



FINAL DRAFT

Corridor Concept Report

# I-11 and Intermountain West Corridor Study

AUGUST 2014



LINKING ECONOMIES • GENERATING PROSPERITY



“The I-11 corridor remains a crucial infrastructure project that will serve transportation, economic development, and commerce needs in Southern Nevada. The completion of this interstate freeway will attract trade and economic activity to Southern Nevada and provide much needed construction jobs. This project is critical to the future of our state and has my full support.”

Brian Sandoval, Nevada Governor, March 21, 2014 – at Future I-11 Sign Unveiling Ceremony



“For Arizona to remain globally competitive, it is imperative that we continue to seek and develop opportunities like I-11. In addition to serving as the first direct interstate through Phoenix and Las Vegas, and eventually the first Mexico-to-Canada corridor, this project will pay dividends in trade and tourism for our region and nation for generations to come.”

Jan Brewer, Arizona Governor, March 21, 2014– at Future I-11 Sign Unveiling Ceremony

## ACKNOWLEDGMENTS

The I-11 and Intermountain West Corridor Concept Report and associated reports are products of the commitment of each of the I-11 Core Agency Partners, Stakeholder Partners, and their dedicated staff. Their efforts are a testament to the outstanding partnership and a true spirit of collaboration, without which this Corridor Concept Report would not have been possible.

## CORE AGENCY PARTNERS AND STAKEHOLDER PARTNERS

The I-11 and Intermountain West Corridor Study is a high priority for the Nevada and Arizona Departments of Transportation (NDOT and ADOT), which have pooled their resources and are jointly managing this study. The metropolitan planning organizations in the greater Las Vegas and Phoenix areas (Regional Transportation Commission of Southern Nevada and Maricopa Association of Governments), the Federal Highway Administration (FHWA), and the Federal Railroad Administration (FRA) are actively involved in the study, and together with the sponsoring agencies of NDOT and ADOT, form the Core Agency Partners.

Interested public agencies, non-profit organizations, and private interest groups participated in a Stakeholder Partners group, providing data and other input, and sharing their opinions and ideas on decision points throughout the process.

## CONSULTANT SUPPORT

ADOT and NDOT would like to recognize the efforts of the I-11 and Intermountain West Corridor Team in providing invaluable data, resources, and assistance in capturing, analyzing, and summarizing the planning recommendations into this Corridor Concept Report. The consultant team members and their specific roles in this project include:

**CH2M HILL** – Prime consultant, responsible for overall project management, stakeholder and public outreach, partner agency coordination, and technical studies including the Corridor Vision Summary, Corridor Justification Report, Alternatives Development and Evaluation, Feasibility Reports, Implementation Program, Business Case, Planning and Environmental Linkages checklists, and Corridor Concept Report

**AECOM** – Strategic planning and significant contributions to the technical studies including the Corridor Vision Summary, Corridor Justification Report, Alternatives Development and Evaluation, Feasibility Reports, Implementation Program, Business Case, Planning and Environmental Linkages checklists, and Corridor Concept Report, as well as prime partner for agency, stakeholder, and public outreach

**HDR, Inc.** – Travel demand modeling, economic analysis and other technical support and contributions to the Corridor Justification Report, Alternatives Development and Evaluation, and Business Case

