(s). Needs that can be paired with other ongoing or future improvements in the vicinity should be combined where possible to reduce impacts on the traveling public.

- Conduct a Passing Lane and Safety Study on US 93 from I-15 to the Idaho border (Segments D, E, F) to improve travel time reliability. Incorporate recommended projects into the One Nevada Transportation Plan.
- Coordinate with Boulder City to identify opportunities for alternative fuel charging stations and identify opportunities in Segment F.
- Collaborate with counties along Segment D, Segment E, and Segment F through the County Tours process to identify potential opportunities for rural transit services and programs.
- Initiate a US 93 Rural Community Complete Streets Plan to identify opportunities for bicycle and pedestrian improvements in the communities identified in Table 10. Integrate recommendations into future preservation and/or other improvement projects.

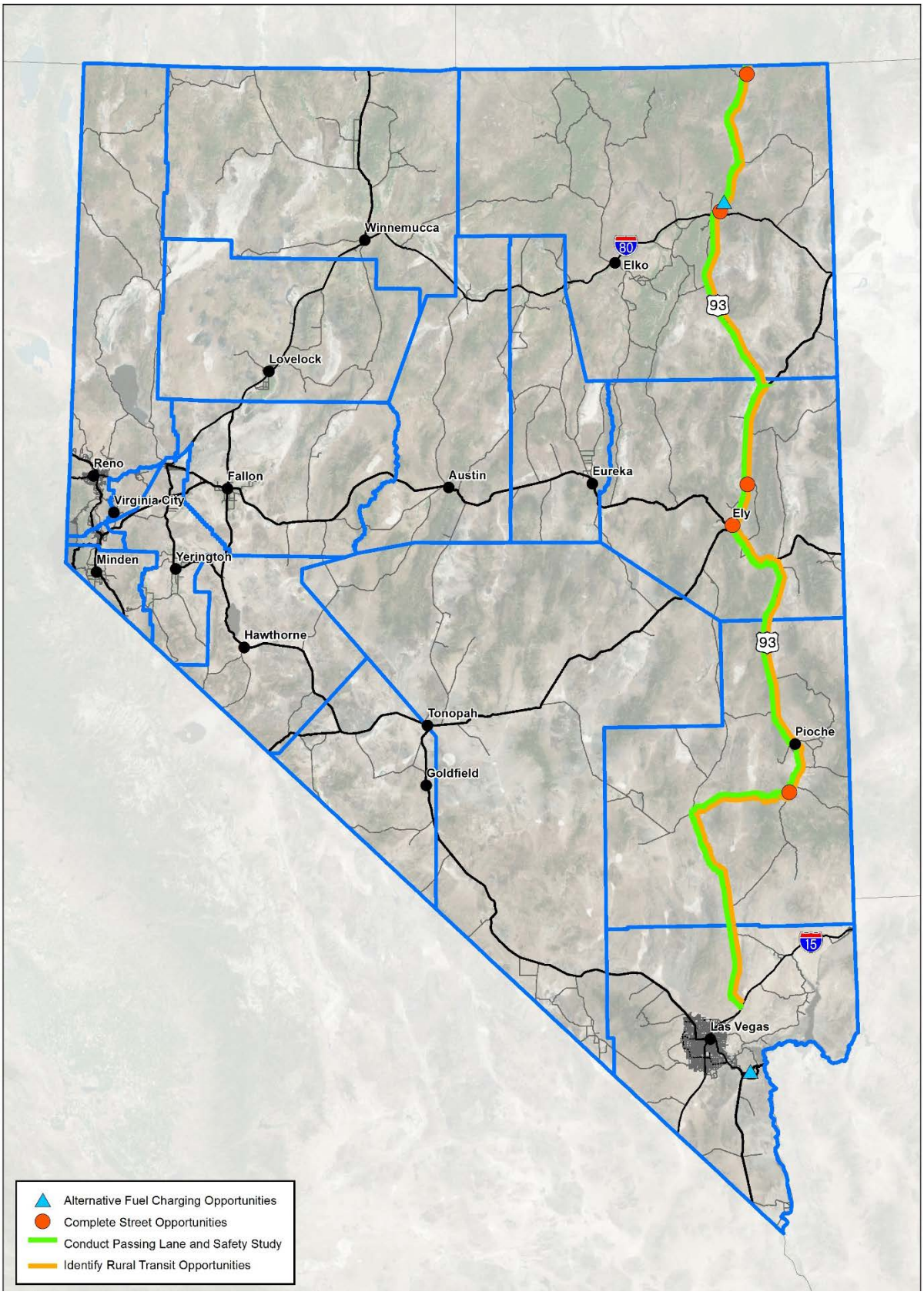

Figure 8: Projects and Concepts to Address Deficiencies

Identified Through Qualitative Analysis

In addition to the needs identified above, it is recommended that safety data continue to be monitored to ensure adequate performance. Furthermore, efforts to encourage freight rail expansion along US 93 should continue to be supported where feasible.

Identified Through Prior Study Recommendations

I-15 Corridor Alternate Route Study – The study identified existing conditions on alternative routes to the I-15 corridor that would need to be improved to meet minimum operating conditions in emergency situations. The needs listed below are relevant to the US 93 corridor.

- Vertical grade issues from 5 miles north of Apex to SR 168
- Widen to address narrow lanes, no shoulders, and tight horizontal curves along Pahranagat Lake
- Upgrade the intersection at US 93 and SR 318
- Add US 93 acceleration and deceleration lanes at cross streets in high speed areas

4.6 Development Triggered Needs

As outlined in the Apex to Mesquite and Moapa Valley Corridor Study, the US 93 corridor in the vicinity of I-15 in Segment D could be quickly impacted by potential developments. These developments include the following:

Apex Industrial Park is Southern Nevada's largest industrial park. Covering over 20,000 acres, the industrial park could eventually grow to approximately 20,000 employees at build-out (*NE Valley Transportation Network Study, 2018*). As of Spring 2018, plans to provide municipal water are currently underway and expected to be completed within the next two and a half years, which will likely support development of manufacturing, warehousing, and cultivation activities.

