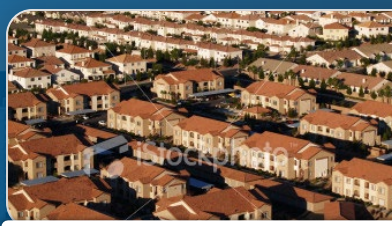
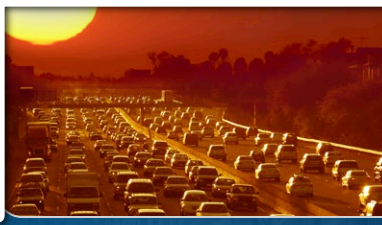
I-11 and Intermountain West Corridor Study

Northern Nevada Future Connectivity Corridor Feasibility Assessment Report







Prepared for

NEVADA DOT and ADOT

July 2014

I-11 AND INTERMOUNTAIN WEST CORRIDOR STUDY

Northern Nevada Future Connectivity Corridor Feasibility Assessment Report

Prepared for

Nevada Department of Transportation

and

Arizona Department of Transportation

July 2014

Prepared by

CH2MHILL® and AECOM

DISCLAIMER

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The Sponsoring Agencies' acceptance of this report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project-level environmental impact assessments and/or studies of alternatives will be necessary.

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Appendices

1. Introduction and Overview

The I-11 and Intermountain West Corridor

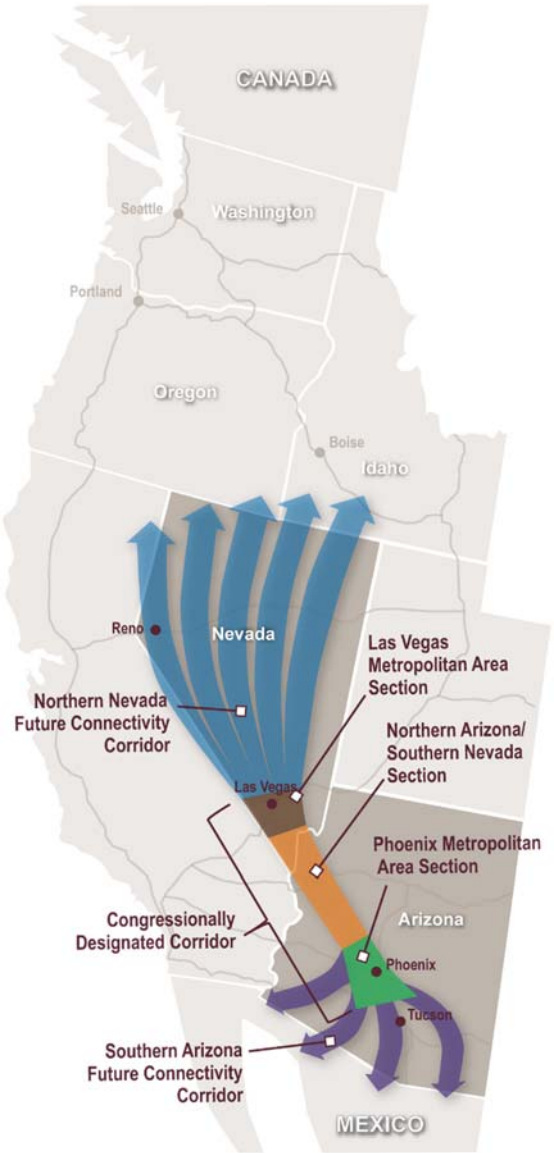
The Arizona Department of Transportation (ADOT) and Nevada Department of Transportation (NDOT), in consultation with the Federal Highway Administration (FHWA) and the Federal Railroad Administration (FRA), and in partnership with the Maricopa Association of Governments (MAG) and the Regional Transportation Commission of Southern Nevada (RTC), referred to as Core Agency Partners, are conducting the Interstate 11 (I-11) and Intermountain West Corridor Study.

The study is the latest action in a decades-long effort by Arizona, Nevada, and other Intermountain West states and the federal government to develop a transportation corridor between the Rocky Mountains and the Cascade Range/Sierra Nevada Mountains linking Mexico and Canada. The two-year study includes detailed corridor planning of a possible high-capacity transportation link connecting Phoenix and Las Vegas, and high-level visioning for extending the corridor north of Las Vegas to Canada and south of Phoenix to Mexico. The Corridor is proposed to include an upgraded highway facility, but it could be paired with rail and other major infrastructure components—such as energy and telecommunications—to serve the nation's needs from Mexico to Canada.

For the purposes of this study, the Intermountain West is the geographic region of the western United States (U.S.) located between the Rocky Mountains on the east and the Cascade Range and Sierra Nevada on the west (**Figure 1-1**). This region is facing a rapidly growing population, expanding global trade, and an aging transportation infrastructure that is reaching capacity.

In addition to the designation of the CANAMEX High Priority Corridor in 1995, recently enacted federal transportation legislation called Moving Ahead for Progress in the 21st Century (MAP-21) designates I-11 as a future Interstate between Phoenix and Las Vegas. In approving the I-11 designation, Congress recognized the need for, and importance of, an Interstate link between these two metropolitan areas.

Figure 1-1. Study Area Segments



The Study Area

The study area includes the entire states of Arizona and Nevada, although more detailed planning will occur in concentrated study segments. The principal project goal is to identify and establish feasible corridor(s) and transportation connections for the portion of the study corridor between Phoenix and Las Vegas, with options for extensions to the north and south. The central segment, extending between the greater Phoenix and Las Vegas Metropolitan Areas, is known as the Congressionally Designated Corridor because of Congress' designation of this segment as future I-11. Because of its length and varying characteristics, this Corridor segment is divided into three sections. Two additional segments beyond the Phoenix and Las Vegas Metropolitan Areas allow higher-level visioning for potential extensions (Figure 1-1).

The I-11 and Intermountain West Corridor divisions are as follows:

- Southern Arizona Future Connectivity Corridor: Mexico to Casa Grande
- Congressionally Designated Corridor: Phoenix Metropolitan Area Section (Casa Grande to Wickenburg)
- Congressionally Designated Corridor: Northern Arizona/Southern Nevada Section (Wickenburg to the Las Vegas Metropolitan Area)
- Congressionally Designated Corridor: Las Vegas Metropolitan Area Section
- Northern Nevada Future Connectivity Corridor: Beyond the Las Vegas Metropolitan Area

The study includes two levels of analysis over a 24-month schedule:

- Detailed planning for the Congressionally Designated Corridor segment between (and including) Phoenix and Las Vegas
- A high-level visioning approach to possible future connectivity corridors from Las Vegas to Canada and from Phoenix to Mexico

This document describes the Northern Nevada Future Connectivity Corridor analysis and findings.

Northern Nevada Future Connectivity Corridor

The Northern Nevada Future Connectivity Corridor stretches from the northern edge of the Las Vegas Metropolitan Area, potentially all the way to the U.S./Canadian border (**Figure 1-2**). However, for this study, the segment is considered to terminate at the northern Nevada and California borders with Oregon and Idaho. Although the maps include the Las Vegas Metropolitan Area, the focus of this study portion spans from beyond the metropolitan area north to the northern edge of the state.

The breadth of the future connectivity study segment allows higher-level visioning for this potential extension beyond the Las Vegas Metropolitan Area.

Figure 1-2. Study Area for the Northern Nevada Future Connectivity Corridor

Report Purpose

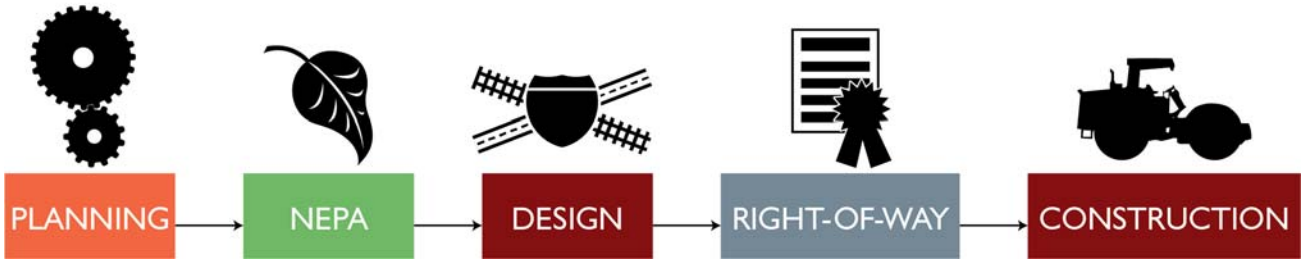
This report is a summary culmination of the entire study process and findings relative to the Northern Nevada Future Connectivity Corridor. While intended as independent documentation of the corridor planning process, this report is supported by various other reports and technical memorandums including:

- Existing Natural and Built Environment Technical Memorandum
- Corridor Justification Report
- Level 1 Evaluation Results Summary Technical Memorandum

All reports are available on the project website, at: http://i11study.com

This information serves as the foundation for the first step in the project development process (**Figure 1-3**), which will be followed by initiation of the National Environmental Policy Act (NEPA) process, eventually leading to design, right-of-way acquisition, and construction.

Figure 1-3. Project Development Process



Report Organization

The following sections of the Northern Nevada Future Connectivity Corridor Feasibility Assessment include:

- Chapter 2: Corridor Context
- Chapter 3: Existing and Future Conditions Overview
- Chapter 4: Evaluation Framework and Alternatives Development
- Chapter 5: Alternatives Evaluation Summary and Results
- Chapter 6: Findings and Recommendations
- Chapter 7: Stakeholder Involvement Summary

2. Corridor Context

Corridor-Wide Goals and Objectives

The Goals and Objectives Statement (full documentation found in Appendix A) provides a big-picture explanation of the potential benefits of the I-11 and Intermountain West Corridor, particularly the segments in Arizona and Nevada. As each segment of the I-11 and Intermountain West Corridor moves from the planning stage to the NEPA phase, individual Purpose and Need Statements will be developed that focus on the unique transportation deficiencies in that segment that must be addressed.

Defining the Goals and Objectives is a first step in the development of this project's Purpose and Need Statement. It begins the process of gathering information to evaluate the need for the I-11 and Intermountain West Corridor that will be shared with agencies and other stakeholders participating in the study.

This chapter provides a summary of the Corridor's Goals and Objectives, as well as other contextual factors that speak to the need for the I-11 and Intermountain West Corridor, as well as transportation problems the corridor has the potential to address.

Key factors that support the I-11 and Intermountain West Corridor's Goals and Objectives include the following:

- **Legislation** – Is there a federal, state, or local governmental mandate for the action?
- **System Linkage** – Is the proposed project a "connecting link?" How does it fit in the transportation system?
- **Trade Corridor** – Will the proposed facility enhance the efficient movement of freight in the study corridor?
- **Modal Interrelationships** – Will the proposed facility interface with and serve to complement airports, rail and port facilities, mass transit services, etc.?
- **Capacity** – Is the capacity of the present facility inadequate for the present traffic? Projected traffic? What capacity is needed? What is the level(s) of service for existing and proposed facilities?
- **Economics** – Projected economic development/land use changes indicating the need to improve or add to the highway capacity
- **Project Status**—Project history, including actions taken to date, other agencies and governmental units involved, action spending, schedules, etc.

The goal of the proposed action is to establish a high-capacity, limited-access, transportation corridor connecting Mexican ports and manufacturing areas with Arizona's and Nevada's largest regional, national and international manufacturing and economic activity centers to support regional, national and international trade. For Arizona and Nevada, the objective of the proposed action is to assist in diversifying the states' economies to target industry clusters that rely heavily on interconnected and efficient transportation systems to transport goods and facilitate business attraction/retention. The need for the proposed action is based on a combination of factors that include legislation, system linkage, domestic and international trade, modal interrelationships, capacity/congestion, economics, and project status/public policy. Together, the goals

and objectives shape the range of corridor alternatives developed and evaluated for the project.

Regional Opportunities

Current global and regional trends are creating demands for new transportation links. It is now often more cost-effective to manufacture and import goods from Mexico than it is from Asia Pacific, increasing the need for high-capacity, north-south transportation infrastructure. The transportation network in the Intermountain West was developed decades ago to serve the economic, population, and mobility needs at that time—east-west movement of people and goods between Southern California and the rest of the country. The need is now shifting to north-south demand.

Investment in regional transportation infrastructure has not kept pace with population growth and changing economic trends. The population of the Intermountain West states (Arizona, Idaho, Montana, Nevada, Oregon, Utah, and Washington) is currently 25 million. Between 2000 and 2010, the rate of growth for the Intermountain West states was 19.6 percent—double that of the U.S. as a whole, which grew at a rate of 9.8 percent. Population and economic growth in Arizona and Nevada are expected to continue to outpace the U.S. average.

Without strategic improvements in transportation infrastructure, the region will lose the opportunity to capitalize on enhanced economic growth related to important trends in regional and national trade. For instance, manufacturing growth in Arizona and Nevada exceeded the U.S. average, indicating a strengthening economic sector that is strongly linked with transportation demand. State economic development departments are focused on diversifying the Arizona and Nevada economies to target industry clusters that rely heavily on interconnected and efficient transportation systems to both transport goods and facilitate business attraction/retention.

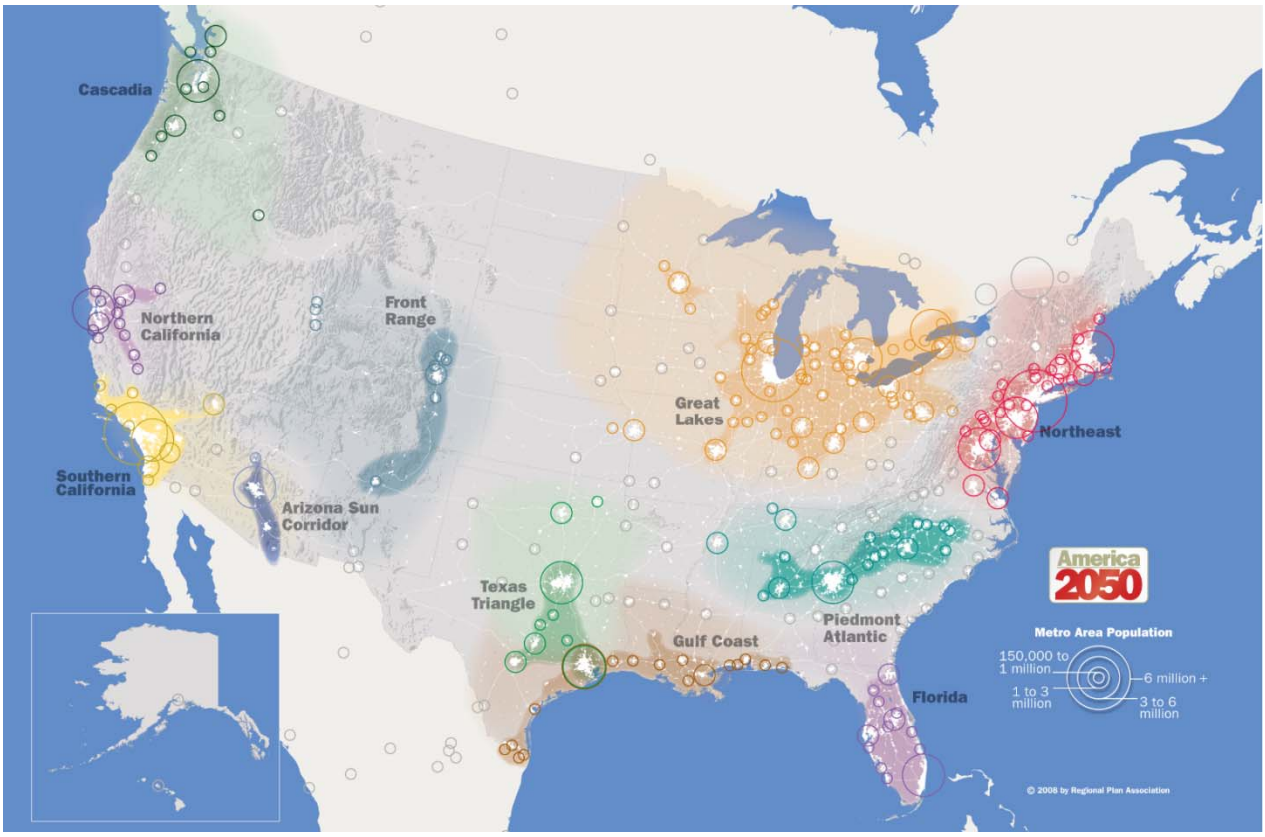
Economic Opportunities Created by Connected Megaregions

The Brookings Institution, Regional Plan Association, and others have developed and furthered the concept of “megapolitans” as the key U.S. areas of integration with world trade (Regional Plan Association 2005) (**Figure 2-1**).

A megapolitan, of which 11 have been designated in the U.S., can be defined as a conglomeration of two or more intertwined metropolitan areas with a combined population of 5 million or more. A megapolitan is characterized by interlocking economic systems, shared natural resources and ecosystems, and common transportation systems. The U.S. megapolitan areas contain most of the nation’s major ports and international airports, and their assets give them a large presence in world trade (Nelson and Lang 2011).

Efficient mobility is a major competitive advantage in the global playing field, where time savings create value. Our competitors in Asia and Europe are creating Global Integration Zones by linking specialized economic functions across vast geographic areas and national boundaries with high-speed rail and dedicated goods movement systems. The increased mobility of workers, business travelers, and goods between the cities of these megapolitans enables greater collaboration, flexibility, and innovation.

Figure 2-1. Megapolitan Areas in the Continental United States and Southern Canada



Source: Regional Plan Association 2005

Improving and maintaining megapolitan infrastructure is an important national priority, especially for the Southwest, which seeks more trade and exports as a way to diversify its economy from consumption and real estate toward technology, innovation, and high-value manufacturing. The megapolitan capacity for trade is a key element in this economic transition. Failure to establish adequate infrastructure to move people and goods around the country and the region would significantly constrain future economic growth.

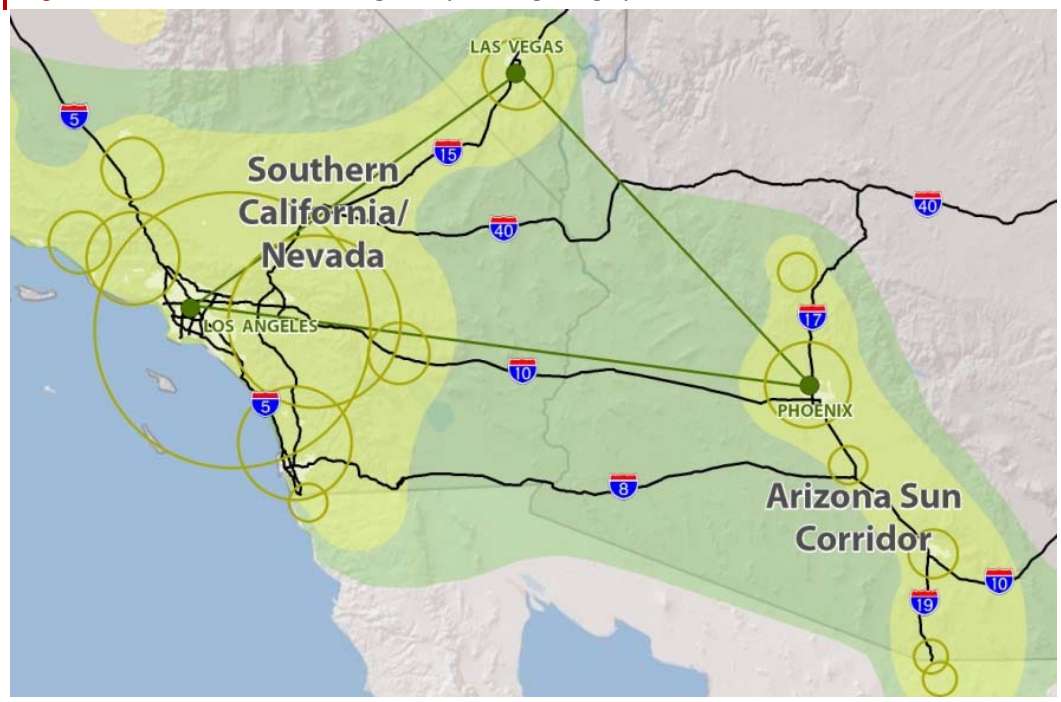
Southwest Triangle Megaregion

The emerging Southwest Triangle, with a population approaching 30 million (**Figure 2-2**), consists of three main centers of growth, however its influence area can be much greater, encompassing travel throughout Arizona and Nevada:

- Southern California, with more than 20 million residents from San Diego to Santa Barbara
- Arizona's Sun Corridor, which is comprised of the metropolitan areas of Phoenix, Tucson, Prescott, and Nogales, with nearly 6 million people
- The Greater Mojave Region centered on Las Vegas with about 2.2 million people (part of Southern California megapolitan)

The Southwest Triangle is on a trajectory to be one of the most economically strong American regions that maintains linkages to the world's fastest emerging economies in both Asia and Latin America. For the last half century, Southern California has built America's most significant connections to Asia, displacing San Francisco as the nation's leading region for this trade. Southern California is now hyperlinked to Asia, and Las Vegas and the Sun Corridor are actively engaged in establishing new trade with Latin America.

Figure 2-2. The Southwest Triangle: Expanding Megapolitans



The key issue now is to determine what infrastructure improvements would facilitate greater economic integration of this megaregion. This area already has one of the most densely linked air systems of any region in the country, with 2 of the 10 ten busiest air corridors: Los Angeles-Las Vegas and Los Angeles-Phoenix (Brookings Institution 2009a).

This region also has the weakest ground-based transportation connectivity of any U.S. megaregion. The Southwest Triangle, especially Phoenix and Las Vegas, has an underdeveloped Interstate network that does not meet current demand; which is expected to double between these cities by 2040.

This is the only megaregion where there is a gap in the Interstate system between megapolitan anchors (Phoenix and Las Vegas). In addition, the lane miles between the key megapolitans is also limited compared to peer megaregions. Consider that the Piedmont region in the East extends from Raleigh, North Carolina, to Atlanta, Georgia, with large stretches of I-85 that exceed four lanes lining these metropolitan areas. By contrast, most of I-10 linking the Sun Corridor to Southern California and I-15 linking Las Vegas to Southern California are mostly standard four-lane Interstate roadways. With no direct rail service between the two metropolitan areas, and only minimal intercity bus service, the region has not kept pace with evolving needs.

Despite this, the Southwest Triangle has significant international connections. The international trade through Los Angeles and Long Beach is the largest in the country, and the majority of goods are handled on the congested California freeways, including I-5 for goods traveling north-south. Most of these goods are moving north or east for distribution throughout the U.S.—traveling throughout the Southwest Triangle and on to other points. Shifting trade trends from Asia to Latin America increase the demand for north-south travel corridors.