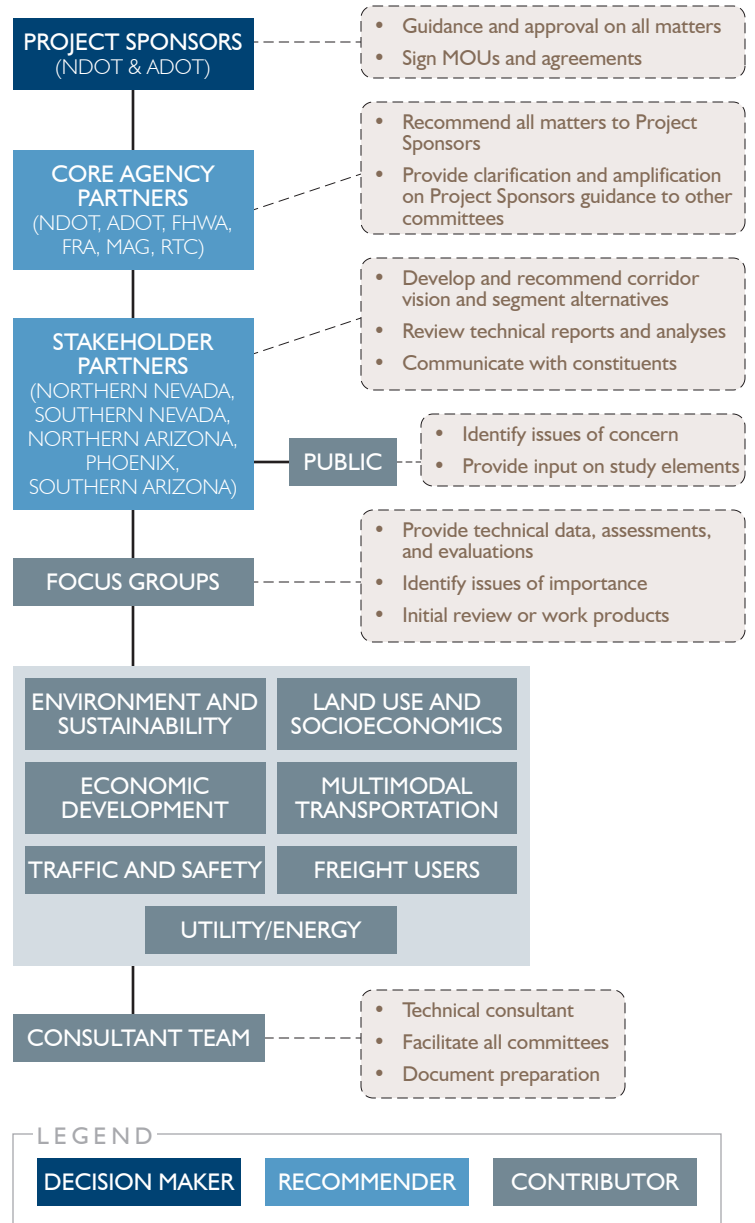
**ESI Corporation** – Economic analysis and contributions to the Corridor Justification Report and Business Case

**Partners for Strategic Action, Inc.** – Comprehensive facilitation, coordination, and documentation of the overall stakeholder and public outreach program, including partner agency, Tribal community, interest group, and public communications

**RGC Economics, LLC** – Research in support of the Business Case

**Brookings Mountain West** – Overall guidance on corridor justification and socioeconomics

**Policy in Motion** – Technical support to the alternatives analysis process



# INTRODUCTION

## What is the purpose of the I-11 and Intermountain West Corridor Concept Report?

The purpose of the I-11 and Intermountain West Corridor Study is to determine whether sufficient justification exists for a new high capacity, multimodal transportation corridor, and if so, to establish and characterize the likely routes.

The many technical documents produced throughout the Study are summarized in this Corridor Concept Report—establishing the corridor vision, developing justification, and defining an implementation program to move the project forward. The I-11 and Intermountain West Corridor Study delivers the following:

### **Phase I. Preliminary Corridor Vision**

– established the basis and vision for the project.

### **Phase II. Corridor Justification Report**

– provided justification for the corridor and the foundation for how this corridor can improve economic prosperity.

### **Phase III. Corridor Concept Development**

– developed and evaluated corridor alternatives, the business case, and implementation requirements.

All supporting technical documents are available at [www.il11study.com](http://www.il11study.com).

Each of this Report's four chapters demonstrates the need for such a corridor in the Intermountain West:



**Chapter 1: Connecting Borders Globalizes the Intermountain West** – provides an overview of the need for a high-capacity, north-south, multimodal corridor to link economies and connect international borders in the Intermountain West.



**Chapter 2: Linking Economies** – identifies the range of corridors that link major metropolitan areas and connect communities, strengthening their economies and providing prosperity for their citizens.



**Chapter 3: Generating Prosperity** – presents the economic value of the corridor by identifying opportunities for economic growth in both established and new sectors of the region's economy.



**Chapter 4: Next Steps** – emphasizes the need for continued collaboration between current and new partner agencies at the federal, state, and local levels, as well as in the non-governmental and private sectors to successfully move the I-11 and Intermountain West Corridor forward.



## CORRIDOR VISION

Serving the nation's north-south, multimodal transportation needs from Mexico to Canada, the I-11 and Intermountain West Corridor will provide a vital multimodal connection between the Arizona Sun Corridor and Las Vegas. It is also envisioned to promote freight linkages between the new and expanding ports in Mexico and Canada, existing U.S. West Coast ports, and future inland ports and commerce centers crucial to distributing goods across North America. These linkages will stimulate the development of new crossroads, spurring community and economic development opportunities spanning the entire corridor. Effective inclusion of multimodal infrastructure elements, such as natural resources, power, telecommunication, freight rail, and potentially passenger rail, serve as the foundation of a stronger and more diversified economy for the Western U.S. The I-11 and Intermountain West Corridor will become a major, multimodal, north-south, transcontinental corridor through the Intermountain West.