Coyote Springs is a master-planned community being developed in Lincoln County and Clark County, Nevada. The community was planned to cover 43,000 acres or 65 square miles. While mostly in Lincoln County, initial development was planned for the Clark County portion of the land. Coyote Springs is located between US 93 on the west and the Meadow Valley Mountains to the east. The only access to the community is via US 93 and SR 168. A golf course designed by Jack Nicklaus has been constructed, but additional work was put on hold due to the economic recession in the U.S. and complex legal issues. Currently, construction of the development had not begun, however, if initiated, this rural segment of US 93 will experience an increase in traffic.

Moapa River Indian Reservation is a Native American reservation located northeast of Las Vegas, near Moapa. It is the land-base for the Moapa Band of Paiute Native Americans, a local band of Southern Paiute Native Americans. The reservation consists of 71,954 acres. The reservation is crossed from northeast to southwest by the I-15 and is located just east of US 93. The reservation includes a 250 MW solar power generation facility which generates enough energy to power 111,000 homes and a master planned development has been suggested in the past. While no plans have been put forth, the potential impact of this level of development could affect US 93.

Due to uncertainties with Coyote Springs, Apex Industrial Park, Moapa River Native American Reservation, and other private development's project phasing and timelines, development of triggers that will prompt roadway improvements was recommended as part of the Apex to Mesquite and Moapa Valley Corridor Study. That is, when traffic volumes reach a certain point, the need for improvements is triggered. A major benefit of using triggers is in not attempting to tie roadway improvements to a certain year. This allows flexibility in the planning of roadway improvements by tracking actual development progress rather than relying on estimated phasing or build-out years. **Table 13** lists those needs that could be necessary should development in this area advance. It is recommended that NDOT review development activity in the area annually to determine if any of these needs may be triggered.