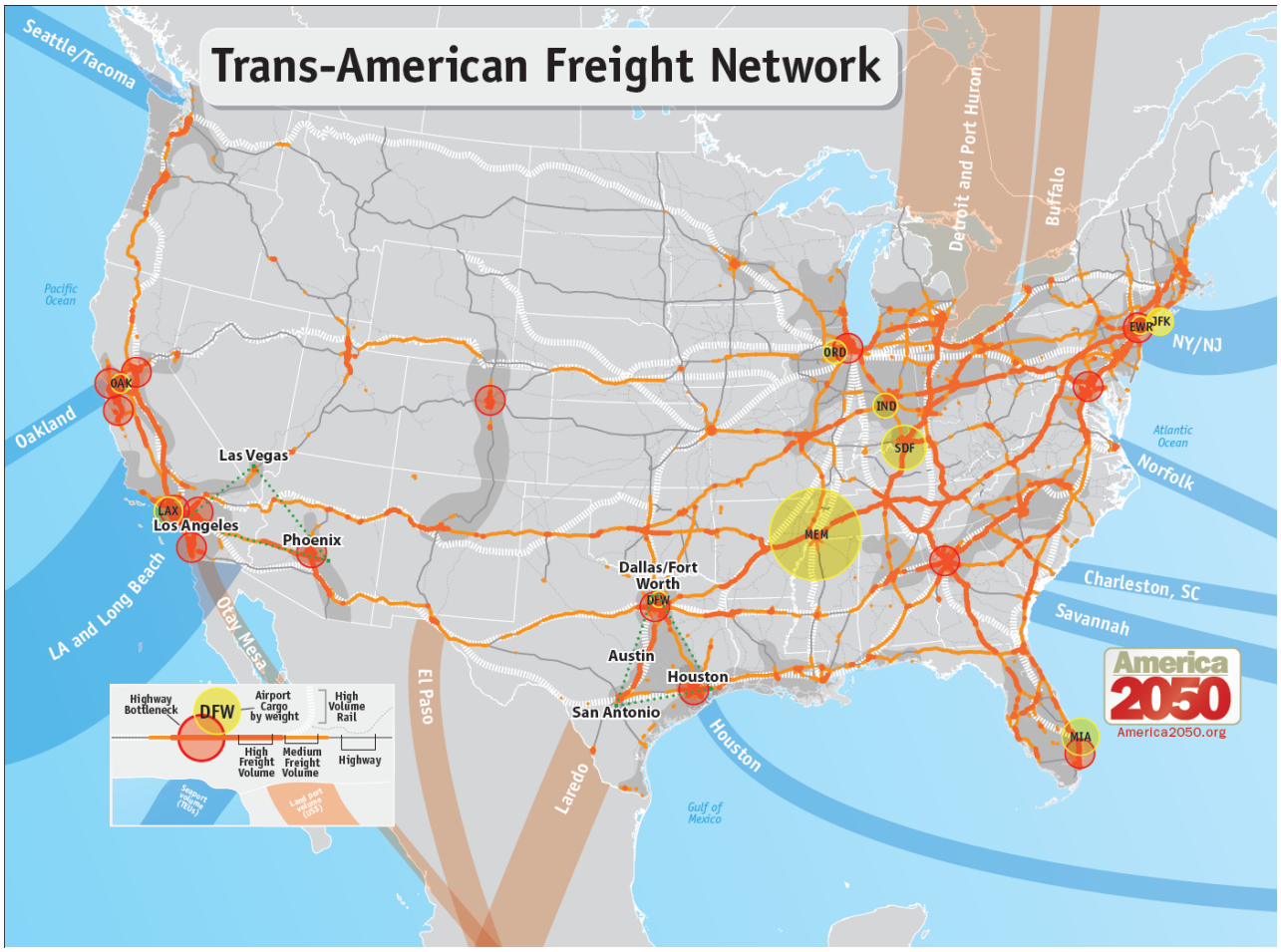
The I-11 and Intermountain West Corridor and Arizona and Nevada

The states of Arizona and Nevada, with the addition of the I-11 and Intermountain West Corridor, are well positioned to take advantage of megaregion economic activity, specifically to fill the gap of the north-south trade demand. The Corridor has the ability to connect the megaregions in the western U.S. (Sun

Corridor/evolving Southwest Triangle and Casacadia) – both of whose economic influence area transcend national boundaries (Mexico and Canada) – forming a corridor to take advantage of the shifting trade trends.

The lack of connections and transportation infrastructure in this study area however, makes freight flows from and to Mexico more attractive through Texas or California border crossings than Arizona. **Figure 2-3** highlights the lack of both rail and Interstate highway connections between the major cities within Arizona and Nevada.

Figure 2-3. North American Freight Network



Source: America2050.org

Providing an alternate north-south connection in the western U.S. is crucial to ensure timely, efficient, and competitive trade. The I-11 and Intermountain West Corridor provides an opportunity to fill this transportation gap in terms of efficient high-speed, domestic north-south travel. It also provides potential expeditious linkages between existing and future foreign ports and critical east-west, high-speed transportation corridors in the U.S., the junctions of which can provide significant regional economic development opportunities. The I-11 and Intermountain West Corridor has the potential to become one of the first north-south, high-capacity routes through the Intermountain West that could greatly improve commerce, tourism, and international trade opportunities across the West.

3. Existing and Future Conditions Overview

Planning and Environmental Linkages Approach

FHWA has recently issued new guidance to assist transportation planners and environmental practitioners in the use of corridor and subarea planning to inform the NEPA process. While this study phase will not include detailed environmental documentation such as an environmental impact statement, the results of this "pre-NEPA" effort will follow the Planning and Environmental Linkages (PEL) process, which is an integrated approach to transportation decision-making that takes into account environmental, community, and economic goals throughout the project life cycle, from the planning stage (current study) through environmental (NEPA), design, and construction/maintenance. PEL promotes greater communication within and among transportation and resource agencies, leading to improved decision-making and project development.

ADOT and NDOT have both worked with the FHWA to adapt the federal guidance into state-led processes, which include checklists to be completed throughout a study's process. The PEL processes of the two states are similar and will be carried forth throughout this study to identify important issues early so that agencies, stakeholders, and the public can make informed and timely decisions.

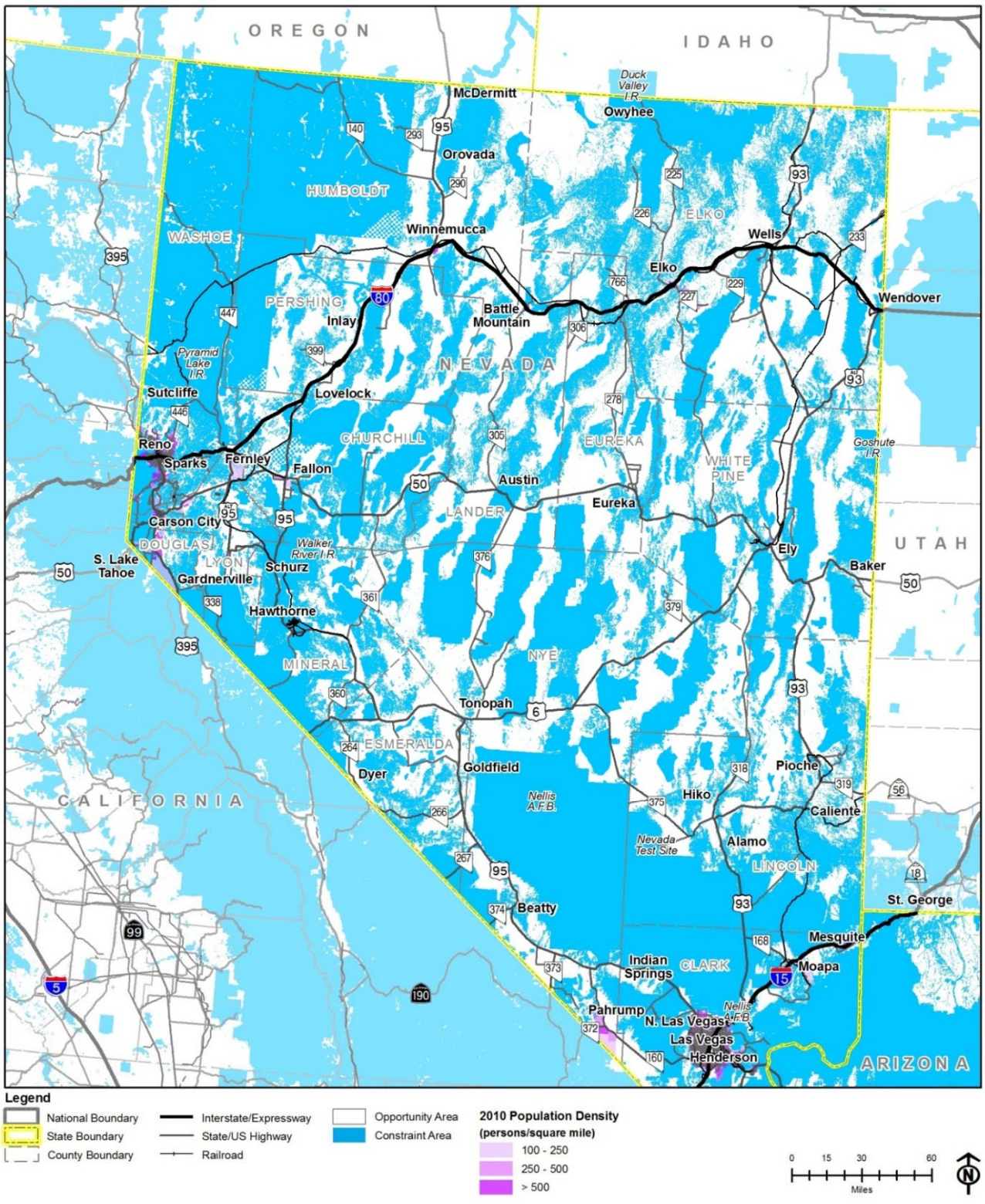
The PEL documentation includes a description of the environmental setting and an understanding of the existing infrastructure to make corridor use as efficient as possible through innovative solutions. The use of the PEL process will help streamline the entire environmental review process, allowing this study to provide the foundation and minimize the need for re-evaluation as the project progresses into the environmental phase.

This review of the existing environment is intended to be preliminary. Its intent is to identify fatal flaws and issues that will need to be considered as the project moves into the alternatives analysis phase. While this review supports both the ADOT and NDOT PEL processes, the full analysis of environmental impacts of project implementation, pursuant to NEPA, has yet to begin. The intent of this PEL-supported work will assist in the scoping of that NEPA analysis.

Opportunities and Constraints Analysis

Using the data and information acquired to conduct an analysis of the natural and built environment, maps were developed to illustrate constraint and opportunity areas for Corridor development. **Figure 3-1** shows these areas for the Northern Nevada Future Connectivity Corridor. The blue areas on this map show constraint areas, or portions of the environment that are generally not conducive to placement of or implementation of a high capacity transportation corridor. While this analysis presents these constraints on a macro scale, all areas shaded in blue on the map do not necessarily reflect fatal flaws. Some contributing factors may be accommodated or mitigated as Corridor refinement evolves. Maps of contributing opportunities and constraints data are available in the *Existing Natural and Built Environment Technical Memorandum*.

Figure 3-1. Opportunity and Constraint Areas: Northern Nevada Future Connectivity Corridor



At a high level, the blue constraint areas reflect the following features:

- Areas of Critical Environmental Concern (ACECs)
- Wilderness areas
- National monuments
- National Conservation Areas (NCAs)
- Critical habitats
- Slopes in excess of 12 percent
- Rivers/scenic rivers
- Federal Emergency Management Agency 100-year flood zone
- Surface water
- Riparian areas
- Wetlands
- Tribal lands
- Military installations
- Local/state parks, National Park Service, U.S. Forest Service, U.S. Fish and Wildlife Service/national wildlife refuges

The white areas on the map reflect opportunity areas for corridor development. Ranges of population densities are also shown. These areas represent developed communities with a population density threshold of more than 100 persons per square mile and all fall within the white opportunity areas. These areas are shown for reference purposes to understand where population clusters reside and, therefore, to understand the nodes or activity centers that people may be traveling between.

Additional opportunities exist to consider in corridor planning; however, these are not necessarily geographic in nature and are therefore translational to the above mentioned maps. These considerations include:

- Potential shared corridors for broadband infrastructure deployment
- Coordination with the Bureau of Land Management (BLM) and other federal land management agencies' planning processes to better serve recreational areas and/or align with their travel and/or resource management plans
- High potential for commercial-scale renewable energy generation throughout the study area (especially solar), which requires transport options for energy transmission, as well as facilitates industrial growth
- Potential for shared or adjacent rights-of-way for other utility transmission

Leading Opportunities and Constraints

Topography and land ownership patterns will form the major corridor consideration constraints in the Northern Nevada Future Connectivity Corridor, which comprises the majority of the state (Figure 3-1). Nevada contains many isolated mountain ranges separated by flatter basins. These ranges generally trend north-south and most are short and narrow with steep slopes (greater than 12 percent). The western side of the state includes portions of the Sierra Nevada Mountains, as well as many lakes and reservoirs. From a land management standpoint, the overwhelming majority of the state is comprised of BLM land, U.S. Forest Service lands, and military land holdings. The Humboldt-Toiyabe National Forest comprises 6.3 million acres in Nevada (the largest national forest in the lower 48 states), split into more than 10 clusters of forest lands throughout the state. Military land holdings are large, specifically Nellis Air Force Base, the Nevada National

Security Site (Nevada Test Site), Creech Air Force Base, Fallon Naval Air Station, and Hawthorn Army Ammunition Plant. The area also has several state wildlife areas, wilderness areas, and tribal communities. Most ACECs and critical habitat areas are located in the southeastern and northwestern parts of Nevada. Population clusters are dispersed, with Reno-Sparks/Carson City being the primary population/employment center in northern Nevada.

From an opportunity standpoint, the majority of the Northern Nevada Future Connectivity Corridor area is primarily managed by government entities with minimal development. The area falls within a medium to very high solar potential range and has potential for other renewable energy resources, including wind and geothermal energy production.

Existing and Future Transport Characteristics

Nevada is served by two Interstate highways with primary travel being east-west movements, including I-80 which traverses the northern portion of the state, and I-15, which although serving north-south travel, crosses southern Nevada in an east-west direction. Two Union Pacific Railroad (UPRR) mainlines traverse Nevada – one linking central California with Salt Lake City via Reno, and the other connecting Los Angeles with Salt Lake City via Las Vegas. No north-south rail service exists connecting the Las Vegas metropolitan areas to Northern Nevada.

New passenger rail routes are currently under study to improve passenger rail connectivity in the Southwestern U.S. Similar to highways, interstate passenger rail (Amtrak) is limited to east-west travel. Intercity and Interstate public transportation is currently served exclusively by buses.

Congestion

Congestion has impacts on both people and goods, affecting businesses, suppliers, manufacturers, and the overall economy. If congestion affects truck productivity and delivery times, costs are passed on to consumers in the form of higher prices, affecting areas far from the region where the congestion occurs. Congestion can result in unreliable trip times and missed deliveries, which have major business implications. Severe congestion also has the potential to impact shipping patterns whereby freight flows are diverted to less congested routes.

Two locations in Nevada appear in FHWA's annual report on congestion at freight-significant highway locations. The majority of locations currently monitored are urban Interstate interchanges, and they are ranked according to the impact of congestion on freight (American Transportation Research Institute 2011):

- I-15 at I-515 in Las Vegas
- I-80 at US-395 in Reno

Figure 3-2 shows the existing congestion on the major highways in Northern Nevada. As illustrated, very little congestion exists today, with the exception of some congested segments of US-395 through Reno.

Future year 2040 forecasts (**Figure 3-3**) show that in the Northern Nevada Future Connectivity Corridor, new capacity may be needed to accommodate growth along I-580/US-395 through Reno. Additionally, some moderate congestion is expected along I-580 through Carson City and south of Reno. All other major highway corridors are expected to experience little to no congestion in 2040 based on current travel demand models. As traffic congestion continues to increase on California highways, long-distance passenger vehicle and commercial truck trips greater than 50 miles may shift to parallel routes east of the Sierra Nevada such as US-395, US 95, I-15, or an I-11 and Intermountain West Corridor. Nearly all of the major freeways in Southern California are projected to be congested in 2040.

Ports

The U.S. is the top importer of containerized cargo in the world, much of which enters the country on the West Coast and is shipped to destinations across the country. Because the Port of Los Angeles/Port of Long Beach (POLA/POLB) in Southern California are the number one and two gateways of manufactured goods from the Asian markets, and are typically the most cost-effective way to deliver goods to North American markets, their function and capacity have a significant impact on the direction and volume of freight flows in the study area. Increasing congestion on California's road and rail systems could have the effect of shifting greater amounts of trade.

The ports of Seattle, Tacoma, and Oakland could potentially use an I-11 and Intermountain West Corridor. These ports handled only 61 percent of their total capacity in 2010. The Canadian ports of Vancouver and Prince Rupert are also viable alternatives to the congested POLA/POLB complex. They are the 5th and 26th largest ports in North America, for containerized cargo. The port of Vancouver is essentially located at the north end of the I-5 Corridor and has committed to improvements to meet the growing demand for capacity expected over the next 25 years. Prince Rupert has a geographically advantageous location; due to its high latitude, it is three days closer to China than POLA/POLB. It is located in an area with little congestion, and goods that land in Prince Rupert can be transported to Chicago via road or rail within four days.

The I-11 and Intermountain West Corridor has the opportunity to facilitate goods movement across the country by providing efficient north-south connections between major east-west highway and rail corridors.

Figure 3-2. Existing Congestion on Major Highways in Northern Nevada Future Connectivity Area

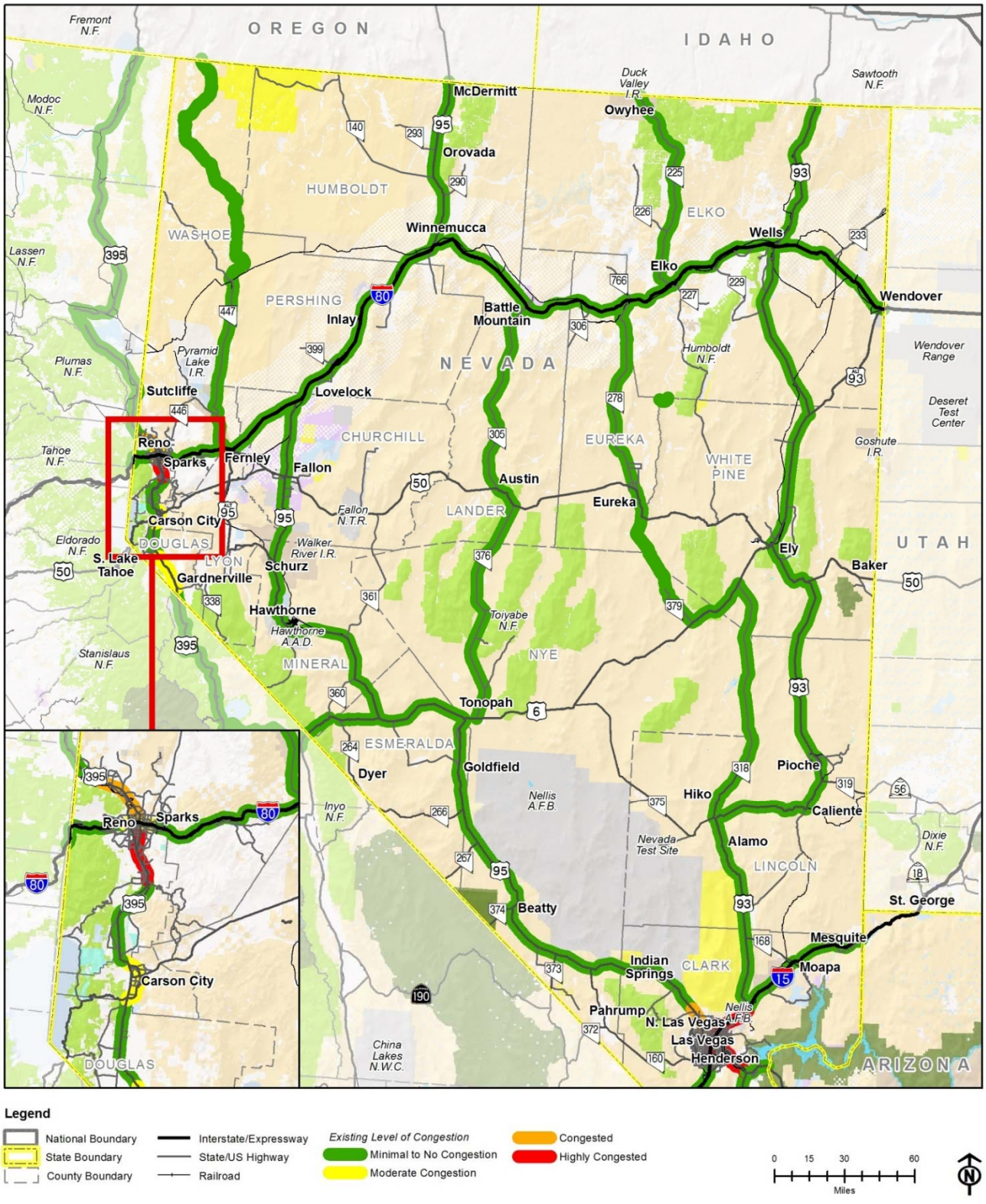
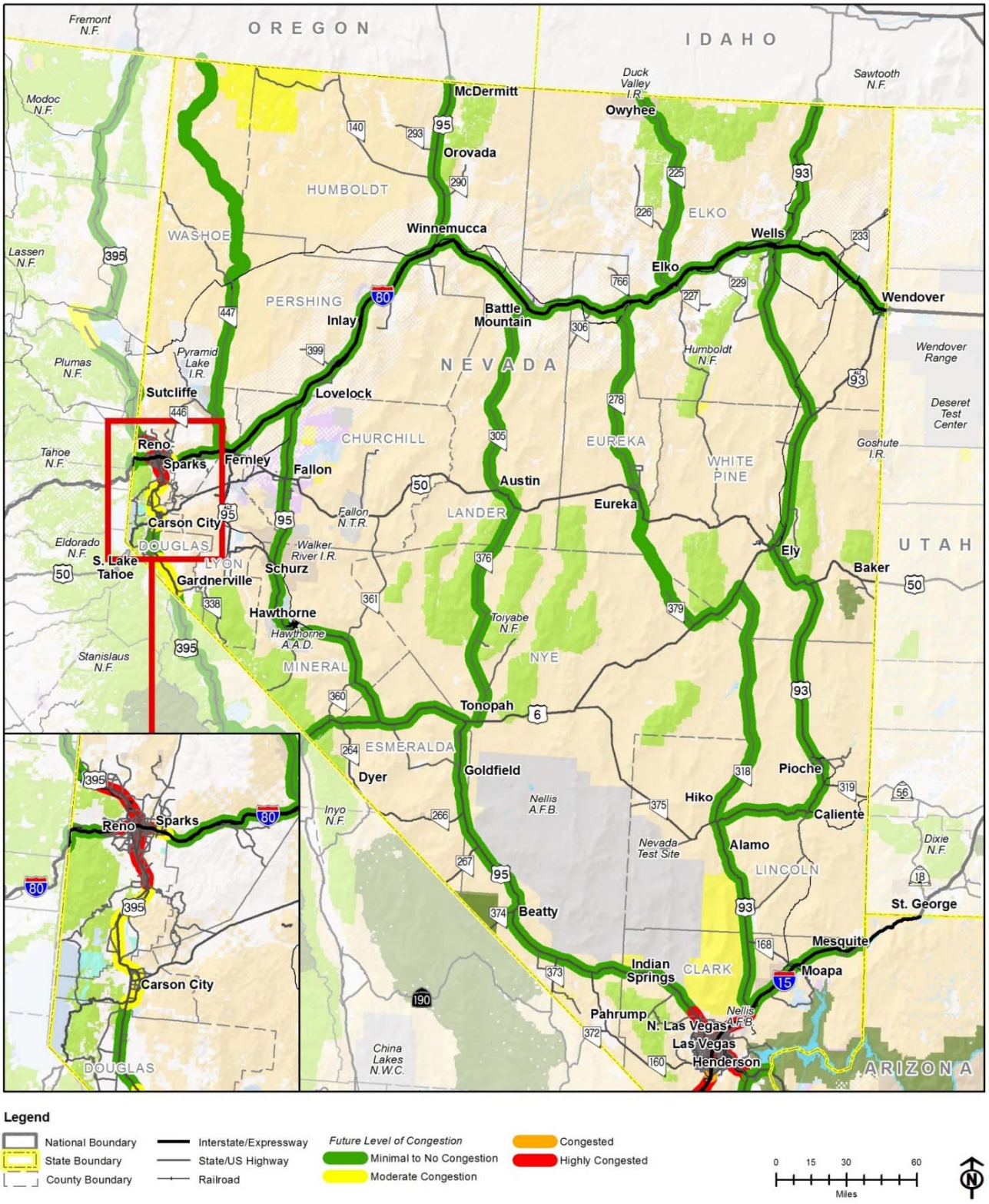


Figure 3-3. Future Congestion on Major Highways in Northern Nevada Future Connectivity Area

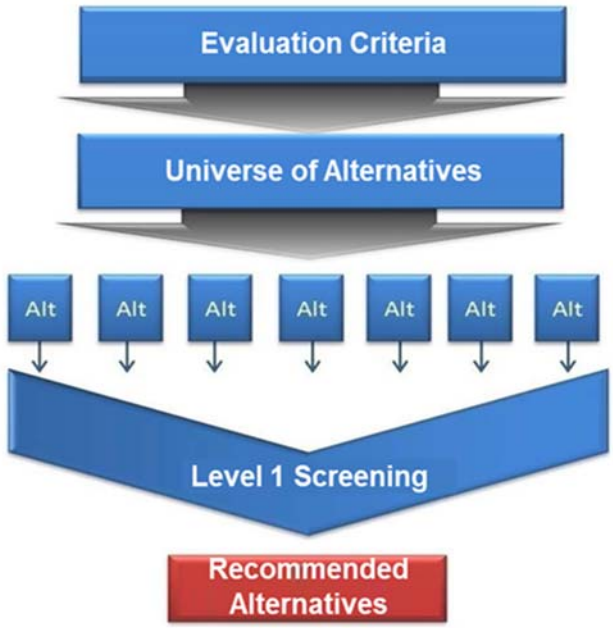


4. Evaluation Framework and Alternatives Development

Evaluation Framework

For purposes of this study, an alternative is defined as a corridor containing one or more modes (e.g., highway or rail) within one or more of the corridor segments. Part or all of a corridor may consist of, or contain, an existing transportation facility as well as other infrastructure, such as utilities. The evaluation process for the future connectivity corridors consisted of one level of qualitative screening (see **Figure 4-1**). Recommended alternatives suggest preferred corridor connections only, with specific alignment planning to be pursued in future planning efforts.