# 1 CONNECTING BORDERS

PAGE 6



# 2 LINKING ECONOMIES

PAGE 14

# GENERATING PROSPERITY

PAGE 22

# 3



# NEXT STEPS

PAGE 32

# 4



# CONNECTING BORDERS

THE I-11 AND INTERMOUNTAIN WEST CORRIDOR SIGNIFIES A NEW NORTH-SOUTH, MULTIMODAL TRANSPORTATION CORRIDOR, LINKING ECONOMIES AND CONNECTING INTERNATIONAL BORDERS TO GLOBALIZE THE INTERMOUNTAIN WEST.





## HISTORY OF TRANSPORTATION SYSTEM INVESTMENTS

As Americans, we rely on the transportation network in our daily lives – it links communities and urban areas together and encourages cultural, social, and economic exchanges. As trade routes expand and technological advances continue to alter how we live our lives, our transportation infrastructure must evolve to play a larger role in enabling economic prosperity.

The I-11 and Intermountain West Corridor is intended to fill this high-capacity, north-south gap and serve as a transformational, multimodal infrastructure component that will change the economic future of the Intermountain West.

The I-11 and Intermountain West Corridor will play a vital role in connecting borders, linking economies, and generating prosperity.



“Our unity as a nation is sustained by free communication of thought and by easy transportation of people and goods. The ceaseless flow of information throughout the Republic is matched by individual and commercial movement over the vast system of inter-connected highways crisscrossing the Country and joining at our national borders with friendly neighbors to the north and south.”

Quote Source: Excerpt from President Dwight D. Eisenhower’s speech to U.S. Congress, February 22, 1955.

## 1860s: Transcontinental railroads establish the American West

Transcontinental railroads established cities, stimulated economies, and triggered an resurgence of tourism in the Intermountain West.

Connecting our nation's east-west borders dates back to the economic expansion during the Industrial Revolution, where railroads were built to

expedite the shipment of goods across a growing nation. The transcontinental railroad network developed in the early 1860s linked the East and West Coasts by

providing a more efficient and cost-effective mode of transportation, fostering the migration of people and commerce to the West.

## 1950s: Interstate Highway System spurs inter-regional access

Building upon the transcontinental railroad network, the Interstate Highway System, authorized by President Dwight D. Eisenhower in 1956, further evolved America's economy.

Mass production of the automobile and trucks in the 1920s provided an affordable means of transportation to a rapidly growing nation. Cold War concerns regarding national defense, coupled with the availability of automobiles to average American families inspired the development of the Interstate Highway System of the 1950s, which further connected metropolitan areas and created a population movement to the West at an unprecedented rate. In the

1960s, containers revolutionized the movement of goods by easily transporting commodities from ships to trains to trucks, anywhere in the world.

Early planning for the Interstate Highway System identified numerous routes; however, the original 41,000-mile system did not include a north-south interstate highway corridor between I-5 and I-15. At the time, the focus of interstate planners was to improve east-west connections to California.

Future projections indicate the Intermountain West will continue to see significant population and economic growth, prompting the need for better north-south transportation connections to accommodate travel demand and freight mobility.



### 1860s: Transcontinental railroad lines foster the migration of people and commerce to the West

The East and West Coasts of North America were linked by a railway network on May 10, 1869, by uniting the Union Pacific and Central Pacific Railroads. This 3,000-mile-long railroad enabled people and goods to travel from New York to California in days, instead of weeks or months.



1950 Population -  
Las Vegas/Clark County: 48,289  
Phoenix/Maricopa County: 331,770

1912 - Arizona achieves statehood

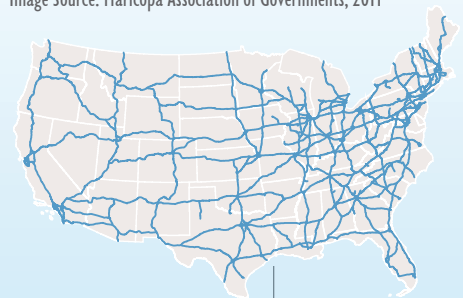
1864 - Nevada achieves statehood



### 1956: Federal-aid Authorization signed by President Dwight D. Eisenhower, establishes America's Interstate Highway System

Legend has it that the Interstate Highway System began with President Franklin D. Roosevelt, drawing three lines east and west and three lines north and south on a map of the United States and asking the Bureau of Public Roads to build it.