Table 13: Development Triggered Needs

Development	Improvement	Trigger
Coyote Springs	2 westbound through lanes+1 shared westbound left lane on US 93/I-15 southbound ramps	11,200 ADT at ramp intersection
Coyote Springs	Signal (when warranted) at US 93/I-15 southbound ramps	11,200 ADT at ramp intersection
Coyote Springs	Free-flow southbound right turn lane at Glendale Boulevard/SR 168	2,600 ADT Southbound
Coyote Springs	SR 168 (Glendale Blvd.)/I-15 Interchange Improvement	10,300 ADT, Approved Change in Control of Access Report
Coyote Springs	Climbing Lanes on US 93: approx. 5 miles in northbound and 5.6 miles in southbound directions	13,300 ADT, both directions
Coyote Springs	High-T unsignalized intersection at US 93/SR 168	14,300 ADT at intersection
Coyote Springs	Widen US 93 to 4 lanes from I-15 to SR 168	14,700 to 22,200 ADT
Coyote Springs	Consider alternatives for the northbound left turn movements from I-15 northbound to US 93	8,300 to 12,100 ADT on northbound off ramp
Coyote Springs	Free-flow dual ramps for the southbound right turn movements from US 93 to I-15 southbound	8,700 to 12,500 ADT on southbound ramp
Coyote Springs	Signalize or Grade-separate (northbound only) high-T intersection at US 93/SR 168	15,900 ADT at intersection
Coyote Springs	US 93 4-lane extension from SR 168 to Street A	14,400 to 20,700 ADT
Coyote Springs	Climbing lane along eastbound SR 168 between mileposts 19 and 20.3	7,550 ADT eastbound
Coyote Springs	US 93 4-lane extension from Street A to Street B	16,400 ADT
Coyote Springs	Approximately six miles of passing lanes along SR 168 in each direction	21,550 ADT
Coyote Springs	High-T unsignalized intersection at SR 168/Old Wagon Trail Parkway	5,750 ADT
Coyote Springs	SR 168 4-lane along Project Frontage	5,750 ADT
Coyote Springs	High-T unsignalized intersection at SR 168/Coyote Springs Parkway	8,050 ADT
Coyote Springs	Signalize (when warranted) High-T at SR 168/Coyote Springs Parkway	10,250 ADT
Coyote Springs	High-T unsignalized intersection at US 93/Street A	9,300 ADT at intersection
Coyote Springs	High-T unsignalized intersection at US 93/Street B	10,000 ADT at intersection
Coyote Springs	Signalize OR Grade-separate (northbound through only) High-T unsignalized intersection at US 93/Street A	11,000 ADT at intersection
Coyote Springs	Provide dual Eastbound left turn lanes on SR 168 at Coyote Springs Parkway	17,250 ADT at intersection
Coyote Springs	Signalize (when warranted) High-T at SR 168/Old Wagon Trail Parkway	9,750 ADT at intersection

Table 13: Development Triggered Needs

Development	Improvement	Trigger
Coyote Springs	Provide dual Eastbound left turn lanes at SR 168/Old Wagon Trail Parkway	16,450 ADT at intersection
Multiple Developments	Widen I-15 from existing 4-lane facility to 6 lanes	72,000 ADT (in both directions) add one lane in each direction
Multiple Developments	Widen I-15 from 6-lane facility to 8 lanes	108,000 ADT (in both directions) add one lane in each direction
Multiple Developments	Widen I-15 from 8-lane facility to 10 lanes	144,000 ADT (in both directions) add one lane in each direction
Multiple Developments	Widen I-15 from 10-lane facility to 12 lanes	180,000 ADT (in both directions) add one lane in each direction
Multiple Developments	Widen I-15 from 12-lane facility to 14 lanes	216,000 ADT (in both directions) add one lane in each direction
Multiple Developments	Widen US 93 from existing 2-lane facility to 4 lanes	22,000 ADT (in both directions) add one lane in each direction
Multiple Developments	Widen US 93 from 4-lane facility to 6 lanes	44,000 ADT (in both directions) add one lane in each direction
Multiple Developments	Upgrade ramp to current AASHTO standards, critical if there is a high truck percentage.	1,000 ADT on ramp
Multiple Developments	Improve ramp intersections, add turn lanes, modify traffic control, add signalization if warrants are met.	3,000 ADT on ramp
Multiple Developments	Widen and add lane to freeway ramps, intersection improvements, highly directional movements may require a direct connect ramp.	15,000 ADT on ramp
Multiple Developments	Consider direct connect ramp (flyover for high left turn volumes)	30,000 ADT on ramp
Multiple Developments	Intersection improvements on non-freeway routes	Add left and right turn lanes per requirements of NDOT's Access Management System and Standards (1999), signalize when warrants are met
Source: Apes to Mesquite and Moapa Valley Corridor Study		