Figure 4-1. Evaluation Process for Future Connectivity Corridors



Process

The Level 1 screening applied a small number of qualitative criteria to a comprehensive universe of alternatives. The purpose of this evaluation was to assess whether an alternative met the Goals and Objectives of the project to help identify which corridor options (routes and modes) could be the most promising candidates for long-term connections to the Congressionally Designated Corridor.

Evaluation Criteria

The first step of this process was to develop the evaluation criteria. Eleven evaluation categories were formulated in consultation with stakeholders and consisting of one or more evaluation criteria, as shown in **Table 4-1**.

Table 4-1. Evaluation Criteria

Evaluation Category		Criteria
Legislation	1	How well does the alternative meet the intent of legislative actions, including MAP-21 and the 1995 National Highway Systems Designation Act?
System Linkage	2	How well does this alternative connect major national and international activity centers from Mexico to Canada through the Intermountain West?
	3	How well does this alternative most directly close gaps and/or develop missing linkages in the regional and national transportation network?
	4	How well does this alternative connect with adjacent segments/sections?
Trade Corridor	5	How well does this alternative connect major freight hubs and high-capacity transportation corridors?
Modal Interrelationships	6	How well does this alternative maximize opportunities for intermodal connectivity (highway, rail/transit, aviation)?
	7	How well does this alternative accommodate multiple modes in a shared corridor footprint (highway and rail)?
Capacity/Congestion	8	How well does this alternative relieve existing and projected congestion between and within the major activity centers in Nevada and Arizona?
	9	How well does this alternative align with existing conditions or proposed improvements at land ports of entry (as appropriate)?
Economic Vitality	10	How well does this alternative support regional, state and national economic development goals?
Project Status/ Transportation Policy	11	How well does this alternative comply with corridor-related actions taken to date?
	12	How well does this alternative conform to locally adopted transportation plans?
Environmental Sustainability	13	How compatible is this alternative with regional open space, conservation, and land management agency planning?
	14	How well does this alternative minimize environmental impacts (such as drainage, topography, species, and biological connectivity)?
Land Use and Ownership	15	How consistent is this alternative with regional land use and growth strategies?
	16	How compatible is this alternative with major land ownership patterns?
Community Acceptance	17	How well is this alternative accepted by the local communities?
Cost	18	What is the overall relative cost of this alternative, where “least favorable” is the highest relative cost and “most favorable” the lowest?

Note: Each criteria was rated on a five-level qualitative scale of “least favorable” to “most favorable.”

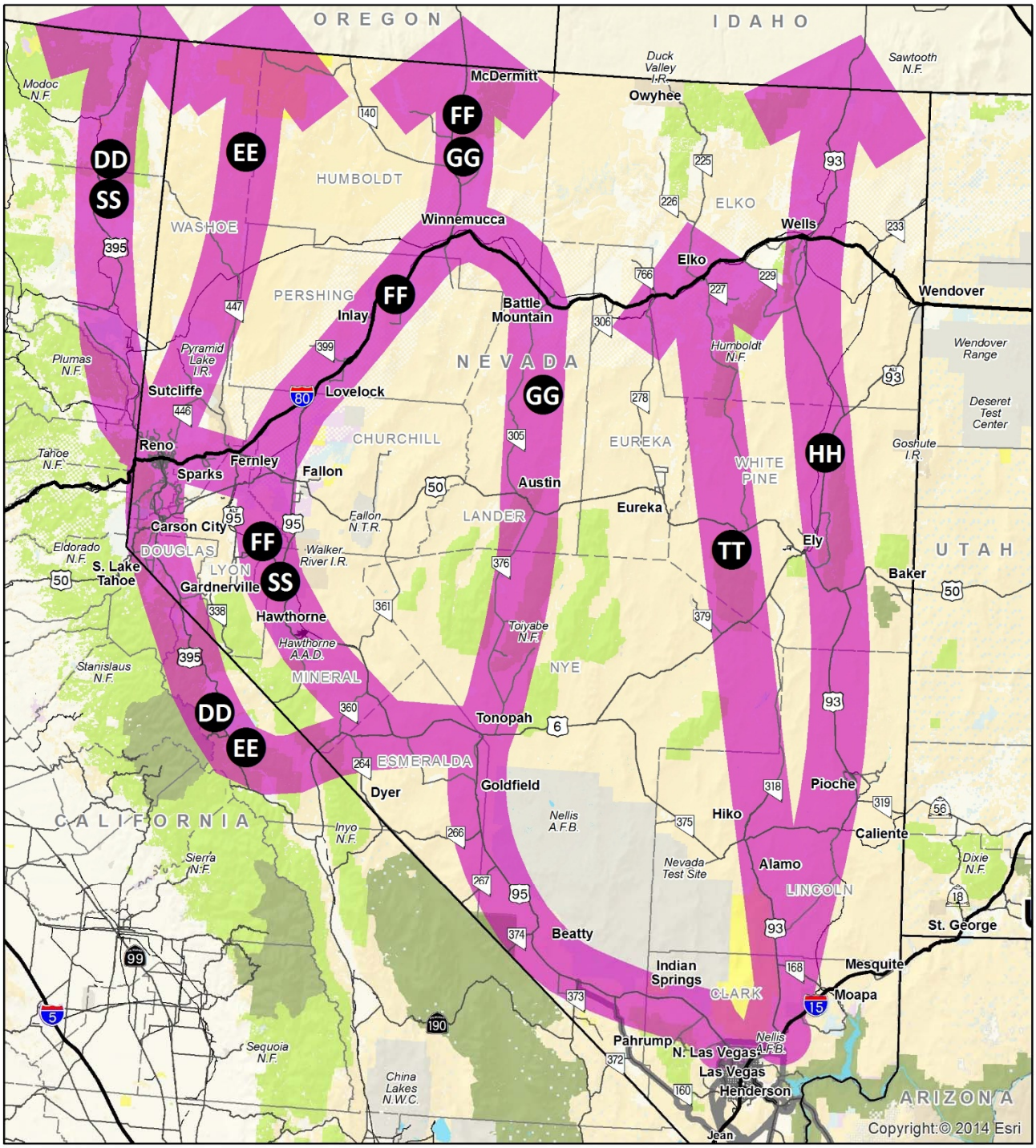
Universe of Alternatives

Seven alternative corridor connections were developed for the Northern Nevada Future Connectivity Corridor. **Table 4-2** describes the alternative corridor connections developed, as illustrated together in **Figure 4-2**. Alternative corridors are shown as wide swaths to represent broad corridor connections. These broad swaths do not necessarily represent one corridor, but rather might encompass a range of alternative alignments that can be explored in future phases of more detailed study. The ultimate goal of selecting a preferred alternative(s) is to choose a connection(s) between the Congressionally Designated Corridor and Canada that best meets the Goals and Objectives of implementing a major trade corridor in the Intermountain West.

Table 4-2. Alternative Corridor Connections for the Northern Nevada Future Connectivity Corridor

Alternative	Description
DD	This alternative travels through western Nevada to make a northerly connection into California and Oregon, diverting west near Reno.
EE	This alternative travels through western Nevada to make a northerly connection into Oregon through Washoe County.
FF	This alternative travels through western Nevada to make a northerly connection into Oregon through Winnemucca, and traversing the Fernley/Fallon area.
GG	This alternative travels through central Nevada to make a northerly connection into Oregon through Winnemucca.
HH	This alternative travels through eastern Nevada to make a northerly connection into Idaho (centered on the existing US-93 corridor).
SS	This alternative travels through western Nevada to make a northerly connection into California and Oregon, diverting west near Fernley toward Reno.
TT	This alternative travels through eastern Nevada to make a connection at Elko with the ability to travel east, west, or north.

Figure 4-2. Alternative Corridor Connections for the Northern Nevada Future Connectivity Corridor



ALL INFORMATION IS PRELIMINARY / SUBJECT TO REVISION

Maps identify desired connections between project geographic segments. Alternatives do not identify specific alignments, nor preclude multiple alignments within each alternative.

5. Alternatives Evaluation Summary and Results

Criteria Applicability

The study team conducted the evaluation of the seven alternatives shown in Figure 4-2, with each alternative rated with respect to the evaluation criteria presented in Table 4-1. General guidance on how the criteria were evaluated for the Northern Nevada Future Connectivity Corridor in relationship to the project's Goals and Objectives follows.

Criterion 1: How well does the alternative meet the intent of legislative actions, including MAP-21 and the 1995 National Highway Systems Designation Act?

- Alternatives were evaluated based on their compliance with Congressionally-designated high priority corridors, including:
  - CANAMEX: I-19 from Nogales to Tucson, I-10 from Tucson to Phoenix, US-93 in the vicinity of Phoenix to the Nevada border, US-93 from the Arizona border to Las Vegas, and I-15 from Las Vegas to the Canadian border.
  - The Washoe County corridor, along Interstate Route 580/United States Route 95/United States Route 95A, from Reno, Nevada, to Las Vegas, Nevada.
  - United States Route 395 Corridor from the United States-Canadian border to Reno, Nevada.
  - United States Route 95 Corridor from the Canadian border at Eastport, Idaho, to the Oregon state border.

Criterion 2: How well does this alternative connect major national and international activity centers from Mexico to Canada through the Intermountain West?

- Alternatives were evaluated based on their connectivity to primary centers of population and commerce at segment termini and along the corridor. This analysis was conducted at a macro scale using the megapolitan areas identified by America 2050 and the Regional Plan Association, shown previously in Figure 2-1 and introduced in the "Corridor Justification Report", as major economic activity centers. In this segment, primary consideration was given to alternatives that connected to both the Southern California (includes Las Vegas) megapolitan and the Northern California (includes Reno/Fernley) megapolitan.

Criterion 3: How well does this alternative most directly close gaps and/or develop missing linkages in the regional and national transportation network?

- This criterion was applied to all segments to understand gaps or links in the regional transportation network that can be filled (or a route made more efficient) with the construction of this corridor. In this segment, there are gaps in the Congressionally-designated Washoe County Corridor, specifically in that I-580 does not connect to US 95 or US 95A; therefore, alternatives that closed these gaps and important gaps in the overall transportation network rated higher than those that did not.

Criterion 4: How well does this alternative connect with adjacent segments/sections?

- Alternatives were evaluated based on the ability to make a connection with an alternative in the adjacent segment/section. Alternatives that connected with two adjacent segments rated "most

favorable"; alternatives that connected with one adjacent segment rated "moderately favorable"; and alternatives that did not connect with any adjacent segments rated "least favorable." A maximum of only one connection is possible in this segment, and therefore the maximum rating is "moderately favorable." All alternatives in this segment connect to the Congressionally Designated Corridor.

Criterion 5: How well does this alternative connect major freight hubs and high capacity transportation corridors?

- Alternatives were evaluated based on how many freight hubs (Reno/Sparks Metropolitan Area, Fernley Industrial Park, Elko Regional Railport, and Tahoe-Reno Industrial Center) and/or high capacity transportation corridors (I-80, UPRR) they traversed.

Criterion 6: How well does this alternative maximize opportunities for intermodal connectivity (highway, rail/transit, aviation)?

- Alternatives were evaluated based on the number of east-west, high-capacity roadway and railroad corridors traversed, and proximate airports and intermodal yard facilities. Intermodal connections include the UPRR Sparks Intermodal Facility, Elko Rail Yard, Elko Regional Railport, Fernley Industrial Park, Tahoe-Reno Industrial Center, Carlin Rail Yard, Reno-Tahoe International Airport, Amtrak (operating in UPRR corridor parallel to I-80), and I-80.

Criterion 7: How well does this alternative accommodate multiple modes in a shared corridor footprint (highway and rail)?

- Alternatives were evaluated qualitatively, based on the percent of the corridor that could accommodate multiple modes and uses (highway, rail, utilities, etc.) in one corridor footprint. Those alternatives along existing rail lines (e.g., Nevada Northern Railway, South Central Route, and Thorne Branch Line) rated higher. Other alternatives with topographic constraints rated lower.

Criterion 8: How well does this alternative relieve existing and projected congestion between and within the major activity centers in Nevada and Arizona?

- Alternatives were evaluated using existing and projected future level of service conditions identified in the "Corridor Justification Report". Where an alternative has the opportunity to relieve congestion between major activity centers, it was rated "most favorable".

Criterion 9: How well does this alternative align with existing conditions or proposed improvements at land ports of entry (as appropriate)?

- Since this criterion was not related to this segment, all of the alternatives were rated equally with a "moderately favorable" rating.

Criterion 10: How well does this alternative support regional, state and national economic development goals?

- Alternative corridors were rated "somewhat favorable", "moderately favorable", or "less favorable" based on their ability to take advantage of industry targets identified in **Table 5-1**. Generally speaking, the larger urbanized areas (e.g., Reno-Sparks, Carson City) are better situated to take advantage of the industry clusters requiring a larger and/or higher-skilled workforce.

Table 5-1. Arizona and Nevada Industry Targets and Clusters

Industry Targets	Arizona	Nevada	Requires Regional Transportation Network
Advanced Manufacturing	•	•	•
Aerospace, Aviation, Defense	•	•	•
Agriculture	•	•	•
Biotechnology	•		•
Healthcare	•	•	
Information and Computer Technology	•	•	
Life Sciences	•		•
Mining and Materials	•	•	•
Optics	•		•
Renewable Energy	•	•	•
Science and Technology	•		•
Tourism, Gaming, and Entertainment	•	•	•
Transportation and Logistics	•	•	•

Sources: Arizona Commerce Authority 2013, Greater Phoenix Economic Council 2013, Tucson Regional Economic Opportunities 2006, Nevada Governor's Office of Economic Development 2013

Criterion 11: How well does this alternative comply with corridor-related actions taken to date?

- Alternatives were evaluated based on the percent of the corridor recognized by a state or regional corridor-related action. Alternatives utilizing USA Parkway, improved US 95 northwest of Las Vegas, and/or the new I-580 were rated higher.

Criterion 12: How well does this alternative conform to locally adopted transportation plans?

- Alternatives were evaluated based on the percent of the corridor recognized by a plan adopted by a local community, such as a General/Comprehensive Plan or Transportation Master Plan.

Criterion 13: How compatible is this alternative with regional open space, conservation, and land management agency planning?

- Alternatives were evaluated based on the amount of the alternative that traverses a protected open space, identified from various sources which include, but are not limited to: national conservation areas, existing parks, wilderness areas, wildlife refuges, and local/regional open space management plans.

Criterion 14: How well does this alternative minimize environmental impacts (such as drainage, topography, species, and biological connectivity)?

- Alternatives were evaluated based on the amount of the corridor traversing various environmental features (as presented in the "Existing Natural and Built Environment" technical memorandum).

Criterion 15: How consistent is this alternative with regional land use and growth strategies?

- Alternatives were evaluated based on the consistency of the corridor with land use or growth strategies identified as part of regional planning efforts (e.g., Regional Transportation Plan [RTP], socioeconomic projections, county comprehensive plans, federal land management plans).

Criterion 16: How compatible is this alternative with major land ownership patterns?

- Alternatives were evaluated based on the compatibility of a major transportation infrastructure facility to traverse land under state or federal ownership, including such land owners as BLM, Bureau of Reclamation, U.S. military, National Park Service, state land departments, state parks, tribal communities, U.S. Fish and Wildlife, and U.S. Forest Service.

Criterion 17: How well is this alternative accepted by the local communities?

- Input received from Stakeholder Partners and their constituents at the October 2013 stakeholder partner/public meetings, as well as input received via the online comment form or other written communication, were considered in determining the degree of acceptance of an alternative. Alternatives that received no comments or conflicting comments (supportive and non-supportive) received a "moderately favorable" rating. Alternatives that received mostly supportive comments received the "most favorable" rating and alternatives that received mostly non-supportive comments received the "least favorable" rating.

Criterion 18: What is the overall relative cost of this alternative, where "least favorable" is the highest relative cost and "most favorable" the lowest?

- Generalized, comparative planning-level costs were estimated based primarily on length of the alternative, with capital construction cost factors given to (a) existing corridors, (b) existing corridors requiring additional right-of-way or significant upgrades/improvements, and (c) new/green corridor development. Compared to the cost per mile of improving an existing highway, it was assumed that a new highway would cost twice as much, and that an existing highway with estimated significant right-of-way acquisitions or improvements needed would cost 1.5 times as much.

Stakeholder Input

Stakeholder input was received at each stage of the evaluation process, as further discussed in Chapter 7. The evaluation was conducted by a multidisciplinary consultant team, with input from the Project Sponsors (NDOT and ADOT), Core Agency Partners, Stakeholder Partners, and the general public.

Northern Nevada Evaluation Results

The study team conducted the evaluation of all alternatives (please refer to the *Technical Memorandum: Level 1 Evaluation Results Summary*, June 2014).

Each alternative was rated with respect to each of the evaluation criteria. The rating system consisted of a qualitative scale from least to most favorable, with "most favorable" relative rating representing the best performance and "least favorable" relative rating representing the worst performance.

Most Favorable	Somewhat Favorable	Moderately Favorable	Less Favorable	Least Favorable

The evaluation rating scale is strictly relative – alternatives were considered in relation to each other in the same project segment. If an alternative receives the highest rating, it may still face issues or obstacles with respect to that criterion.

A summary rating was applied to all of the alternatives to note their overall ability to meet the goals and objectives as a measure of reasonableness and feasibility. Alternatives ranking "moderately favorable," "less favorable", or "least favorable" typically include a fatal flaw or do not support the project's goals and objectives.

A summary of the evaluation results are presented in **Table 5-2**, listing each member of the universe of alternatives for the Northern Nevada Future Connectivity Corridor, its summary rating, and its recommendation. For this segment, those corridors "recommended for further analysis" will undergo more detailed analysis in future studies.

Table 5-2. Evaluation Results for Northern Nevada

Alternative	Rating Scale	Recommendation
DD		Not Recommended for Further Analysis
EE		Not Recommended for Further Analysis
FF		***Recommended for Further Analysis***
GG		Not Recommended for Further Analysis
HH		Not Recommended for Further Analysis
SS		***Recommended for Further Analysis***
TT		Not Recommended for Further Analysis

The following summary sheets provide an overview of the evaluation results for each alternative in the Northern Nevada Future Connectivity Corridor, including a map of the alternative, alternative description, summary rating scale, and opportunities/constraints of the alternative, followed by the detailed evaluation rating scales and notes.

Alternative DD

Description

This alternative travels through western Nevada to make a northerly connection into California and Oregon, diverting west near Reno.