Quote Source: Origins of the Interstate, Lee Mertz  
Image Source: Maricopa Association of Governments, 2011



# 1990s: Congress designates High-Priority Corridors in the Intermountain West

With the success of the Interstate Highway System and to further enable infrastructure and economic growth, Congress designated several National Highway System High-Priority Corridors in the Intermountain West.

Over the past several decades, corridor concepts for a transportation network through the Intermountain West have been suggested and studied at various levels of detail. The 1991 Intermodal Surface Transportation Efficiency Act and 1995 National Highway Systems Designation Act identified a series of High-Priority Corridors for federal funding including the Canada, U.S., Mexico (CANAMEX) Trade Corridor. This designation recognizes the importance of the CANAMEX corridor to the U.S. economy, defense, and mobility.

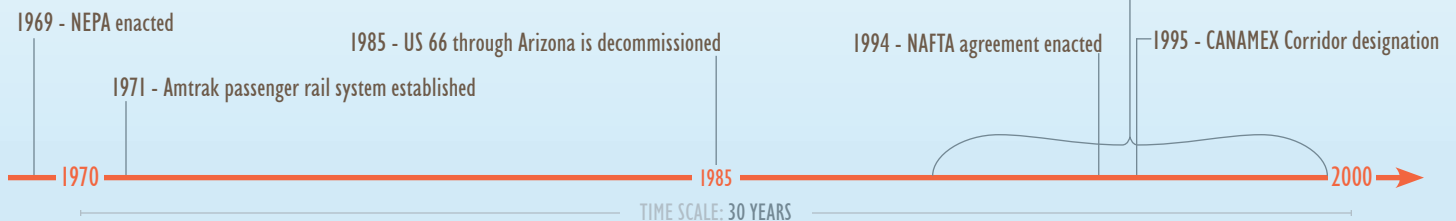
Since the North American Free Trade Agreement (NAFTA) was adopted in 1994, trade among the U.S., Canada, and Mexico has increased more than threefold and employment in North America has grown by nearly 40 million jobs. Mexico's trade with the U.S. has more than quadrupled and 82 percent of its exports go to the U.S.

With the lack of a north-south connection between NAFTA partners in the Intermountain West, the region has not taken full advantage of the range of trade and manufacturing opportunities that NAFTA has created.

**1990s: Congress designates High-Priority Corridors in the Intermountain West**  
The National Highway System High-Priority Corridor designation is an important step in identifying the need for efficient trade corridors.



— CANAMEX Corridor  
— Other Intermountain West High Priority Corridors



## 2010: Mike O’Callaghan-Pat Tillman Memorial Bridge opens

Both states have already implemented various planning, design, and construction projects for potential corridor components, with the most notable projects being the completion of the Mike O’Callaghan – Pat Tillman Memorial Bridge.

Arizona and Nevada have completed planning for a regional corridor with improved access between Las Vegas and Phoenix. Both states have already implemented various planning, design, and construction projects for potential corridor components, with the most

notable projects being the completion of the Mike O’Callaghan – Pat Tillman Memorial Bridge, the imminent construction of the Boulder City Bypass, and numerous 4-lane widening projects on US 93 between Wickenburg, Arizona, and Boulder City, Nevada.



2010: Mike O’Callaghan–Pat Tillman Memorial Bridge opens

### 2012: MAP-21 Corridor designation puts I-11 on the map

Funding surface transportation programs at more than \$105 billion for fiscal years 2013 and 2014, MAP-21 is the first long-term highway authorization enacted since 2005.



2013 Population -  
 Las Vegas/Clark County: 2,027,868  
 State of Nevada: 2,790,136  
 Phoenix/Maricopa County: 4,009,412  
 State of Arizona: 6,626,624

2006 - Phoenix becomes the nation’s fifth largest city

2007 - Great Recession begins



## 2012: New transportation legislation sets the stage for the I-11 and Intermountain West Corridor

The need for a new north-south transportation connection is so vital that Congress identified the US 93 Corridor between the Phoenix and Las Vegas metropolitan areas as Interstate 11.

For decades, the federal government has recognized the importance for a north-south transportation corridor through the Intermountain West. The recently enacted federal transportation legislation, Moving Ahead for Progress in the 21st Century (MAP-21), signed into

law on July 6, 2012, designates US 93 as future Interstate 11 between the Phoenix and Las Vegas metropolitan areas.