Appendix A – Average Crash Rates by Segment

County	Segment	Number	Description	2017 AADT	Average
Clark	A	5220	N/A		30,840
		3150	N/A		
		1087	US 93, 415 ft N of Eagle Drive	34,000	
		0228	US 93, 850 ft S of Industrial Rd in Boulder City	28,000	
		0226	US 93, 840 ft S of Lake Mountain Dr in Boulder City	21,400	
		0225	US 93, 0.25 mi N of Lakeshore Rd	18,800	
		0230	US 93/US 95, 2.5 mi N of the railroad Pass Intch	52,000	
		3150	N/A		
Clark	B	0909	I-515/US 93/US 95, Between the College Intch "Exit 58" & the Wagon Wheel Intch "Exit 57"	62,000	130,083
		0912	I-515/US 93/US 95, Between the College Intch "Exit 57" & the Horizon Intch "Exit 59"	70,000	
		0896	I-515/US 93/US 95, Between the Lake Mead Intch "Exit 61" & the Horizon Intch "Exit 59"	100,000	
		0831	I-515/US 93/US 95, Between the Sunset Intch "Exit 64A" & the Auto Show Intch "Exit 62"	111,000	
		2230	N/A		
		0819	I-515/US 93/US 95, Between the Tropicana Intch "Exit 68" & the Russell Intch "Exit 65"	133,000	
		0814	I-515/US 93/US 95, Between the Flamingo Intch "Exit 69" & the Tropicana Intch "Exit 68"	162,000	
		0798	I-515/US 93/US 95, Between the Boulder Hwy & the Flamingo Intch "Exit 69"	143,000	
		0799	I-515/US 93/US 95, Between the Boulder Hwy & the Charleston Intch "Exit 72"	139,000	
		0789	I-515/US 93/US 95, 0.5 mi S of the Eastern Intch "Exit 73"	153,000	
		0784	I-515/US 93/US 95, Between the Las Vegas Intch "Exit 75B" & the Eastern Intch "Exit 73"	143,000	
		0113	I-515/US 93/US 95, Between the Las Vegas Intch "Exit 75A" & Casino Center Intch "Exit 75B"	172,000	
		0096	I-515/US 93/US 95, Between Downtown Ex Intch & Casino Center Intch	173,000	
Clark	D	0202	US 93, 0.6 mi N of US 93/I-15 Intch "Exit 64"	3,300	1,809
Lincoln		0001	US 93, at mp LN-25 S of Alamo	2,000	
		0004	US 93, 0.6 mi S of SR 318 (near Crystal Springs)	2,300	
		0005	US 93, 0.4 mi N of SR 318	560	
		0015	US 93, 0.5 mi S of SR 317	600	
		0019	US 93, 725 Ft N of Antelope Canyon Rd 0.1 mi N of MP 95	1,400	
		2110	N/A		
		0026	US 93, 130 ft S of County Rd to Cathedral Gorge	1,100	
		0029	US 93, 0.3 mi S of SR 321	860	
		0031	US 93, 1 mi N of SR 321	750	
		0039	US 93, 0.5 mi N of SR 322 (Main St) in Pioche	430	
		0042	US 93, 330 ft S of SR 320 to Caselton N of Pioche	450	
		0046	US 93, 25 ft N of the County Rd to the Bristol Silver mine	400	
White Pine		0074	US 93, 0.4 mi S of US 6/US 50 at Majors	390	
		0073	US 50, Aultman St, 620 ft W of US 6/US 50 with US 93 at Major Woods	900	
		2140	N/A		
		0072	US 6, 0.2 mi S of US 6 jct	3,500	
		0026	US 50, Aultman St, 0.4 mi N of US 6	10,000	
	E	0023	US 93, 200 ft N of US 50 (Aultman St)	11,000	4,556
		0075	US 93, 0.1 mi N of US 93 MP 55 E	5,600	
		0047	US 93, 150 ft S of Ave A	4,100	
		2110	N/A		
		0055	US 93, 0.5 mi S of US 93A (Lages Jct)	1,900	
		0056	US 93, 0.3 mi N of US 93 A (Lages Jct	1,700	
Elko		0155	US 93, 780 ft N of SR 229	1,400	
		0131	US 93, 0.25 mi S of the E Wells Intch "Exit 352"	1,800	
		2110	N/A		
	F	0162	US 93, 125 ft S of NV/ID stateline	4,000	4,000