Recommendation

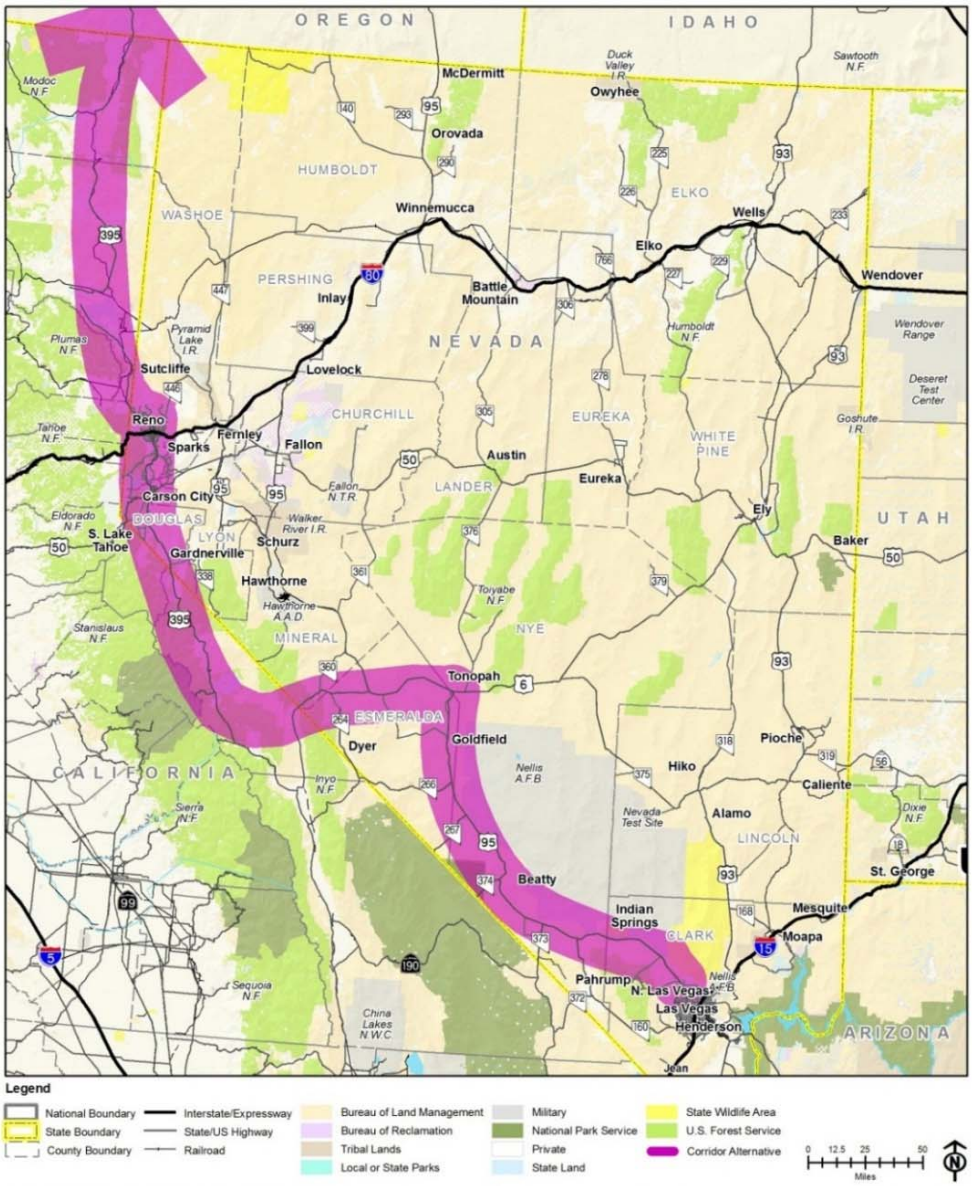
- **Not Recommended for Further Analysis**

Opportunities

- Connects major freight and economic activity centers within Nevada, with opportunities for intermodal connectivity (with UPRR Sparks rail yard, Reno-Tahoe International Airport, Amtrak and I-80)

Constraints

- Environmental constraints along existing US 395 requiring significant upgrades/improvements
- Steep grades in portions are not suitable for rail and difficult for trucks
- Not compatible with major land ownership; traverses U.S. Forest Service land



Alternative DD			
Category	**Criteria**	**Rating**	**Notes**
Legislation	1 How well does the alternative meet the intent of legislative actions, including MAP-21 and the 1995 National Highway Systems Designation Act?		Two corridor components use federal high priority corridor elements (Washoe County Corridor and US 395).
System Linkage	2 How well does this alternative connect major national and international activity centers from Mexico to Canada through the Intermountain West?		Directly connects the Southern California megapolitan (includes Las Vegas) to the Northern California megapolitan (includes Reno).
	3 How well does this alternative most directly close gaps and/or develop missing linkages in the regional and national transportation network?		Closes gaps between I-580 and US 95.
	4 How well does this alternative connect with adjacent segments/sections?		Connects with adjacent segments to the south.
Trade Corridor	5 How well does this alternative connect major freight hubs and high-capacity transportation corridors?		Creates connections between Las Vegas and Reno metropolitan areas and between I-15 and I-80, however, steep grades in portions are difficult for rail and truck transport.
Modal Interrelationships	6 How well does this alternative maximize opportunities for intermodal connectivity (highway, rail/transit, aviation)?		Opportunities for intermodal connectivity with UPRR Sparks rail yard, Reno-Tahoe International Airport, Amtrak and I-80.
	7 How well does this alternative accommodate multiple modes in a shared corridor footprint (highway and rail)?		Accommodation of multiple modes might be difficult due to steep grades on the portion of US 395 south of Reno, and no existence of parallel rail lines.
Capacity/Congestion	8 How well does this alternative relieve existing and projected congestion between and within the major activity centers in Nevada and Arizona?		N/A
	9 How well does this alternative align with existing conditions or proposed improvements at land ports of entry (as appropriate)?		N/A
Economic Vitality	10 How well does this alternative support regional, state and national economic development goals?		Supports many industry cluster targets (mining, gaming, transportation logistics, renewable energy, agriculture).
Project Status/ Transportation Policy	11 How well does this alternative comply with corridor-related actions taken to date?		Uses improved US 95 northwest of Las Vegas, and new I-580.
	12 How well does this alternative conform to locally adopted transportation plans?		Consistent with Connecting Nevada, improves connectivity between Las Vegas and Reno metropolitan areas.
Environmental Sustainability	13 How compatible is this alternative with regional open space, conservation, and land management agency planning?		No known open space constraints.
	14 How well does this alternative minimize environmental impacts (such as drainage, topography, species, and biological connectivity)?		Potential environmental constraints along existing highways, requiring upgrades/improvements. Passes through aboriginal roaming areas.
Land Use and Ownership	15 How consistent is this alternative with regional land use and growth strategies?		Traverses Reno; most consistent with statewide growth strategies.
	16 How compatible is this alternative with major land ownership patterns?		Not compatible with major land ownership; alternative traverses U.S. Forest Service land.
Community Acceptance	17 How well is this alternative accepted by the local communities?		Mostly non-supportive comments.
Cost	18 What is the overall relative cost of this alternative, where “least favorable” is the highest relative cost and “most favorable” the lowest?		

Alternative EE

Description

This alternative travels through western Nevada to make a northerly connection into Oregon through Washoe County.

Recommendation

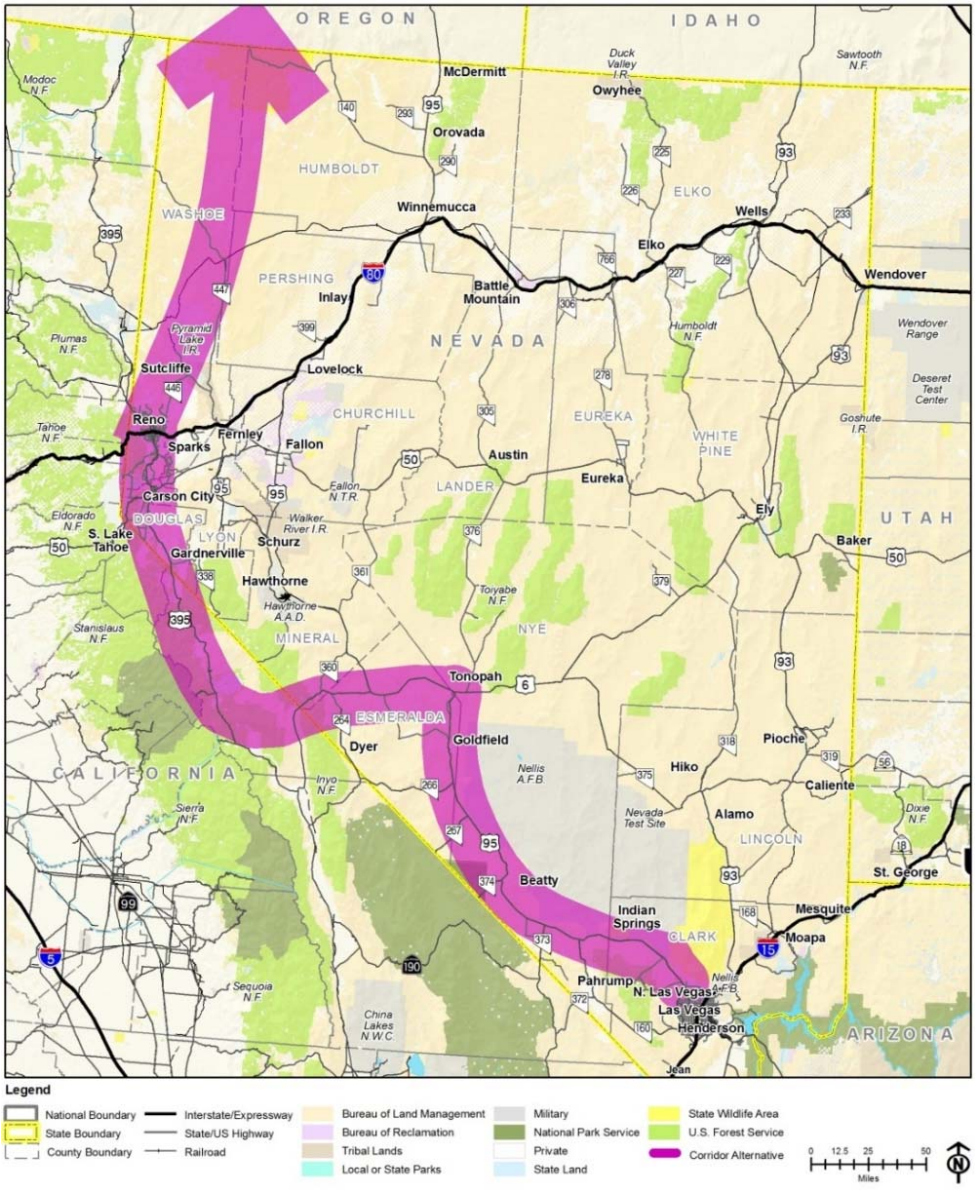
- **Not Recommended for Further Analysis**

Opportunities

- Connects major freight and economic activity centers within Nevada (including Las Vegas and Reno metropolitan areas)
- Closes existing gaps between I-580 and US 95

Constraints

- Traverses National Conservation Area
- Significant environmental constraints (traverses Wilderness Area and does not utilize existing major highways)
- Not consistent with major land ownership patterns (traverses forest service land and Pyramid Lake Paiute tribal lands)



Alternative EE			
Category	**Criteria**	**Rating**	**Notes**
Legislation	1 How well does the alternative meet the intent of legislative actions, including MAP-21 and the 1995 National Highway Systems Designation Act?		One component uses a federal high priority corridor element (Washoe County Corridor).
System Linkage	2 How well does this alternative connect major national and international activity centers from Mexico to Canada through the Intermountain West?		Directly connects the Southern California megapolitan (includes Las Vegas) to the Northern California megapolitan (includes Reno).
	3 How well does this alternative most directly close gaps and/or develop missing linkages in the regional and national transportation network?		Closes gaps between I-580 and US 95.
	4 How well does this alternative connect with adjacent segments/sections?		Connects with adjacent segments to the south.
Trade Corridor	5 How well does this alternative connect major freight hubs and high-capacity transportation corridors?		Creates connections between Las Vegas and Reno metropolitan areas and between I-15 and I-80, however, steep grades in portions are difficult for rail and truck transport.
Modal Interrelationships	6 How well does this alternative maximize opportunities for intermodal connectivity (highway, rail/transit, aviation)?		Opportunities for intermodal connectivity with UPRR Sparks rail yard, Reno-Tahoe International Airport, Amtrak and I-80.
	7 How well does this alternative accommodate multiple modes in a shared corridor footprint (highway and rail)?		Accommodation of multiple modes might be difficult due to steep grades on the portion of US 395 south of Reno, and no existence of parallel rail lines.
Capacity/Congestion	8 How well does this alternative relieve existing and projected congestion between and within the major activity centers in Nevada and Arizona?		N/A
	9 How well does this alternative align with existing conditions or proposed improvements at land ports of entry (as appropriate)?		N/A
Economic Vitality	10 How well does this alternative support regional, state and national economic development goals?		Supports many industry cluster targets (mining, gaming, transportation logistics, renewable energy, agriculture).
Project Status/ Transportation Policy	11 How well does this alternative comply with corridor-related actions taken to date?		Uses improved US 95 northwest of Las Vegas, and new I-580.
	12 How well does this alternative conform to locally adopted transportation plans?		Consistent with Connecting Nevada, improves connectivity between Las Vegas and Reno metropolitan areas.
Environmental Sustainability	13 How compatible is this alternative with regional open space, conservation, and land management agency planning?		Traverses through National Conservation Area.
	14 How well does this alternative minimize environmental impacts (such as drainage, topography, species, and biological connectivity)?		Goes through wilderness area in northeastern Nevada and does not follow existing major highways. Passes through aboriginal roaming areas.
Land Use and Ownership	15 How consistent is this alternative with regional land use and growth strategies?		Traverses Reno; most consistent with statewide growth strategies.
	16 How compatible is this alternative with major land ownership patterns?		Not compatible with major land ownership; alternative traverses U.S. Forest Service and tribal land.
Community Acceptance	17 How well is this alternative accepted by the local communities?		Mostly non-supportive comments.
Cost	18 What is the overall relative cost of this alternative, where “least favorable” is the highest relative cost and “most favorable” the lowest?		

Alternative FF

Description

This alternative loosely follows the US 95 Corridor north from Las Vegas through the Fernley/Fallon area, then on to Oregon and Idaho through Winnemucca.

Recommendation

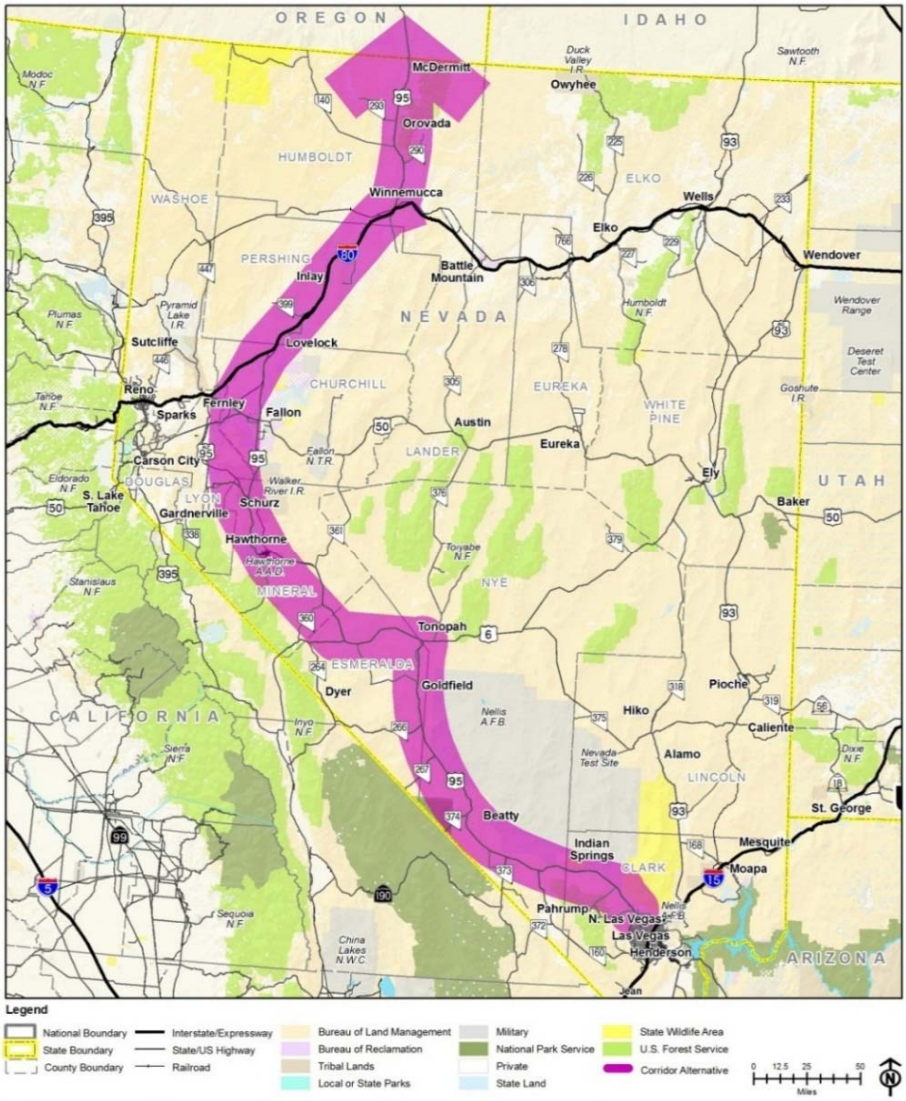
- **Recommended for Further Analysis**

Opportunities

- Connects major freight and economic activity centers within Nevada (including Las Vegas Metropolitan Area, Reno Metropolitan Area through Fernley, and Fernley Industrial Park)
- Potential to accommodate multiple modes in a share corridor with existing rail along the Thorne Branch Line
- Much of corridor follows Congressional high priority corridor (Washoe County Corridor), aligns with US 95 completed improvements northwest of Las Vegas, and provides opportunity to also connect to high priority corridor US 95 from the Oregon state border to the Canadian border

Constraints

- Potential environmental constraints



Alternative FF			
Category	**Criteria**	**Rating**	**Notes**
Legislation	1 How well does the alternative meet the intent of legislative actions, including MAP-21 and the 1995 National Highway Systems Designation Act?		Portions of corridor use a federal high priority corridor element (Washoe County Corridor) and provides opportunity to also connect to high priority corridor (US 95 from the Oregon state border to the Canadian border).
System Linkage	2 How well does this alternative connect major national and international activity centers from Mexico to Canada through the Intermountain West?		Directly connects the Southern California megapolitan (includes Las Vegas) to the Northern California megapolitan (includes Reno/Fernley).
	3 How well does this alternative most directly close gaps and/or develop missing linkages in the regional and national transportation network?		Develops higher capacity linkage.
	4 How well does this alternative connect with adjacent segments/sections?		Connects with adjacent segments to the south.
Trade Corridor	5 How well does this alternative connect major freight hubs and high-capacity transportation corridors?		Creates connections between Las Vegas and Fernley (including Fernley Industrial Park) and between I-15 and I-80.
Modal Interrelationships	6 How well does this alternative maximize opportunities for intermodal connectivity (highway, rail/transit, aviation)?		Opportunities for intermodal connectivity with Fernley Industrial Park, Amtrak and I-80.
	7 How well does this alternative accommodate multiple modes in a shared corridor footprint (highway and rail)?		Connection between Tonopah and Fernley is along existing rail line (Thorne Branch Line).
Capacity/Congestion	8 How well does this alternative relieve existing and projected congestion between and within the major activity centers in Nevada and Arizona?		N/A
	9 How well does this alternative align with existing conditions or proposed improvements at land ports of entry (as appropriate)?		N/A
Economic Vitality	10 How well does this alternative support regional, state and national economic development goals?		Supports many industry cluster targets (defense, mining, gaming, transportation logistics, renewable energy, agriculture).
Project Status/ Transportation Policy	11 How well does this alternative comply with corridor-related actions taken to date?		Uses improved US 95 northwest of Las Vegas.
	12 How well does this alternative conform to locally adopted transportation plans?		Consistent with Nevada State Rail Plan and Connecting Nevada, improves connectivity between Las Vegas and Reno metropolitan areas.
Environmental Sustainability	13 How compatible is this alternative with regional open space, conservation, and land management agency planning?		No known open space constraints.
	14 How well does this alternative minimize environmental impacts (such as drainage, topography, species, and biological connectivity)?		Potential environmental constraints along existing highways, requiring fewer upgrades/improvements. Passes through aboriginal roaming areas.
Land Use and Ownership	15 How consistent is this alternative with regional land use and growth strategies?		Provides connection to Reno; most consistent with statewide growth strategies.
	16 How compatible is this alternative with major land ownership patterns?		Wide corridor swath; generally compatible with major land ownership.
Community Acceptance	17 How well is this alternative accepted by the local communities?		Mostly supportive comments.
Cost	18 What is the overall relative cost of this alternative, where “least favorable” is the highest relative cost and “most favorable” the lowest?		

Alternative GG

Description

This alternative travels through central Nevada to make a northerly connection into Oregon through Winnemucca.

Recommendation

- **Not Recommended for Further Analysis**

Opportunities

- Provides opportunity to connect to a high priority corridor (US 95 from the Oregon state border to the Canadian border)

Constraints

- Connects limited number of major freight and economic activity centers and has limited opportunities for intermodal connectivity
- Because of limited connectivity, does not fully support economic development goals
- Not consistent with transportation plans, such as Connecting Nevada (does not improve connections between Las Vegas and Reno metropolitan areas or between Las Vegas and eastern Nevada)

Alternative GG			
Category	**Criteria**	**Rating**	**Notes**
Legislation	1 How well does the alternative meet the intent of legislative actions, including MAP-21 and the 1995 National Highway Systems Designation Act?		One corridor component uses a federal high priority corridor element (Washoe County Corridor) and provides opportunity to also connect to high priority corridor (US 95 from the Oregon state border to the Canadian border).
System Linkage	2 How well does this alternative connect major national and international activity centers from Mexico to Canada through the Intermountain West?		Connects to the Southern California megapolitan (includes Las Vegas).
	3 How well does this alternative most directly close gaps and/or develop missing linkages in the regional and national transportation network?		Develops higher capacity linkage.
	4 How well does this alternative connect with adjacent segments/sections?		Connects with adjacent segments to the south.
Trade Corridor	5 How well does this alternative connect major freight hubs and high-capacity transportation corridors?		Creates connections between I-15 and I-80.
Modal Interrelationships	6 How well does this alternative maximize opportunities for intermodal connectivity (highway, rail/transit, aviation)?		Limited opportunities for intermodal connectivity include Amtrak and I-80.
	7 How well does this alternative accommodate multiple modes in a shared corridor footprint (highway and rail)?		Wide corridor swath; might accommodate highway and rail.
Capacity/Congestion	8 How well does this alternative relieve existing and projected congestion between and within the major activity centers in Nevada and Arizona?		N/A
	9 How well does this alternative align with existing conditions or proposed improvements at land ports of entry (as appropriate)?		N/A
Economic Vitality	10 How well does this alternative support regional, state and national economic development goals?		Supports some industry cluster targets (mining, renewable energy, agriculture).
Project Status/ Transportation Policy	11 How well does this alternative comply with corridor-related actions taken to date?		Uses improved US 95 northwest of Las Vegas.
	12 How well does this alternative conform to locally adopted transportation plans?		Not consistent with Connecting Nevada.
Environmental Sustainability	13 How compatible is this alternative with regional open space, conservation, and land management agency planning?		No known open space constraints.
	14 How well does this alternative minimize environmental impacts (such as drainage, topography, species, and biological connectivity)?		Potential traversal of steep slopes, areas of critical environmental concern, wilderness areas, and drainage corridors. Passes through aboriginal roaming areas.
Land Use and Ownership	15 How consistent is this alternative with regional land use and growth strategies?		Supports community development; although major trade corridor not in regional land use plans.
	16 How compatible is this alternative with major land ownership patterns?		Wide corridor swath; generally compatible with major land ownership.
Community Acceptance	17 How well is this alternative accepted by the local communities?		No comments.
Cost	18 What is the overall relative cost of this alternative, where “least favorable” is the highest relative cost and “most favorable” the lowest?		

Alternative HH

Description

This alternative travels through eastern Nevada to make a northerly connection into Idaho (centered on the existing US-93 corridor).

Recommendation

- **Not Recommended for Further Analysis**

Opportunities

- Can accommodate multiple modes; majority of corridor is along existing rail line (South Central Route and Nevada Northern Railway)
- Consistent with several statewide transportation and economic development goals

Constraints

- Does not efficiently connect the Southern California megapolitan (includes Las Vegas) to the Northern California megapolitan (includes Reno)
- Compared to other alternatives, connects a fewer number of major freight and economic activity centers
- Not as consistent with interstate transportation and economic development goals as other alternatives

Alternative HH				
Category		**Criteria**	**Rating**	**Notes**
Legislation	1	How well does the alternative meet the intent of legislative actions, including MAP-21 and the 1995 National Highway Systems Designation Act?		Uses no federal high priority corridor components.
System Linkage	2	How well does this alternative connect major national and international activity centers from Mexico to Canada through the Intermountain West?		Connects to the Southern California megapolitan (includes Las Vegas), but does not efficiently connect to the Northern California megapolitan (includes Reno).
	3	How well does this alternative most directly close gaps and/or develop missing linkages in the regional and national transportation network?		Develops higher capacity linkage.
	4	How well does this alternative connect with adjacent segments/sections?		Connects with adjacent segments to the south.
Trade Corridor	5	How well does this alternative connect major freight hubs and high-capacity transportation corridors?		Creates connections between I-15 and I-80.
Modal Interrelationships	6	How well does this alternative maximize opportunities for intermodal connectivity (highway, rail/transit, aviation)?		Opportunities for intermodal connectivity with Carlin rail yard, Amtrak and I-80.
	7	How well does this alternative accommodate multiple modes in a shared corridor footprint (highway and rail)?		Majority of corridor is along existing rail line (South Central Route and Nevada Northern Railway).
Capacity/ Congestion	8	How well does this alternative relieve existing and projected congestion between and within the major activity centers in Nevada and Arizona?		N/A
	9	How well does this alternative align with existing conditions or proposed improvements at land ports of entry (as appropriate)?		N/A
Economic Vitality	10	How well does this alternative support regional, state and national economic development goals?		Supports some industry cluster targets (mining, renewable energy, agriculture).
Project Status/ Transportation Policy	11	How well does this alternative comply with corridor-related actions taken to date?		No known recent corridor-related actions taken to date.
	12	How well does this alternative conform to locally adopted transportation plans?		Consistent with Nevada State Rail Plan and Connecting Nevada, improves connectivity between Las Vegas Metropolitan Area and eastern Nevada.
Environmental Sustainability	13	How compatible is this alternative with regional open space, conservation, and land management agency planning?		No known open space constraints.
	14	How well does this alternative minimize environmental impacts (such as drainage, topography, species, and biological connectivity)?		Potential environmental constraints along existing highways, requiring fewer upgrades/improvements. Passes through Confederated Tribes of the Goshute Reservation aboriginal roaming area.
Land Use and Ownership	15	How consistent is this alternative with regional land use and growth strategies?		Supports community development; consistent with Great Basin Regional Development Authority growth strategies.
	16	How compatible is this alternative with major land ownership patterns?		Wide corridor swath; generally compatible with major land ownership.
Community Acceptance	17	How well is this alternative accepted by the local communities?		Mixed comments.
Cost	18	What is the overall relative cost of this alternative, where “least favorable” is the highest relative cost and “most favorable” the lowest?		

Alternative SS

Description

This alternative loosely follows the US 95 Corridor north from Las Vegas to Interstate 80, then west to US 395 in Reno, then makes a northerly connection into California and Oregon.

Recommendation

- **Recommended for Further Analysis**

Opportunities

- Connects major freight and economic activity centers within Nevada (including Las Vegas and Reno metropolitan areas, Tahoe-Reno Industrial Center, and Fernley Industrial Park)
- Closes gaps between two Congressionally designated corridors (Washoe County Corridor and US 395) and aligns with US 95 completed improvements northwest of Las Vegas and potential use of USA Parkway between US-50 and I-80
- Opportunities for intermodal connectivity with UPRR Sparks rail yard, Tahoe-Reno Industrial Center, Fernley Industrial Park, Reno-Tahoe International Airport, Amtrak and I-80

Constraints

- Potential environmental constraints

Alternative SS			
Category	**Criteria**	**Rating**	**Notes**
Legislation	1 How well does the alternative meet the intent of legislative actions, including MAP-21 and the 1995 National Highway Systems Designation Act?		Majority of segments are components of federal high priority corridors (Washoe County Corridor and US 395).
System Linkage	2 How well does this alternative connect major national and international activity centers from Mexico to Canada through the Intermountain West?		Directly connects the Southern California megapolitan (includes Las Vegas) to the Northern California megapolitan (includes Reno/Fernley).
	3 How well does this alternative most directly close gaps and/or develop missing linkages in the regional and national transportation network?		Closes gaps between two Congressionally designated corridors (US 95 and US 395).
	4 How well does this alternative connect with adjacent segments/sections?		Connects with adjacent segments to the south.
Trade Corridor	5 How well does this alternative connect major freight hubs and high-capacity transportation corridors?		Creates connections between Las Vegas, Reno metropolitan areas (including the Tahoe-Reno Industrial Center), Fernley (including the Fernley Industrial Park) and between I-15 and I-80.
Modal Interrelationships	6 How well does this alternative maximize opportunities for intermodal connectivity (highway, rail/transit, aviation)?		Opportunities for intermodal connectivity with UPRR Sparks rail yard, Tahoe-Reno Industrial Center, Reno-Tahoe International Airport, Fernley Industrial Park, Amtrak and I-80.
	7 How well does this alternative accommodate multiple modes in a shared corridor footprint (highway and rail)?		Connection between Tonopah and Fernley is along existing rail line (Thorne Branch Line).
Capacity/Congestion	8 How well does this alternative relieve existing and projected congestion between and within the major activity centers in Nevada and Arizona?		N/A
	9 How well does this alternative align with existing conditions or proposed improvements at land ports of entry (as appropriate)?		N/A
Economic Vitality	10 How well does this alternative support regional, state and national economic development goals?		Supports many industry cluster targets (defense, mining, gaming, transportation logistics, renewable energy, agriculture).
Project Status/ Transportation Policy	11 How well does this alternative comply with corridor-related actions taken to date?		Uses improved US 95 northwest of Las Vegas and potentially USA Parkway between US-50 and I-80.
	12 How well does this alternative conform to locally adopted transportation plans?		Consistent with Connecting Nevada, improves connectivity between Las Vegas and Reno metropolitan areas.
Environmental Sustainability	13 How compatible is this alternative with regional open space, conservation, and land management agency planning?		No known open space constraints
	14 How well does this alternative minimize environmental impacts (such as drainage, topography, species, and biological connectivity)?		Potential environmental constraints along existing highways, requiring fewer upgrades/improvements. Passes through aboriginal roaming areas.
Land Use and Ownership	15 How consistent is this alternative with regional land use and growth strategies?		Traverses Reno; most consistent with statewide growth strategies.
	16 How compatible is this alternative with major land ownership patterns?		Wide corridor swath; generally compatible with major land ownership.
Community Acceptance	17 How well is this alternative accepted by the local communities?		Mixed comments.
Cost	18 What is the overall relative cost of this alternative, where “least favorable” is the highest relative cost and “most favorable” the lowest?		

Alternative TT

Description

This alternative travels through eastern Nevada to make a connection at Elko with the ability to travel east, west, or north.

Recommendation

- **Not Recommended for Further Analysis**

Opportunities

- Opportunities for intermodal connectivity with Elko Regional Airport, Elko rail yard, Elko Regional Railport, Amtrak and I-80

Constraints

- Does not efficiently connect the Southern California megapolitan (includes Las Vegas) to the Northern California megapolitan (includes Reno)
- Compared to other alternatives, connects a fewer number of major freight and economic activity centers
- Potential environmental constraints

Alternative TT			
Category	**Criteria**	**Rating**	**Notes**
Legislation	1 How well does the alternative meet the intent of legislative actions, including MAP-21 and the 1995 National Highway Systems Designation Act?		Uses no federal high priority corridor components.
System Linkage	2 How well does this alternative connect major national and international activity centers from Mexico to Canada through the Intermountain West?		Connects to the Southern California megapolitan (includes Las Vegas) but does not efficiently connect to the Northern California megapolitan (includes Reno).
	3 How well does this alternative most directly close gaps and/or develop missing linkages in the regional and national transportation network?		Develops higher capacity linkage.
	4 How well does this alternative connect with adjacent segments/sections?		Connects with adjacent segments to the south.
Trade Corridor	5 How well does this alternative connect major freight hubs and high-capacity transportation corridors?		Creates connections between Las Vegas and freight hubs in Elko (Elko Regional Railport) and between I-15 and I-80.
Modal Interrelationships	6 How well does this alternative maximize opportunities for intermodal connectivity (highway, rail/transit, aviation)?		Opportunities for intermodal connectivity with Elko Regional Airport, Elko rail yard, Elko Regional Railport, Amtrak and I-80.
	7 How well does this alternative accommodate multiple modes in a shared corridor footprint (highway and rail)?		Wide corridor swath; might accommodate highway and rail.
Capacity/Congestion	8 How well does this alternative relieve existing and projected congestion between and within the major activity centers in Nevada and Arizona?		N/A
	9 How well does this alternative align with existing conditions or proposed improvements at land ports of entry (as appropriate)?		N/A
Economic Vitality	10 How well does this alternative support regional, state and national economic development goals?		Supports some industry cluster targets (mining, renewable energy, agriculture).
Project Status/ Transportation Policy	11 How well does this alternative comply with corridor-related actions taken to date?		No known recent corridor-related actions taken to date.
	12 How well does this alternative conform to locally adopted transportation plans?		Consistent with Connecting Nevada, improves connectivity between Las Vegas Metropolitan Area and eastern Nevada.
Environmental Sustainability	13 How compatible is this alternative with regional open space, conservation, and land management agency planning?		No known open space constraints.
	14 How well does this alternative minimize environmental impacts (such as drainage, topography, species, and biological connectivity)?		Potential traversal of steep slopes, areas of critical environmental concern, wilderness areas, and drainage corridors. Passes through aboriginal roaming areas.
Land Use and Ownership	15 How consistent is this alternative with regional land use and growth strategies?		Supports community development; consistent with Great Basin Regional Development Authority growth strategies.
	16 How compatible is this alternative with major land ownership patterns?		Wide corridor swath; generally compatible with major land ownership
Community Acceptance	17 How well is this alternative accepted by the local communities?		No comments.
Cost	18 What is the overall relative cost of this alternative, where “least favorable” is the highest relative cost and “most favorable” the lowest?		

6. Findings and Recommendations

Recommendation for Further Analysis

For the Northern Nevada Future Connectivity Corridor, two alternative corridors are recommended as potential candidates for an I-11 and Intermountain West trade corridor, to undergo further analysis in future studies. These include Alternatives FF and SS, which both connect the Las Vegas Metropolitan Area to northwestern Nevada continuing north to the Oregon border for Alternative FF and the California border for SS (**Figure 6-1**). While not recommended as candidate I-11 and Intermountain West Corridors, Alternatives HH and TT (corridor options in eastern Nevada) are recommended for further consideration as key multimodal transportation links of statewide economic importance, to be elaborated further below.

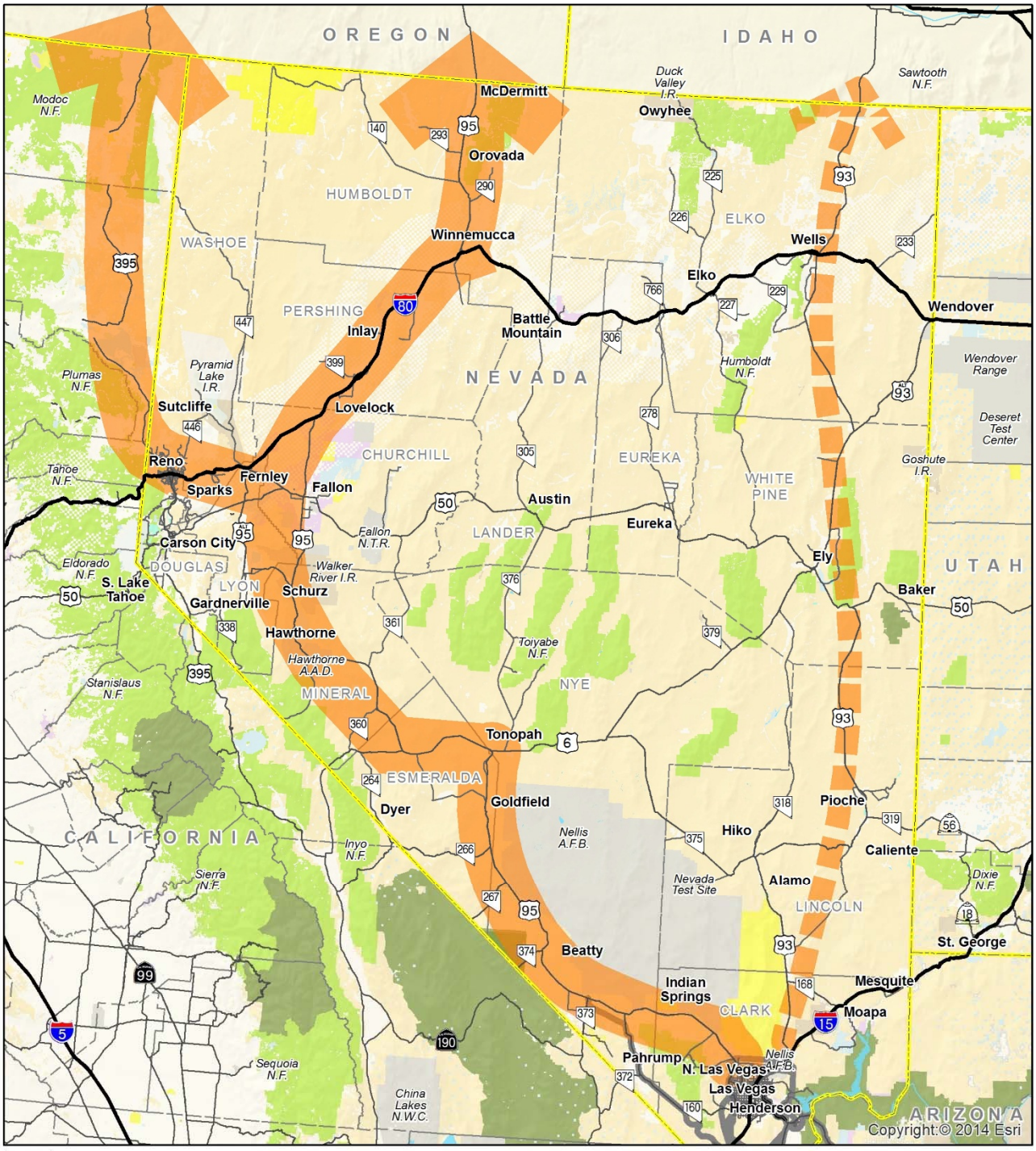
Alternatives FF and SS were found to be the most favorable corridor connections based on a number of factors, as discussed in the evaluation screening results in Chapter 5. As noted previously, this study adheres to the PEL process. While a review of known environmental factors was performed, more detailed analysis is required to select a specific alignment within these broad corridors. The full PEL documentation for the recommended corridor connections is available as its own technical report.

Corridor Opportunities

The summary of major opportunities that Alternative FF (US 95 corridor) provides include:

- Connects major freight and economic activity centers within Nevada (including Las Vegas Metropolitan Area, Reno Metropolitan Area through Fernley, and Fernley Industrial Park); improves connectivity and creates more efficient and higher capacity transportation connection between the two largest economic centers in Nevada.
- Potential to accommodate multiple modes in a shared corridor with existing rail along the Thorne Branch Line.
- Much of alternative follows Congressional high priority corridor (Washoe County Corridor) and provides opportunity to also connect to high priority corridor US 95 from the Oregon state border to the Canadian border.
- Supports many industry cluster targets (defense, mining, gaming, transportation logistics, renewable energy, agriculture, etc.).

Figure 6-1. Alternative Corridor Connections Recommended for Further Analysis



ALL INFORMATION IS PRELIMINARY / SUBJECT TO REVISION

Maps identify desired connections between project geographic segments. Alternatives do not identify specific alignments, nor preclude multiple alignments within each alternative.

The summary of major opportunities that Alternative SS (US 95 and US 395 corridors) provides include:

- Connects major freight and economic activity centers within Nevada (including Las Vegas and Reno Metropolitan Areas, Tahoe-Reno Industrial Center, and Fernley Industrial Park); improves connectivity and creates more efficient and higher capacity transportation connection between the two largest economic centers in Nevada.
- Closes gaps between two Congressionally-designated high priority corridors (Washoe County Corridor and US 395) and aligns with US 95 completed improvements northwest of Las Vegas and potential use of USA Parkway between US-50 and I-80.
- Opportunities for intermodal connectivity with UPRR Sparks rail yard, Tahoe-Reno Industrial Center, Fernley Industrial Park, Reno-Tahoe International Airport, Amtrak and I-80.
- Potential to accommodate multiple modes in a shared corridor with existing rail along the Thorne Branch Line.
- Supports many industry cluster targets (including but not limited to defense, mining, gaming, transportation logistics, renewable energy, agriculture).

Challenges for Implementation

The following steps are recommended to fully address potential challenges through further evaluation in future studies:

- Close coordination with project stakeholders and public at-large. Underlying federal land ownership patterns could pose a challenge, with several large military installations, national parks, and national forests located in northwestern Nevada, proximate to corridor recommendations. An effort will need to be made to balance the provision of access to such destinations, while not traversing protected areas.
- Much more detailed environmental review will be required to determine the least impactful and most cost effective corridor solution. Topography will be a challenge for both corridors, due to the mountainous terrain. While potential environmental constraints may be lower along existing state highways, there is no direct connection between the Las Vegas and Reno area, likely requiring some corridor upgrades to create a more direct and consistent high-capacity route. Also, these corridors potentially pass through aboriginal roaming areas, which could impact wildlife movement and connectivity.
- Continued coordination with neighboring states will be necessary to understand the best corridor connection point to Canada, including the path of travel through states north of Nevada. To date, conversations have occurred with state DOT representatives from California, Idaho, and Oregon. Their commitments and challenges to implementing such a corridor will need to be understood to develop and define segments of independent utility and logical termini.

Corridors of Statewide Economic Importance

Alternatives HH and TT (corridor options in eastern Nevada) are recommended for further consideration as key multimodal transportation links of statewide economic importance. *Connecting Nevada* recommends improved connectivity between Las Vegas and Reno as well as Las Vegas and the eastern part of the state. Both Alternatives HH and TT are consistent with *Connecting Nevada* in that they improve connectivity between the Las Vegas Metropolitan Area and eastern Nevada. The *Nevada State Rail Plan* recommends improvements to existing rail lines in northern Nevada. Alternative HH may be able to accommodate multiple modes in a shared alignment as the majority of the corridor alternative is along existing South Central Route and Nevada Northern Railway. Alternative TT provides a connection to Elko with opportunities

for intermodal connectivity with Elko Regional Airport, Elko rail yard, Elko Regional Railport, Amtrak and I-80.

White Pine County submitted a letter regarding the advantages and opportunities with these eastern alignments (see Appendix B). Eastern Nevada is on the forefront of new energy development with the only major wind farm in Nevada, and potential to utilize biomass, hydro and solar for future energy projects. It will continue to provide a strong tax base for Nevada with its mining, oil and gas, and renewable energy industries, and a high-capacity transportation link would provide economic benefits to further improve the economy in eastern Nevada.

These eastern alternatives do not meet the goals and objectives of the I-11 and Intermountain West Corridor, however, these corridors support overall regional community development and are consistent with several statewide transportation and economic development goals. Therefore, this study recommends that NDOT and local governments proceed with further study of these corridors as key multimodal transportation links which will support not only regional but also and statewide mobility needs.

Multi-Use Considerations

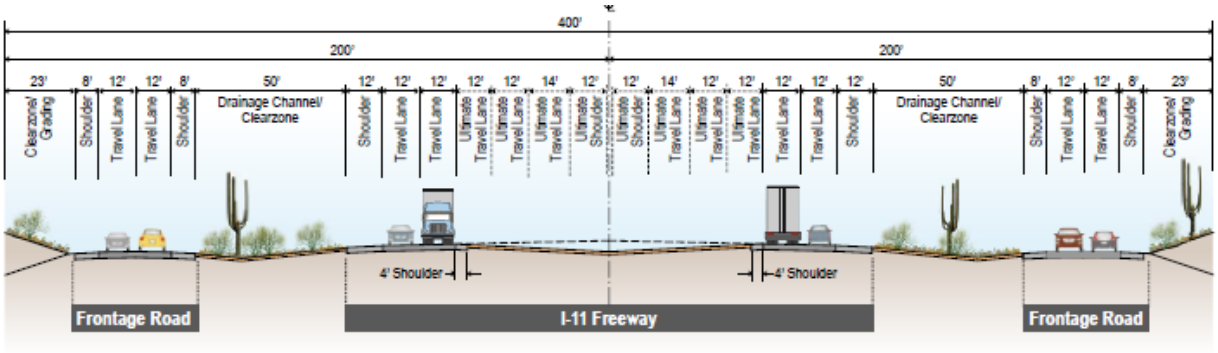
As the Goals and Objectives for the I-11 and Intermountain West Corridor recognize the importance and need for accommodating multiple modes and multiple uses within the corridor's footprint, each corridor alternative was rated based on its ability to accommodate multiple modes and multiple uses (highway, rail, and utilities) through the Modal Interrelationships evaluation category.

Several possible typical sections (or footprints) for the various modal options within the I-11 and Intermountain West Corridor were developed to assist in estimation of multi-use feasibility. The possible footprints include (1) the accommodation of multiple uses and modes (highway, rail, and utilities) (800-foot width), (2) highway and utilities (700-foot width), or (3) highway only (400-foot width) (**Figure 6-2**).

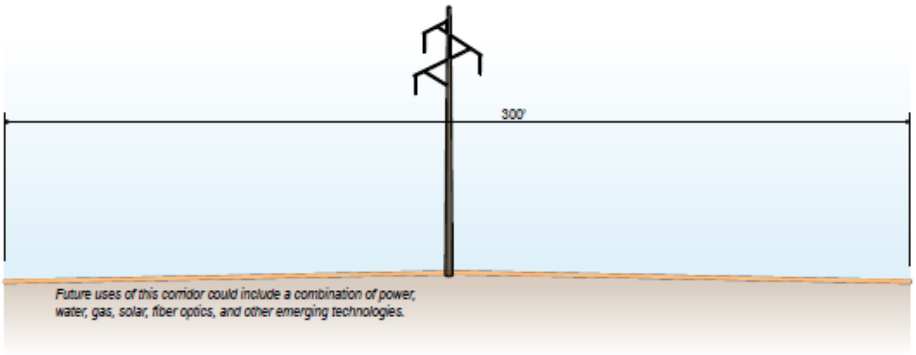
Through this analysis, it was discovered that the many alternative corridors are not able to accommodate multiple modes, specifically rail, throughout the entire length of the corridor due to right-of-way or terrain constraints. Interstates usually have a maximum grade rate of 6 percent, while rail typically has 1.5 percent maximum grades (2 percent for short distances). Therefore, alternate rail corridors were proposed for possible consideration in on-going and future planning studies conducted by public agencies and private sector stakeholders.

Figure 6-3 indicates those portions of the alternatives that are not suitable as multimodal corridors, and suggests possible new rail corridors for future consideration that could close north-south gaps in the existing rail network. These suggestions will require detailed analyses, and are illustrated here primarily to delineate the possibilities for rail enhancements in the region that are complimentary with an I-11 and Intermountain West Corridor. While private rail companies are responsible for decisions regarding their networks, it is hoped that the analyses and recommendations proposed in this study will offer insight and support for those decisions, as well as future partnering opportunities.

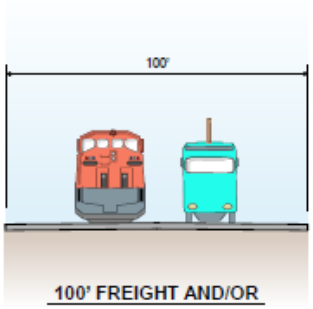
Figure 6-2. I-11 Potential Cross-sections Accommodating Multiple Uses and Modes



400' HIGHWAY SECTION: 4 LANE (10 LANE ULTIMATE)



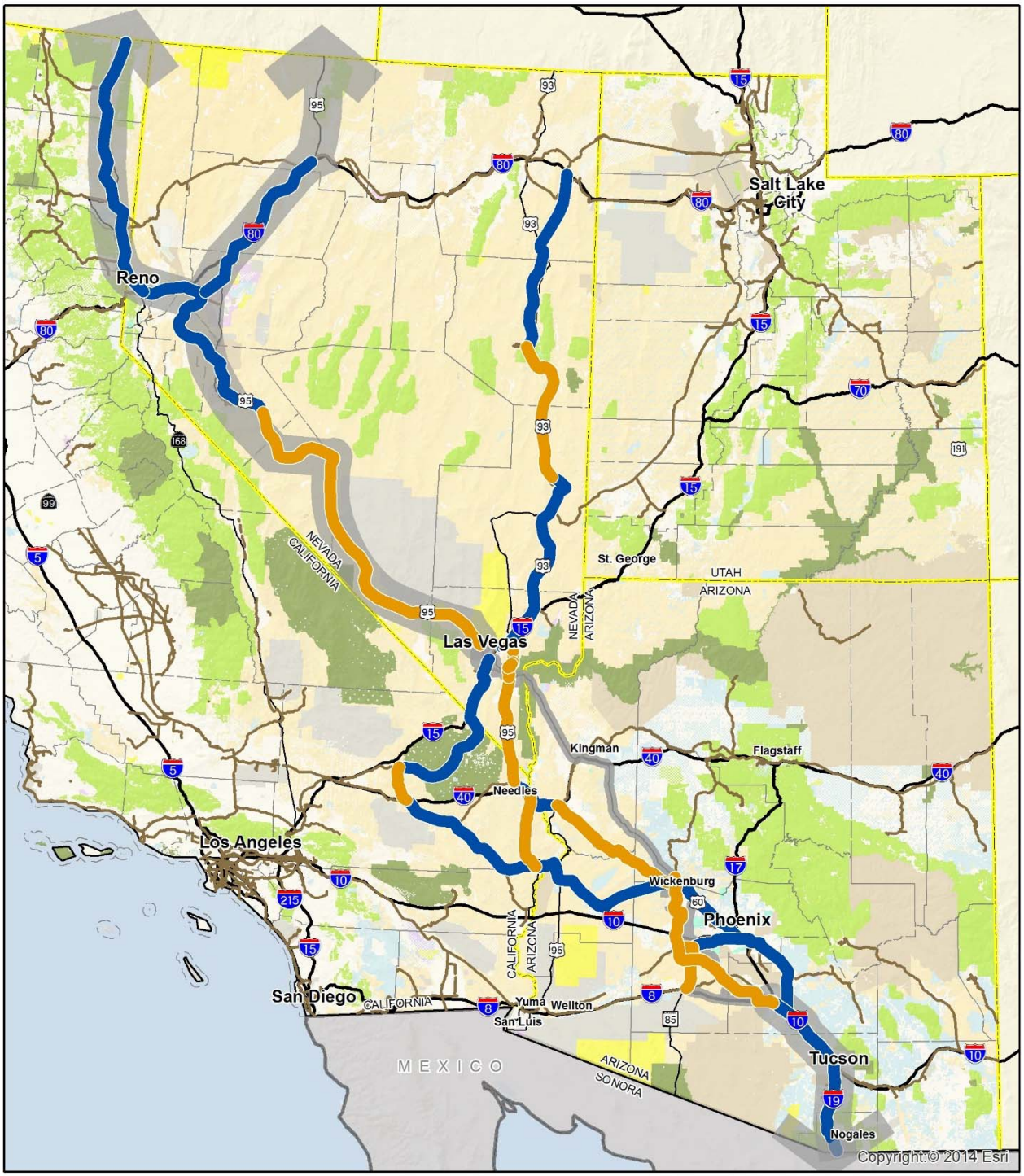
300' CORRIDOR FOR MULTIPLE UTILITIES



100' FREIGHT AND/OR PASSENGER RAIL CORRIDOR

Note:
400' Highway Section + 300' Utility Corridor + 100' Rail Corridor = 800' Right-of-Way
400' Highway Section + 300' Utility Corridor = 700' Right-of-Way

Figure 6-3. Multimodal Considerations



Legend

National Boundary
State Boundary
County Boundary
Interstate/Expressway
State/US Highway
Existing Rail Network
Recommended Corridor Connection
Existing Rail Corridors
Potential Alternate Rail Corridors

0 25 50 100
Miles

ALL INFORMATION IS PRELIMINARY / SUBJECT TO REVISION

Maps identify desired connections between metropolitan areas. Alternatives do not identify specific alignments, nor preclude multiple alignments within each alternative.

7. Stakeholder Involvement Summary

As noted previously, ADOT, NDOT, FHWA, FRA, MAG, and the RTC comprised a project oversight committee entitled the Core Agency Partners (CAP). In addition, interested public agencies, non-profit organizations and private interest groups were invited to participate in a Stakeholder Partners committee that was asked to provide data and other input, and to share their opinions and ideas at milestone decision points throughout the planning process. The public at large was also consulted to receive community input at key points of the process.

As part of this study effort, project constituents were specifically invited to participate in a series of meetings for Phase 3 of the project which was dedicated to identifying and evaluating alternatives, ultimately recommending a preferred corridor(s) for further consideration, and preparing the Corridor Concept Report.

To encourage participation, meetings were held in various locations and often offered the opportunity to participate via Webinar. **Table 7-1** lists the formal meetings held throughout the project, with specific dates noted for those regarding the future connectivity corridor.

In July 2013, the first of this meeting series occurred to review the results of the Corridor Justification Report, as well as to discuss and receive feedback on the Goals and Objectives, evaluation framework, and alternative modes to be considered for the Corridor. The purpose of this series of meetings was to receive feedback from Stakeholder Partners on the process and criteria that would be used to evaluate alternative corridors.

In August 2013, the second of this meeting series occurred to review the universe of possible alternatives for the Corridor, with the intent to receive feedback on the range of alternative corridor concepts to be evaluated.

In October 2013, the third meeting series occurred to review the results of the screening of alternatives and to receive feedback on the evaluation outcomes and recommendations.

In February 2014, a fourth round of engagement occurred to present and receive feedback on the draft recommendations for the Northern Nevada Future Connectivity Corridor. This round of engagement was facilitated “virtually” whereby interested individuals could view a narrated presentation about the current status of the study and then submit comments online via the project website. An invitation to participate was emailed to those in the project database, and stakeholders were encouraged to assist in soliciting feedback from their constituents. In partnership with ADOT and NDOT, a press release was distributed that resulted in significant media attention, in addition to three advertisements purchased by ADOT and published in the Arizona Republic. Feedback for this phase was solicited from February 10 through March 10, 2014.

The March, May, and June 2014 meetings consisted of discussions regarding the final recommended alternatives for all segments, the Corridor Implementation Program, Purpose and Need, Business Case, and finally the Corridor Concept Report. A concluding round of virtual public outreach will be held in June 2014.

Table 7-1. Public and Stakeholder Evaluation Process Meetings

Date	Meeting	Purpose
June 27, 2013	Core Agency Partners	Discuss the Goals and Objectives, and Evaluation process and criteria
July 22, 2013	Separate Stakeholder Partner meetings with all 5 geographic segments (175 participants)	Discuss the Goals and Objectives, and Evaluation process and criteria
July 30, 2013	Core Agency Partners	Discuss the Universe of Alternatives
August 12, 2013	Separate Stakeholder Partner meetings with all 5 geographic segments (193 participants)	Discuss the Universe of Alternatives
September 24, 2013	Core Agency Partners	Discuss Level 1 screening results and Level 2 screening criteria
October 16, 2013	Separate Stakeholder Partner meetings with all 5 geographic segments (166 participants)	Discuss Level 1 screening results and Level 2 screening criteria
October 16, 2013	Separate Public meetings in all 5 geographic segments (274 participants)	Discuss Level 1 screening results and Level 2 screening criteria
February 2014	Joint virtual public meeting in all 5 geographic segments	Discuss preliminary Recommended Alternatives
March 12, 2014	Core Agency Partners	Discuss Recommended Alternatives, and approach to Implementation Program, Purpose and Need, and Business Case
March 19, 2014	Joint Stakeholder Partner meeting with all 5 geographic segments	Discuss Recommended Alternatives, and approach to Implementation Program, Purpose and Need, and Business Case
May 14, 2014	Core Agency Partners	Present draft Implementation Program and Business Case
May 21, 2014	Joint Stakeholder Partner meeting with all 5 geographic segments	Present draft Implementation Program and Business Case
June 11, 2014	Core Agency Partners	Present draft Corridor Concept Report and public meeting materials
June 2014	Joint virtual public meeting in all 5 geographic segments	Present draft Corridor Concept Report and final study recommendations

8. Acronyms and Abbreviations

ACEC	area of critical environmental concern
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
BLM	Bureau of Land Management
bqAZ	Building a Quality Arizona
CANAMEX	Congressionally-designated high priority transportation corridor connecting Canada and Mexico through the United States
CAP	Core Agency Partners
Ferromex	Ferrocarril Mexicano
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
I	Interstate
LPOE	land port of entry
MAP-21	Moving Ahead for Progress in the 21st Century
NAFTA	North American Free Trade Agreement
NCA	National Conservation Area
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
PEL	Planning and Environmental Linkages
POLA/POLB	Port of Los Angeles/Port of Long Beach
RTC	Regional Transportation Commission of Southern Nevada
RTP	Regional Transportation Plan
SR	State Route
UPRR	Union Pacific Railroad
U.S.	United States

9. References

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Appendix A
Goals and Objectives

Interstate 11 and Intermountain West Corridor Study

Preliminary Goals and Objectives Statement

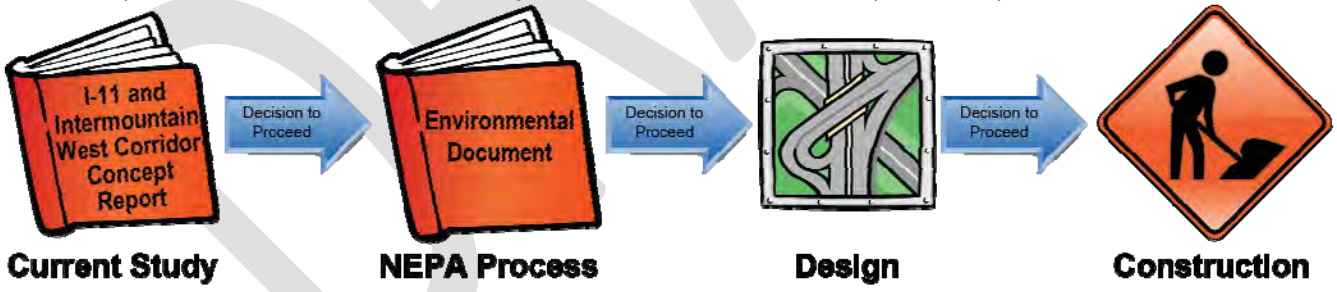
Background

Study Process

The Arizona Department of Transportation (ADOT) and Nevada DOT (NDOT), in consultation with the Federal Highway Administration (FHWA) and the Federal Railroad Administration (FRA), and in partnership with the Maricopa Association of Governments (MAG) and the Regional Transportation Commission of Southern Nevada (RTC) referred to as Core Agency Partners, are conducting the Interstate 11 (I-11) and Intermountain West Corridor Study. The study is the latest action in a decades-long effort by Arizona, Nevada, and other Intermountain West states and the federal government to develop a transportation corridor between the Rocky Mountains and the Cascade Range/Sierra Nevada Mountains linking Mexico and Canada. The 2-year study includes detailed corridor planning of a possible high-capacity transportation link connecting Phoenix and Las Vegas and high-level visioning for extending the corridor north of Las Vegas to Canada and south of Phoenix to Mexico.

This corridor study is a Planning and Environment Linkages (PEL) case study. The PEL process, which is supported by FHWA, is an integrated approach to transportation decision-making that takes into account environmental, community, and economic goals throughout the project life cycle, from the planning stage (current study) through development (National Environmental Policy Act [NEPA] phase), design, and construction/maintenance. PEL promotes greater communication within and among transportation and resource agencies, leading to improved decision-making and project development.[1] ADOT and NDOT have worked with FHWA to adapt the federal guidance into state-led processes, which include a series of checklists to be completed throughout a study's process.

For studies, analyses, or conclusions from the transportation planning process (such as the study at hand) to be used in a future NEPA phase, they must meet certain standards established by NEPA. This is because the information and products coming from the planning process must be sufficiently comprehensive that the federal government may reasonably rely upon them in its NEPA analysis and documentation. A sound planning process is a primary source of a future project purpose and need. It is through the planning process that state and local governments determine an area's transportation needs, which needs they wish to address, and in what period they wish to address them.



Indeed, that is what the law requires from the planning process and actually prevents projects that do not come from the planning process from going forward.[2]

This Goals and Objectives Statement is a first step in the development of this project's Purpose and Need Statement. It begins the process of gathering information to evaluate the need for the I-11 and Intermountain West Corridor that will be shared with agencies and other stakeholders participating in the study. The intent of the Goals and Objectives Statement for this study is to provide a big-picture explanation of the potential benefits of the I-11 and Intermountain West Corridor, particularly the segments in Arizona and Nevada. The input received from project stakeholders on the Goals and Objectives Statement will be used in the development of project's

[1] http://www.environment.fhwa.dot.gov/strmlng/newsletters/apr07nl.asp

[2] http://www.fhwa.dot.gov/hep/guidance/plannepalegal050222.cfm

Purpose and Need Statement as the study progresses. As each segment of the I-11 and Intermountain West Corridor moves from the planning stage to the NEPA phase, a separate Purpose and Need Statement will be developed that focuses on the unique transportation deficiencies in that segment that must be addressed.

The information in this Goals and Objectives Statement was obtained largely from the I-11 and Intermountain West Draft Corridor Study *Corridor Justification Report* (June 2013). The Draft *Corridor Justification Report* is available at http://i11study.com.

Study Area

Although the ultimate vision for the I-11 and Intermountain West Corridor is to link Mexico and Canada, ADOT and NDOT are evaluating and establishing feasible routes and transportation connections for the priority sections of the corridor from Phoenix and Las Vegas, with options for extensions to the north (to Canada) and south (to Mexico). Because of its length and varying characteristics, the study area is divided into the following five segments with three segments that will undergo detailed corridor planning, and two segments (north of the Las Vegas and south of Phoenix metropolitan areas) that will be evaluated using higher-level visioning for potential extensions (Figure 1):

- Southern Arizona Future Connectivity Segment: Mexico to Casa Grande
- Priority Corridor Section: Phoenix Metropolitan Area (Casa Grande to Wickenburg)
- Priority Corridor Section: Northern Arizona/Southern Nevada (Wickenburg to Las Vegas Metropolitan Area)
- Priority Corridor Section: Las Vegas Metropolitan Area
- Northern Nevada Future Connectivity Segment: Beyond Las Vegas Metropolitan Area

ADOT and NDOT will identify a single alignment between Phoenix and Las Vegas. The alignment will be a wide corridor that will be further refined in future phases. The study team will also conduct a higher-level corridor development process to identify potential corridor extension(s) north of Las Vegas and south of Phoenix metropolitan areas. At this planning phase, it is not a requirement to identify precise study termini or to prove that the termini are logical. That examination will take place segment by segment (or project by project), as parts of the I-11 and Intermountain West Corridor will be further examined during future NEPA phases.

Corridor-wide Goals and Objectives

This section discusses a range of factors relevant to the study area that describe state and federal actions that speak to the need for the I-11 and Intermountain West Corridor, as well as transportation problems the corridor has the potential to address. The factors, which are summarized in the bullet points below, are commonly used in FHWA environmental documents. More information can be found in FHWA's Technical Advisory T 6640.8A (*Guidance For Preparing and Processing Environmental and Section 4(f) Documents*). As the Purpose and Need Statement for this study is developed, the factors discussed below may be modified.

- **Legislation –** Is there a federal, state, or local governmental mandates for the action?
- **System Linkage –** Is the proposed project a "connecting link?" How does it fit in the transportation system?
- **Trade Corridor -** How will the proposed facility enhance the efficient movement of freight in the study corridor?
- **Modal Interrelationships –** How will the proposed facility interface with and serve to complement airports, rail and port facilities, mass transit services, etc.?
- **Capacity –** Is the capacity of the present facility inadequate for the present traffic? Projected traffic? What capacity is needed? What is the level(s) of service for existing and proposed facilities?
- **Economics –** Projected economic development/land use changes indicating the need to improve or add to the highway capacity

- **Project Status—**Project history, including actions taken to date, other agencies and governmental units involved, action spending, schedules, etc.

The goal of the proposed action is to establish a high-capacity, limited-access, transportation corridor connecting Mexican ports and manufacturing areas with Arizona's and Nevada's largest regional, national and international manufacturing and economic activity centers to support regional, national and international trade. For Arizona and Nevada, the goal of the proposed action is to assist in diversifying the states' economies to target industry clusters that rely heavily on interconnected and efficient transportation systems to transport goods and facilitate business attraction/retention. The need for the proposed action is based on a combination of factors that include legislation, system linkage, trade corridor, modal interrelationships, capacity/congestion, economics, and project status/public policy. The remainder of this document discusses those factors. Together, the goals and objectives shape the range of corridor alignments developed and evaluated for the project.

Legislation

As noted, various states in the Intermountain West and the federal government have a long history of activities working toward a Mexico-Canada transportation corridor. In the 1995 National Highway Systems Designation Act, Congress defined the CANAMEX Trade Corridor as High Priority Corridor 26 in the National Highway System (NHS) from Nogales, to Las Vegas, to Salt Lake City, to Idaho Falls, to Montana, to the Canadian border. High priority corridors are Congressionally-identified corridors of national significance that are eligible for special discretionary funding from the National Corridor Planning and Development program. The High Priority Corridor designation in the NHS recognizes the importance of the corridor to the nation's economy, defense, and mobility. The CANAMEX Corridor uses Interstate and state highway corridors and generally follows I-19 from Nogales to Tucson, I-10 from Tucson to Phoenix, US 93 from near Phoenix to Las Vegas, and I-15 from Las Vegas through Utah and Montana to the Canadian border. This is not a continuous route because of a gap in designation between I-10 and US 93 in the Phoenix area.

The CANAMEX Corridor Coalition is a group of public and private sector representatives selected by the five governors with the intention of strategically investing in infrastructure and technology to increase competitiveness in global trade, create jobs, and maximize economic potential in the five-state region. Subsequent to Congress' selection of the CANAMEX Trade Corridor as High Priority Corridor 26 in 1995, the current federal surface transportation law, Moving Ahead for Progress in the 21st Century (MAP-21), identified part of the CANAMEX Trade Corridor, the US 93 corridor between Wickenburg, Arizona, and Las Vegas, as an NHS High Priority Corridor designated as future Interstate Highway I-11 (Figure 2) (FHWA 2012). The I-11 designation not only recognizes the economic importance of a more efficient Las Vegas-Phoenix connection to the Southwest's economy, but also it reaffirms the importance to the national economy of the larger CANAMEX Trade Corridor, of which the US 93 corridor is a part. Although US 93 extends from just outside Phoenix to Montana, converting the Phoenix to Las Vegas segment to an Interstate would create a more regionally and nationally recognizable connection between those cities. The "Interstate brand" would enhance the ability of US 93 (the future I-11) to support and expand business and tourism in both states and increase its importance as a segment of the I-11 and Intermountain West Corridor route serving regional and national freight and tourism. While the conversion of US 93 to I-11 would require a separate NEPA action, the fact that the federal transportation law has selected US 93 as an Interstate candidate is recognition of the importance of this one key segment of the I-11 and Intermountain West Corridor to the entire corridor.

It should also be noted that Nevada also has High Priority Corridor 19 connecting Reno to Canada via US 395, and High Priority Corridor 68, the Washoe County corridor that connects Reno and Las Vegas using US 95/I-580. Another High Priority Corridor that could be important to this study is Corridor 43 which includes US 95 from the Idaho/Oregon state border to Canada.

System Linkage

By creating a continuous north-south transportation corridor between Mexico and Canada that intersects the existing network of east-west Interstates in Arizona and Nevada, the priority segments of the I-11 and Intermountain West Corridor would provide important connections in the regional transportation system. South

of Las Vegas, the proposed improvements would provide the missing link between Phoenix and Las Vegas. In Arizona, the proposed corridor would fill in the missing connection between I-10 and US 93, and in Nevada it would complete the planned Boulder City Bypass to provide a limited-access connection to Las Vegas. The new link between Phoenix and Las Vegas would address a major, longstanding deficit in the region's passenger and freight transportation network, allowing Phoenix and Las Vegas to emerge as major logistics centers in the Southwest. This region has weak ground-based transportation connectivity. There is no direct rail service between the two metropolitan areas, and minimal intercity bus service. Providing a safe and efficient connection between Phoenix and Las Vegas has the ability to prolong the need for additional airport expansions in Arizona and Nevada. More than 2.5 million air passengers traveled between Arizona and Nevada in 2011. The Phoenix to Las Vegas air corridor (256 miles) is ranked in the top 100 most traveled air corridors in the nation (Brookings Institution 2009). Many of the more than 2.5 million air passengers that traveled between Arizona and Nevada in 2011 might have used alternative modes of transportation if reliable and safe options existed.

Beyond its ability to strengthen ground-based transportation, the priority segments of the I-11 and Intermountain West Corridor could enhance the economies of Phoenix, Las Vegas and the region by also transporting electricity, fuel, water, commodities (via pipeline) and telecommunication data.

By improving the connection between Phoenix and Las Vegas, which would intersect I-8, I-10, I-40, and I-15 connecting Southern California, Arizona and Nevada, a critical leg of the I-11 and Intermountain West Corridor would be established, as would the missing third leg of what is known as the Southwest Triangle Megaregion (Figure 3). The emerging Southwest Triangle with a population approaching 30 million consists of three main centers of growth:

- Southern California, with more than 20 million residents from San Diego to Santa Barbara
- Arizona's Sun Corridor, which is comprised of the Phoenix, Tucson, Prescott, and Nogales metropolitan areas, with nearly 6 million people
- The Greater Mojave Region centered on Las Vegas with about 2.2 million people

Of the Sun Corridor's four metropolitan areas that extend into Mexico, the Phoenix metropolitan area (population 4,192,887) and the Tucson metropolitan area (population 980,263) are the centers of population. The Sun Corridor is one of the fastest growing in the country and is forecast to double in population by 2040. Completing the missing Phoenix-Las Vegas leg of the Southwest Triangle would strengthen the economic interdependencies the major regions in the Southwest Triangle share in sectors such as logistics, healthcare, entertainment, tourism, and technology. Las Vegas and the Sun Corridor are also actively engaged in wind and solar research and development, equipment manufacturing, and green energy production.

The I-11 and Intermountain West corridor would also provide connectivity to rural areas in both Arizona and Nevada, linking them to economic anchors, providing access to more jobs and needed services, and creating economic opportunities. Demands for freight mobility in rural communities are met by highway, rail, and air transportation, or a combination of these modes. This places a great premium on an efficient regional transportation system with a high level of intermodal connectivity.

North of Las Vegas, the proposed project would facilitate the connections envisioned in the CANAMEX Trade Corridor linking Nevada with other Intermountain West states and ultimately connecting to Canada. More information about the linkages created by the priority segments of the I-11 and Intermountain West Corridor is found in the section below.

Trade Corridor

Along with enhancing the mobility of people, enhancing mobility of freight in the region is an important benefit of the I-11 and Intermountain West Corridor. Arizona and Nevada have similar freight flow characteristics:

- Inbound freight is dominated by domestic freight, and a notable percentage of the domestic freight in both states is from California. Specifically, 90 percent of inbound freight to Arizona and 95 percent of inbound

freight to Nevada is domestic freight. In Arizona, 30 percent of domestic inbound freight is from California, while 40 percent of domestic inbound freight to Nevada is from California.

- In each state, there is a strong flow of outbound freight to California. Seventeen percent of total outflows by value from Arizona are destined for California, while 30 percent of total Nevada outflows are bound for California.
- Import freight (by value) is primarily from Mexico and Canada and transferred from California. In Arizona for the import freight, slightly more than 50 percent of imports by value were from Mexico, about 9 percent were from Canada, and slightly more than 20 percent of imported goods were transferred from California. In Nevada, about 40 percent of imported freight by value was from Mexico and Canada.
- Both states are expected to be net importers in the future. In Arizona, inbound freight was about 30 percent more than outbound freight by total value which reflects Arizona's continuing status as a net importer. Like Arizona, but even more pronounced, Nevada is a net importer, with its inbound freight almost doubling the outbound freight by total value.

Given Arizona's and Nevada's strong freight flows to California, Mexico and Canada, the I-11 and Intermountain West Corridor, which would complete the missing leg of the Southwest Triangle, is expected to increase the efficiency of freight movement to and from both states and to enhance the region's economy.

Moreover, development of the I-11 and Intermountain West Corridor positions Arizona and Nevada strategically to benefit from the growing land and water port activity in the region. As transportation costs continue to rise and firms increasingly value the speed to which they can deliver goods to the consumer market, the trend of near-shoring manufacturing facilities to Mexico can be expected to continue. Currently, the largest land ports of entry with Mexico are located in California and Texas, and those ports are well-connected to the National Highway System. However, these routes are growing increasingly congested, particularly in California as the Ports of Los Angeles and Long Beach handle the bulk of freight flows from East Asia which utilize portions of the same network as northbound flows from Mexico. Specifically, the major trade corridors I-5 and I-10 have grown more congested and less efficient, which will stimulate demand for additional north-south routes like the I-11 and Intermountain West Corridor to accommodate trade flows.

A reliable infrastructure investment in the Intermountain West has the potential to attract north-south freight flows both from California and Texas. These freight flows create a crossroad of opportunities for the region's economies, as the freight flows increase demand for commercial activity centers, distribution and logistics centers, and inland ports and reloading facilities.

Modal Interrelationships

The priority segments of the I-11 and Intermountain West Corridor have established multimodal connections and a commitment from Arizona and Nevada, at the planning level, to continue promoting multimodal opportunities in the study area. A small sample of multimodal connections in the study area includes:

- The BNSF Railroad has a north-south branch line that connects one of their major east-west lines in northern Arizona to the Mobest Yard, Glendale Intermodal Facility, and other transloading (rail-to-truck) facilities.
- Tucson, with its connections to I-10 and I-8, is an inland port rail facility that is also a foreign trade zone bonded warehouse district that serves NAFTA and CANAMEX Corridor markets. The UPRR operates a north-south branch route from Tucson to Nogales, the Nogales Branch, which connects to Ferrocarril Mexicano (Ferromex) in Mexico, heavily used for accessing numerous auto assembly plants and industries in Hermosillo, Mexico.
- Nevada has two freight intermodal facilities where trailer on flat car or container on flat car can be transferred between railcars and/or trucks, the UPRR Sparks Intermodal Facility in northern Nevada and the UPRR Las Vegas Intermodal Facility.

- Arizona and Nevada have airports with cargo facilities that are considered inland ports of entry. Complete customs services allow foreign goods to clear customs. These air cargo facilities have positioned Phoenix Sky Harbor and Las Vegas McCarran airports as major West Coast air-truck distribution centers.

Examples of transportation planning studies that have set the stage for development of a multimodal I-11 and Intermountain West Corridor include:

- **Statewide Transportation Plans.** bqAZ established the 40-year multimodal transportation vision for the State of Arizona. Connecting Nevada is setting the same type of vision for Nevada. Both states include the proposed Phoenix-Las Vegas corridor as a critical element of their transportation systems and both envision the corridor to include multimodal facilities.
- **State Rail Plans in Nevada and Arizona** recommend similar outcomes, including passenger rail systems that offer a reliable alternative to automobile and air travel, as well as economically competitive freight transportation that accommodates interstate and intrastate shipping modes, helping to relieve highway congestion and improve traveler safety.
- **Passenger Rail.** ADOT is planning for intercity/commuter passenger rail service between Phoenix and Tucson. The XpressWest (formerly known as the DesertXpress) is a planned high-speed rail connection between the Las Vegas and Los Angeles metropolitan areas. The Federal Railroad Administration is completing the Southwest Rail Study to establish a near-term vision for higher-speed passenger rail in the Southwest. A passenger rail connection between Las Vegas and Phoenix is a key recommendation under study.
- **International Border Crossings.** ADOT is completing the Arizona-Sonora Border Master Plan, recommending transportation solutions to increase border crossing efficiency and safety. This will be done in coordination with the federal governments of the U.S. and Mexico, which are determining a logical location for a future freight rail crossing between Baja California and the Southwest U.S.

The proposed north-south transportation corridor connecting Mexico, Phoenix and Las Vegas would enhance highway connections with ports, rail intermodal facilities, and the region's airports. Possibly the most notable intermodal improvement that could result from the proposed improvements between Phoenix and Las Vegas would be the region's ability to efficiently accommodate freight from the Ports of Los Angeles and Long Beach by rail and/or highway. As noted, the improved Phoenix-Las Vegas corridor, with its connections to I-8 and I-10, would provide the missing leg for the Southwest Triangle connecting the I-11 and Intermountain West Corridor with Southern California. The Southwest Triangle is on a trajectory to be the only American region that maintains links to the world's fastest emerging economies in Asia (through the Ports of Los Angeles and Long Beach) and Latin America (through Arizona's connection to Mexico). International trade through Los Angeles and Long Beach is the largest in the country, with the Port of Long Beach alone handling more than $140 billion worth of goods each year (POLB 2013). Most goods from the Ports of Los Angeles and Long Beach destined for cities to the north and east are shipped on congested California freeways, including I-5. Shifting trade trends from Asia to Latin America may increase demand for corridors like the I-11 and Intermountain West Corridor that not only have the ability to provide efficient north-south freight movement, but also provide connections to east-west Interstates serving markets east of the Intermountain West. The West, in general, and the Southwest Triangle are underserved by efficient north-south capacity.

About half of the bilateral trade flows by value and volume through Arizona's border crossings with Mexico were multimodal, and by 2040, imports from Mexico through Arizona are expected to more than double to more than 13.4 million tons (FHWA 2012). In spite of that, the lack of connections and transportation infrastructure linking Mexico, Phoenix and Las Vegas and the Southwest Triangle, in general, make freight flows from and to Latin American/Mexico more attractive through Texas border crossings than through Arizona border crossings such as Nogales. Texas trade with Mexico is roughly 10 times greater than that between Arizona and Mexico. Less than 10 percent of land freight between the U.S. and Mexico flowed through Arizona, and approximately 90 percent of goods that flowed through Arizona crossed at Nogales. Providing an alternate north-south connection in the western U.S. is crucial to ensure timely, efficient, and competitive trade. The I-11 and Intermountain West

Corridor provides an opportunity to fill this transportation gap in terms of efficient high-speed, domestic north-south travel. It would also provide multimodal linkages between existing and future foreign ports and critical east-west, high-speed transportation corridors in the U.S., the junctions of which can provide significant regional economic development opportunities.

Capacity/Congestion

As noted in the *Corridor Justification Report*, congestion has impacts on commuters and truckers, affecting businesses, suppliers, manufacturers, and the overall economy. If congestion affects truck productivity and delivery times, costs are passed on to consumers, affecting areas far from the region where the congestion occurs. Congestion can result in unreliable trip times and missed deliveries. If the infrastructure supporting freight traffic is reliable, manufacturing and retail firms can carry fewer inventories because they can rely on goods being delivered on time.

In 2012, the U.S. Conference of Mayors published a report on the outlook of U.S. metropolitan economies and the critical role of transportation infrastructure. The metropolitan areas of Las Vegas and Phoenix rank in the top 50 cities for congestion costs per auto commuter, with Las Vegas ranked 41st and Phoenix 16th. In 2010, the annual congestion cost per auto commuter was $532 in Las Vegas and $821 in Phoenix. Focusing on specific congestion locations, five locations in Arizona and Nevada appear in FHWA's annual report on congestion at freight-significant highway locations. The majority of locations currently monitored are urban Interstate interchanges, and they are ranked according to congestion's impact on freight (American Transportation Research Institute 2011):

- I-15 at I-515 in Las Vegas
- I-10 at I-19 in Tucson
- I-10 at SR 51/SR 202 in Phoenix
- I-17 at I-40 in Flagstaff
- I-80 at US 395 in Reno

Currently, there is congestion through the project area's urban areas (Tucson, Phoenix, Las Vegas, and Reno) and the segment of US 93 near Wickenburg is approaching capacity. Figure 4 shows existing congestion on the major highways in Arizona and Nevada.

While existing highly congested areas in the Arizona and Nevada study area tend to be found along segments of urban Interstates and associated interchanges, traffic modeling suggests that, without improvements such as the I-11 and Intermountain West Corridor, higher congestion levels would also be experienced on rural highway segments. As part of the *Corridor Justification Report*, the project team went beyond the traditional comparison of existing roadway capacity to future traffic volumes in determining congestion levels. The project team evaluated potential congestion levels in the project area associated with three trade/economic scenarios. These scenarios are based on important current trends that, should they continue, will alter the needs for transportation, levels of trade, and overall development in the region. Each scenario was defined by comparison to a baseline scenario, which assumes that trade and freight flows, both international and domestic, grow as forecast by the USDOT. To assess the impact of each trade scenario on regional highway congestion, truck traffic volumes for each scenario were compared to the forecast values for the Baseline Scenario. For each route considered, the baseline traffic volumes were determined by:

- Adding the change in average annual daily traffic for the scenario using the scenario population growth rate
- Computing the scenario truck volume increment by using the scenario percentage increase of truck origins or destinations in the study area
- Adding the scenario truck volume increment to the baseline value on each segment evaluated.

This analysis provided an estimated average annual daily traffic volume for each scenario for each roadway segment analyzed. Then, the level of service (LOS) was determined using the thresholds for rural routes. LOS, which is a measure of a highway's ability to handle traffic demand, is influenced by factors such as average daily traffic volumes, truck percentages and number of driving lanes. LOS ranges from "A" to "F" in order of decreasing operational quality. The percentage of these segments demonstrating congestion (LOS D to F) was then determined. The baseline and three trade scenarios are described below.

- **Baseline Scenario** reflects a continuation of recent background growth in the region and of current trends, without major structural changes. It is presented as the highly probable economic future of the region, in the absence of significant changes from the recent past. It assumes that transport and trade continue as forecast. This includes international trade forecasts, continuation of the trends in balance of trade, continuation of the distribution of trade between major trading partners, and continuation of existing trade route distribution.
- **Growth in Asia-Pacific Trade Scenario** is based on the continued growth of the trade flows with Asia that have characterized West Coast trade during recent decades. This scenario is predicated on the continued growth in U.S. imports of a wide array of low-cost consumer goods from China and other low-cost Asian sources. It assumes that trends in manufacturing in the Asia-Pacific region continue and that the U.S. continues to receive a growing volume of goods from Asia.
- **Expanded Trade with Mexico Scenario** assumes that Asia-Pacific manufacturing for the U.S. market flattens, and that significant production growth occurs in Mexico. The trend of moving manufactured goods production to Mexico, much previously done in Asia, is known as nearshoring. Since the enactment of NAFTA, bilateral trade between Mexico and the U.S. has grown exponentially.
- **Fully Realized State Economic Development Plans Scenario** assumes that Arizona and Nevada are able to realize their major economic development goals, including growing their economies through an industry cluster-based strategy and increasing trade with Mexico and Canada.

Each scenario could make a major contribution to the economic well-being of the region's residents, bringing up to 500,000 people and 240,000 employees to the region. Table 1 summarizes the modeled increases in economic output, population, employment, and congested highways.

TABLE 1
Key Modeled Results Corresponding to Each Trade Scenario

Scenario	Economic Output ($ billions)	Population Increase (high range)	Employment Increase (high range)	Unacceptably Congested Highways (%)
Baseline	911	15,078,114 (base)	6,934,707 (base)	28 (base)
Growth in Asia-Pacific Trade	924 to 937	320,574 (2.1%)	147,342 (2.1%)	34
Expanded Trade with Mexico	928 to 953	521,435 (3.5%)	239,464 (3.5%)	Up to 43
Fully Realized State Economic Development Plans	919 to 927	186,587 (1.2%)	85,700 (1.2%)	34

The range of current and anticipated trends in U.S. trade, together with the natural geographic advantages of the Intermountain West region, suggests that under the entire range of alternative trade scenarios considered, the region will experience significant sustained growth in the regional economy, accompanied by corresponding growth in travel demand. The level of highway congestion associated with some of these economic futures suggests that additional investment in transportation infrastructure is likely required to realize the full extent of these benefits. The percentage of unacceptably congested highways ranges from 28 percent with the Baseline Scenario to up to 43 percent with the Expanded Trade with Mexico Scenario (Figure 5). Note that in each trade scenario, California's

primary north-south route, I-5, and the primary connection to Nevada, I-15, are highly congested. By strategically enhancing regional transportation infrastructure, particularly efficient north-south routes, the I-11 and Intermountain West Corridor, with its connections to east-west Interstates in Arizona, Nevada and throughout the Intermountain West, has the opportunity to attract freight shipments from less efficient travel corridors and experience economic growth, particularly at the transportation hubs that develop around the intersection of the north-south and east-west routes.

Economics

The population growth of the Intermountain West states—particularly Arizona and Nevada—is outpacing growth of the U.S. and the capacity of the regional transportation network. In addition, regional economic development trends are creating demands for new transportation links. Between 2000 and 2010, the rate of growth for the Intermountain West states was 19.6 percent—double that of the U.S. as a whole, which grew at a rate of 9.8 percent. According to the U.S. Census Bureau, between 2010 and 2030, the Intermountain West is projected to grow by 28.5 percent, to 32.1 million people, which exceeds the forecasted U.S. growth rate of 17.7 percent over the same time frame. By the middle of the century, the Intermountain West's population is expected to nearly double from 22 million to 40 million (Arizona Republic, 2010). Of the Intermountain West states, the highest growth rate is expected in Arizona. In the next 30 years, the Conference of Mayors projects that the Phoenix metropolitan area will see the greatest proportionate population growth in the country – with an anticipated 88 percent increase from 2012 to 2042. Las Vegas also ranks high, with a 67 percent increase expected (IHS Global Insight 2012).

Economic growth is strongly and positively correlated with overall transportation demand, both for freight and personal vehicles. Development trends in Arizona and Nevada indicate that the economies of both states are expected to continue to outpace the U.S. average. Gross domestic product (GDP) is a principal indicator of the health of an economy or industry. GDP measures the value of final goods and services produced during a given period. According to the U.S. Bureau of Economic Analysis, the GDP for Arizona is $258.4 million and for Nevada is $130.3 million. The Phoenix ($194.7 million) and Las Vegas ($92.7 million) metropolitan areas are the largest contributors to each state's economy, followed by Tucson and Reno. An Interstate highway (I-10) connects Tucson and Phoenix, yet there is not a continuous high-speed limited access corridor between Phoenix and Las Vegas.

Fifty-one percent of employees in Nevada and 43 percent of employees in Arizona work in industries that depend on a reliable regional transportation network for transporting goods and tourists. While manufacturing jobs represent only 5.0 percent of all jobs in Arizona and 2.8 percent of all jobs in Nevada, the growth of manufacturing in both states exceeded the U.S. GDP of 1.5 percent, with Arizona at 8.9 percent and Nevada at 3.7 percent. When examining employment projections by industry, Arizona is expected to see gains in transportation and logistics, manufacturing, healthcare, and professional services. Likewise, Nevada is projecting job growth in mining, transportation and logistics, and manufacturing—most of which rely on an efficient regional transportation network.

To enhance the region's competitiveness, a robust transportation system is needed to facilitate the growth of business and its attraction to the area and to offer a means to connect to other markets. Industry targets such as aerospace, aviation, and defense; advanced manufacturing; mining, materials, and manufacturing; transportation and logistics; and tourism, gaming, and entertainment are critically dependent upon their supply chain and the regional movement of people and finished goods. Both states recognize that to be successful in their economic development endeavors, many simultaneous strategies−including developing the transportation systems that these industry clusters require−must be implemented.

Project Status/Public Policy

From the CANAMEX Trade Corridor designation in the 1990s through ADOT's current capacity expansion project on US 93 between I-40/US 93 Interchange in Flagstaff and Vista Royale in Wickenburg, numerous studies and construction projects have furthered the development of the I-11 and Intermountain West Corridor. Critical to the creation of the priority segments of the I-11 and Intermountain West Corridor has been Nevada's and Arizona's cooperation since the early 1990s, planning for improved access from Las Vegas south to Phoenix and a potential

northern extension to Reno, creating a better connected Intermountain West with greater economic opportunities. Listed below are brief descriptions of key ADOT and NDOT activities that will lead to a limited access, 4-lane divided roadway between Phoenix and Las Vegas. Appendix A (Past Planning Studies and Strategies) of the May 2013 *Corridor Justification Report* lists the full range of construction projects, multi-state planning studies and statewide planning studies conducted in Arizona and Nevada that have a connection to the I-11 and Intermountain West Corridor. The entire Draft *Corridor Justification Report* is attached as an appendix to this document.

Contributing Arizona Improvements

ADOT has invested nearly $500,000,000 to upgrade the US 93 corridor to a 4-lane divided highway, seeking to expand the 200-mile stretch between Wickenburg and the Hoover Dam to a safer and more efficient facility for commercial trucks and passenger vehicles. The segment between the Mike O'Callaghan–Pat Tillman Memorial Bridge and I-40 is complete, as are many segment improvements south of I-40. Only 5 highway improvement projects remain, leaving about 45 miles of highway to be widened to at least 4 lanes.

In Arizona's most recent update of the *Long Range Transportation Plan* (2011), the Hassayampa Freeway, from I-10 to US 93, is designated as an "example of a significant transportation infrastructure project," a facility that could qualify as a new roadway under the recommended funding scheme. Completion of the Hassayampa Freeway would close the I-10 to US 93 gap in the CANAMEX Trade Corridor, creating a continuous route.

Several ideas have been advanced for a southern extension to Mexico, including using the I-10 and I-19 corridors, although many capacity and environmental constraints are present in the Tucson metropolitan area and near the Arizona-Sonora border. Passenger rail and freight rail have been recommended as components of the new corridor, either within the same right-of-way, closely parallel, or diverging to connect to alternate destinations (for example, rail and highway may cross the international border at different locations).

Additionally, the *Arizona-Sonora Border Master Plan*, led by ADOT and in coordination with the Arizona-Mexico Commission, is studying the border transportation network to improve connectivity and efficiency.

Contributing Nevada Improvements

NDOT is continuing the Connecting Nevada process, a statewide, long-range transportation plan that will guide Nevada's transportation investments for the next 40 years and establish policies for preserving transportation corridors. This effort initiated multimodal transportation discussions among stakeholders and could be the catalyst to unite I-15, I-80, and the proposed I-11 into one transportation triangle serving the state.

NDOT recently completed a multi-state planning effort for the I-15 corridor. The *I-15 Corridor System Master Plan* defines a long-range, multimodal transportation system vision, governance, and implementation strategy, and provides a prioritized program of projects needed to serve all modes of transportation. Defining that vision involved a unique regional partnership among government and private interests in Nevada, California, Arizona, and Utah–the I-15 Mobility Alliance.

NDOT and ADOT worked together to construct the Hoover Dam Bypass and to conduct US 93 corridor improvements on both sides of the bridge. When the Mike O'Callaghan–Pat Tillman Memorial Bridge opened to traffic in late 2010, it attracted many vehicles that had previously avoided, or had been prohibited from, crossing over the Hoover Dam. This resulted in significant congestion through Boulder City, especially on weekends when tourist travel to Las Vegas peaks. NDOT fast-tracked the design and construction of a project to widen US 93 to 2 lanes in each direction, including some operational and safety improvements, between the bridge and Boulder City. The ultimate solution in this area is a new alignment around Boulder City (referred to as the Boulder City Bypass), connecting US 95 to the Hoover Dam Bypass. The Boulder City Bypass Phases 1 and 2 (Figure 6) are two segments of a future 4-lane limited access freeway that will reduce traffic congestion along US 93 and intersecting streets in Boulder City, Nevada.

Phase 1 is roughly 3 miles long and will extend from I-515 at Foothills Drive to US 95. Phase 1 is being developed by the NDOT. Phase 2 is roughly 12 miles long and will extend from US 95 to the recently completed Nevada Interchange at SR 172 (the road to Hoover Dam). Phase 2 is being developed by the RTC.

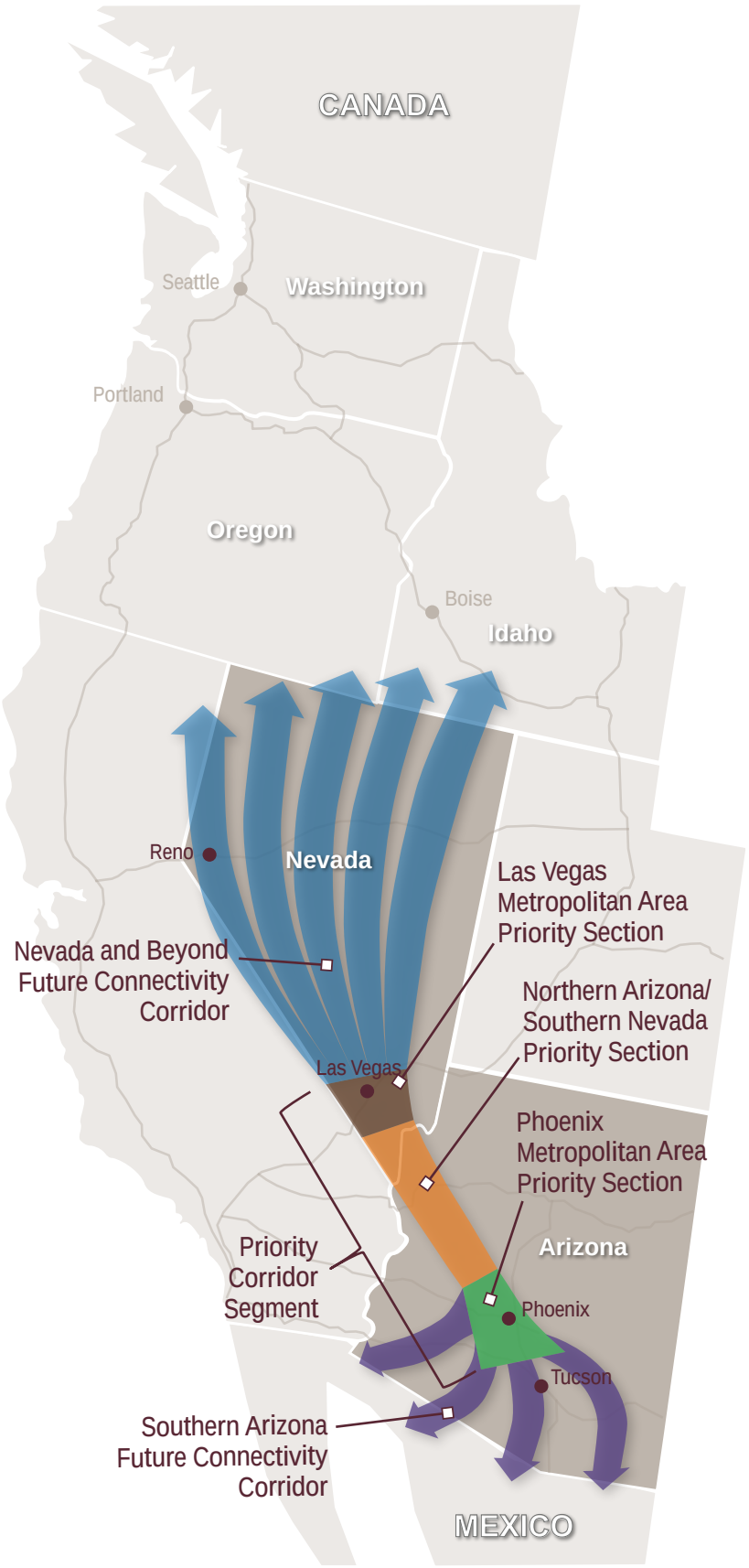


Figure 1
Study Area Segments

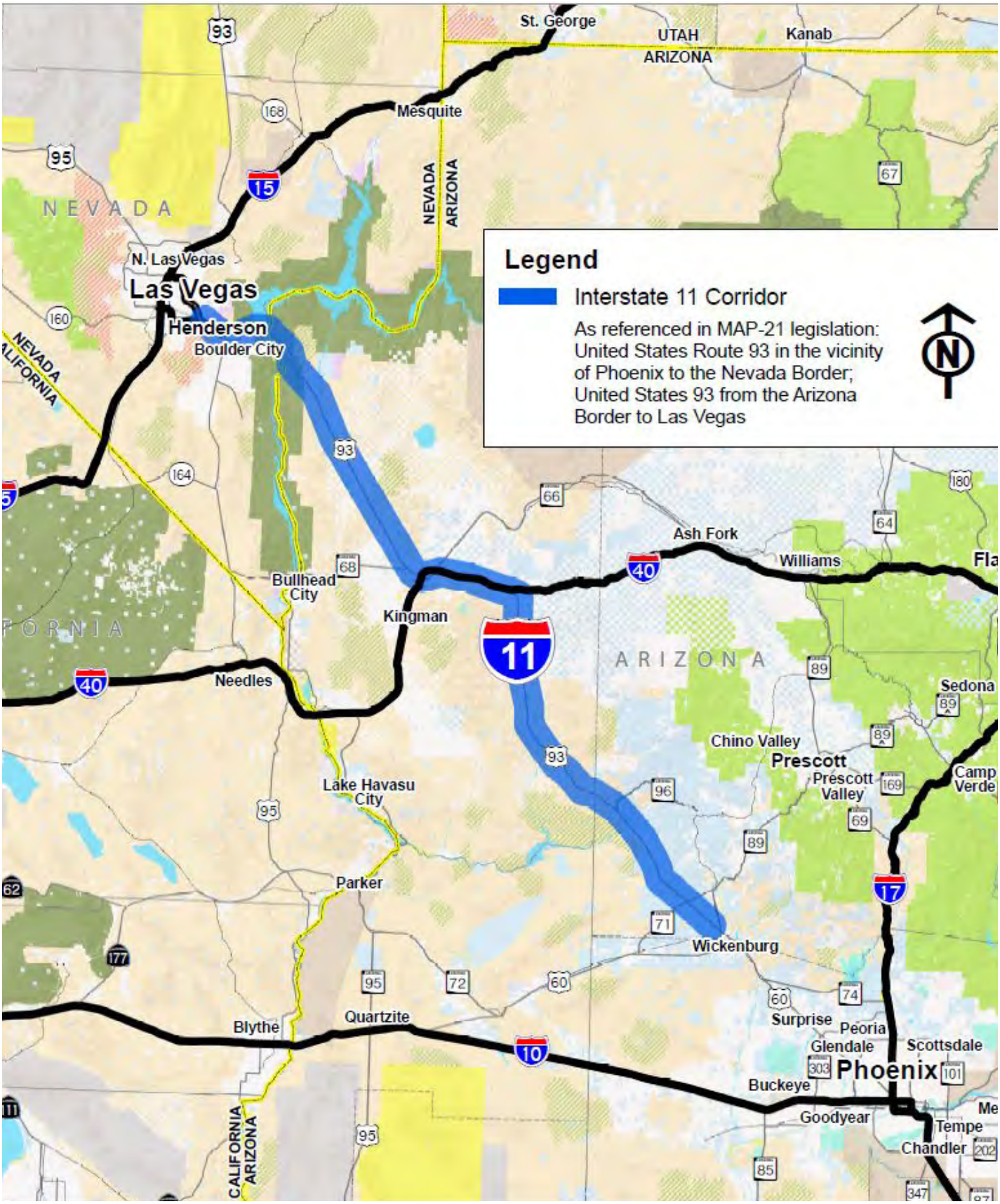


Figure 2
I-11 Corridor as Identified in MAP-21 Legislation

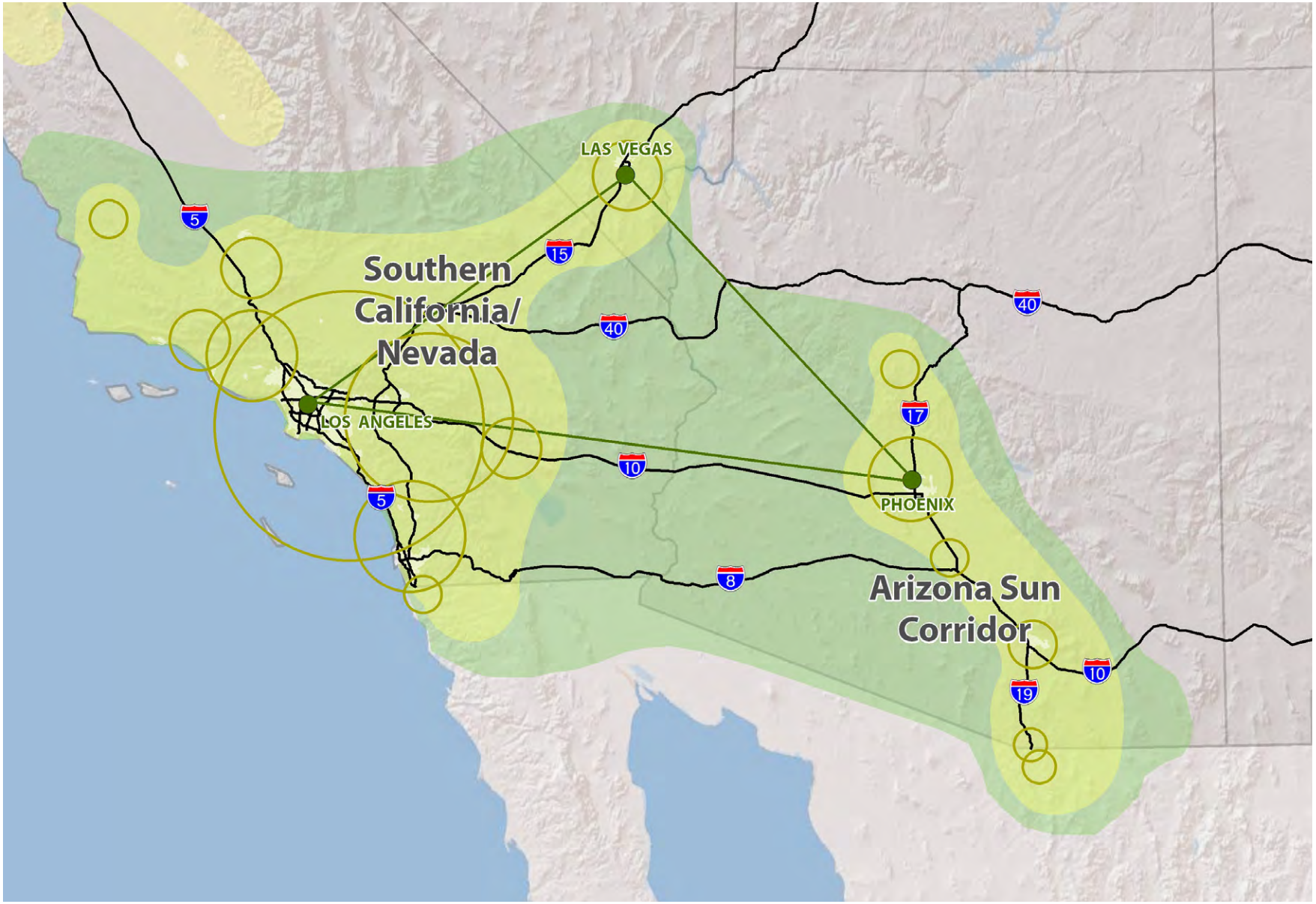


Figure 3
The Southwest Triangle: Expanding Megapolitans

Legend

- State Boundary
- Interstate/Expressway
- State/US Highway

Level of Service

- LOS C or better
- LOS D
- LOS E
- LOS F

Notes:

1. LOS in rural areas is based on Generalized Annual Average Daily Volumes from Florida's 2012 FDOT Quality/Level of Service Handbook Tables
2. Existing LOS shown for urbanized areas are estimated using existing traffic counts and existing number of thru lanes
3. Future LOS shown for urbanized areas are from 2030 Nevada Statewide Travel Demand Model and MAG Projections
4. LOS for US 395 corridor, from SR 178 to California/Nevada State Line and California/Nevada State Line to California/Oregon State Line are based on estimated AADT that are based on future growth of affected counties
5. Future LOS in rural areas is based on existing capacity and future traffic projections
6. State/US highways are only illustrated for those showing LOS

Figure 4
Existing Congestion on Major Highways in Arizona and Nevada

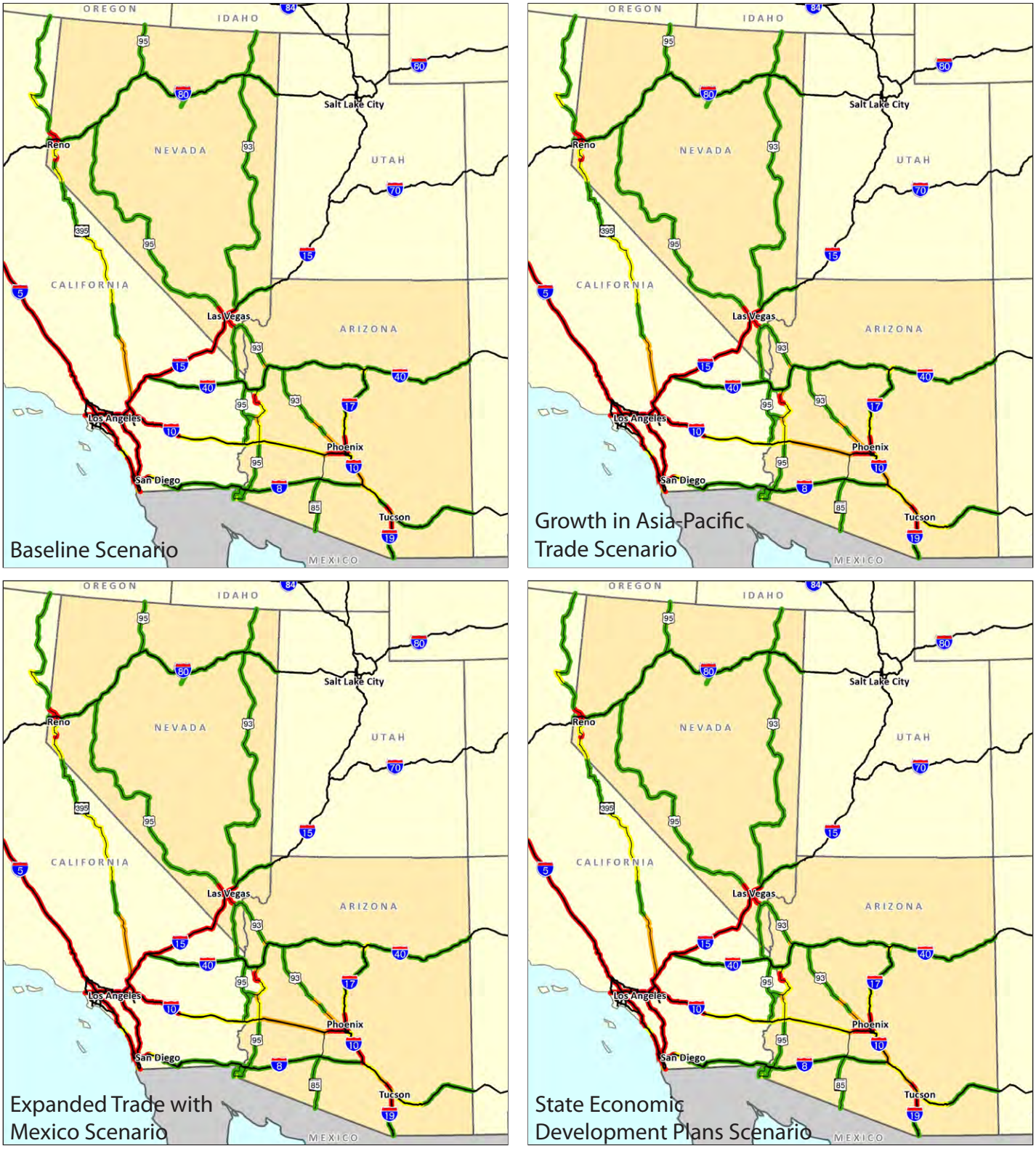
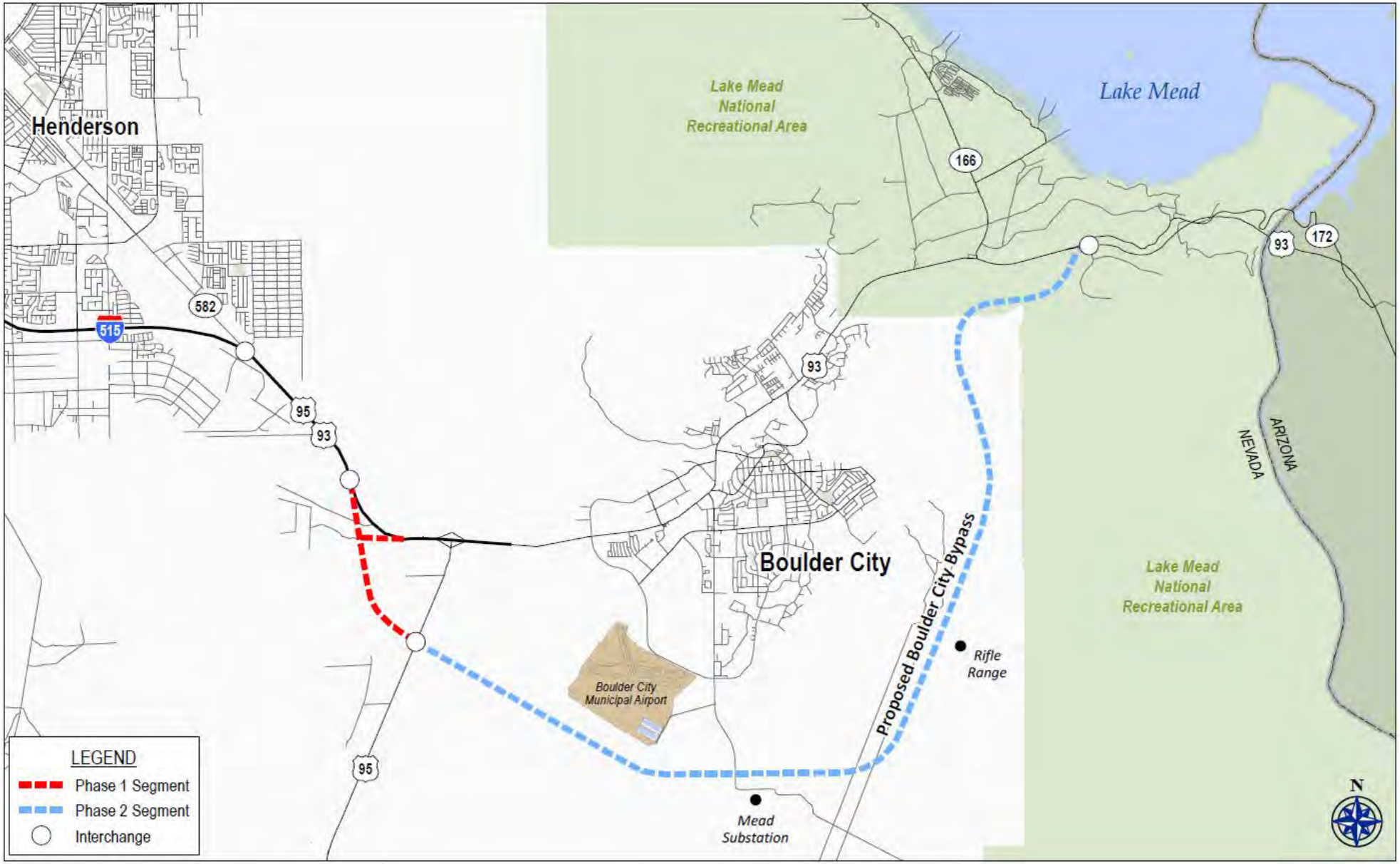


Figure 5
Regional Highway Congestion Levels With Four Trade Scenarios



Source: RTC of Southern Nevada, Boulder City Bypass Sketch Level Traffic and Revenue Study, CDM Smith, November 2012

Figure 6
Boulder City Bypass Phases 1 and 2

Appendix B
White Pine County Comment Letter

The White Pine County Board of County Commission have reviewed the proposed I-11 Intermountain West Corridor project and acknowledges our Congress has recognized the importance of the portion of the Corridor between Phoenix and Las Vegas and designated it as future I-11 in the recent transportation authorization bill, Moving Ahead for Progress in the 21st Century Act (MAP-21).

Developing a new north-south trade corridor through Nevada and Arizona could supplement the existing system and relieve freight congestion on I-5, one of only two (including I-15) continuous north-south Mexico-to-Canada interstate routes west of Texas. In reviewing the different alternatives for routing beyond Las Vegas, our Commission would like to bring to your attention important data collected by our staff.

The three alternative routes being reviewed for Nevada's link from Las Vegas to Canada are as followed.

Leaving Las Vegas per US-95 to Fallon, then into Reno, Nevada, up US-395 into California and terminating on I-5 at Eugene, Oregon: This route encompasses **(872) miles** of roadway that will need to address **(142) obstacles** that will need attention; i.e. bridges, railroad and highway crossing, per under and overpasses, narrow Right of Ways through townships, culverts, etc. In addition, the Las Vegas I-215 Beltway along the northern region of Las Vegas will need to be reconstructed to remove all traffic lights currently in place.

Leaving Las Vegas per US-95 to Fallon, continuing up US-95 to I-80 into Winnemucca, then into Oregon per US-20, terminating onto I-5 at Portland, Oregon: This route encompasses **(1,018) miles** of roadway that will need to address **(31) obstacles just in Nevada alone,** that will need attention; i.e. bridges, railroad and highway crossing, per under and overpasses, narrow Right of Ways through townships, culverts, etc. In addition, the Las Vegas I-215 Beltway along the northern region of Las Vegas will need to be reconstructed to remove all traffic lights currently in place.

Leaving Las Vegas per US-93, traveling north onto US-318 through Hiko and Lund, then onto US-6 for a short trip back onto US-93 north through Ely, continuing to Wells, Nevada and terminating on I-84 in Twin Falls, Idaho: This route encompasses **(535) miles** of roadway that will need to address **(41) obstacles along its entire length** that will need attention; i.e. bridges, railroad and highway crossing, per under and overpasses, narrow Right of Ways through townships, culverts, etc. In addition, the Las Vegas I-215 Beltway along the northern region of Las Vegas will not be utilized and therefore, will not need reconstruction costs allocated.

Our Commission supports the Alternative Route QQ along the eastern region of Las Vegas but only if it terminates at I-15 North and continues north per Alternative AA as previously removed from consideration. Utilizing US-93 not only saves construction costs per lane per mile at $5M average times four lanes equaling $20M per interstate roadway mile, it provides the least amount of private and tribal land interference, requiring land acquition dollars.

When comparing the alternative through Reno, Nevada to Eugene, Oregon as compared to Twin falls, Idaho, there is a difference of (337) roadway miles. Based at an assumption of an average cost at $20M per mile per a (4) lane interstate, the project could incur an additional **$6.74B US Dollars plus the costs to address a difference of (101) obstacles**, i.e. railroad and highway under and overpass, culverts, and large traffic bridge reconstruction projects, etc.

Based on economic drivers, the intent of this initiative was to include an upgraded highway, but could be paired with rail and other major infrastructure components—such as energy and telecommunications—to serve the nation's needs in the West. White Pine County currently has the only major wind farm in Nevada, with the potential to utilize biomass, hydro and solar for future energy projects on the horizon. Oil and Gas exploration is an industrial cluster developing in White Pine County with over 1.5M acres of public lands currently leased for exploration; more than most counties in the US. And finally, the linear mileage for rail improvements along US-93 compared to US-95 are less than half of the linear miles.

Secondly, US-93 provides two access points into Canada, not just one as per the Reno – Eugene connection. US-93 enters into Twin Falls, Idaho per I-84, which extends west into Portland, Oregon then up into Vancouver, Canada. Per conversations with ODOT, the highway is under capacity and may be able to support additional traffic per I-11 commuters. If you go east on I-84 from Twin Falls, you will join I-87, which connects to I-15 from Salt Lake City, Utah and then proceeds north into Calgary, Canada. This preferred route would allow economic benefits to Nevada, Oregon, Idaho, and Montana, states with much needed boost to their economy.

Its no doubt Eastern Nevada is on the forefront of new energy development and will continue to provide a strong tax base for the State of Nevada with its Mining, Oil and Gas, and Renewable Energy Industries. Please consider the data provided to reconsider US-93 as a viable player for the most effective cost estimates to not only utilize Nevada for a section of I-11 Intermountain West Corridor, but to support the initiative to see the interstate help extend traffic flows into Canada per two destination points, Vancouver and Calgary.