In approving the I-11 designation, Congress recognized the need for and importance of an interstate link between

the Phoenix and Las Vegas metropolitan areas. Although this designation does not guarantee funding, it elevates the importance of the proposed route, improving the chances for obtaining federal funds as the project warrants further consideration.

## I-11 AND INTERMOUNTAIN WEST CORRIDOR STUDY

Statewide planning efforts in Arizona and Nevada spur formal studies to complete the transportation gap in the West – the genesis for the I-11 and Intermountain West Corridor.

In 2012, ADOT and NDOT began the I-11 and Intermountain West Corridor Study, between the Sonoran Desert and Pacific Northwest, linking Mexico and Canada and providing a vital connection between the metropolitan areas of Phoenix and Las Vegas.

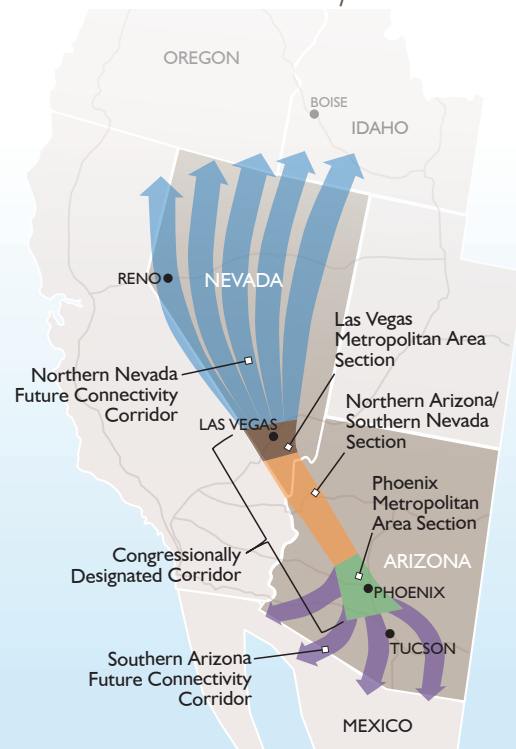
This study provides a high-level overview of the multimodal corridor opportunities, and is the foundation for subsequent detailed alignment and environmental studies. This study also provides an initial implementation program to expeditiously assemble an affordable interim corridor to serve as the I-11 and Intermountain West Corridor, fulfilling the NAFTA goal and better opening the Arizona and Nevada economies to international trade.

Because of the length and varying characteristics of the corridor, it has been divided into separate segments for detailed study (Figure 1). The Congressionally Designated Corridor includes three separate sections between

the Phoenix and Las Vegas metropolitan areas. The Southern Arizona and Northern Nevada Future Connectivity Corridors evaluated potential extensions beyond the Phoenix and Las Vegas metropolitan areas.

This corridor is intended to provide an opportunity for a multimodal corridor that could pair together highway, rail and other major infrastructure components, including power and energy; natural resources such as oil, natural gas, and water; and telecommunications.

Figure 1  
I-11 and Intermountain West Corridor Study Area



By 2020, the U.S. trucking industry will move 3 billion more tons of freight than it hauls today. To meet this demand, the industry will put another 1.8 million trucks on the road.

Source: AASHTO, Unlocking Freight, 2010

75%

The percent of U.S.-Mexico bilateral trade crossing through land ports of entry in 2011 was 75%

Source: Bureau of Transportation Statistics, Transborder Freight Data, 2012

13.4 m tons

Imports from Mexico through Arizona border crossings are expected to more than double by 2040 to 13.4 m tons

Source: FHWA, Freight Analysis Framework Version 3 (FAF3), 2012

18.6 m tons

Exports from Arizona to Mexico are expected to more than quadruple by 2040 to 18.6 m tons

Source: FHWA, Freight Analysis Framework Version 3 (FAF3), 2012

\$66.2 billion

Total value of exports from Arizona to Mexico by 2040 is estimated at \$66.2 billion

Source: FHWA, Freight Analysis Framework Version 3 (FAF3), 2012

## Land ports of entry are key to economic growth

Continued investments in land port of entries are key to mitigating congestion and encouraging the use of an I-11 and Intermountain West Corridor by making crossing times shorter and more predictable.

The function and capacity of Arizona's land ports of entry will affect the viability of the I-11 and Intermountain West Corridor. On its international border with Mexico, Arizona has eight land port of entries that provide controlled entry into or departure from the U.S. for people, raw materials, and goods. Only one of these land port of entries, DeConcini in Nogales, has a rail crossing for freight. Land port of entries are a key aspect of freight movement through the Intermountain West Corridor, with about 75 percent of U.S.-Mexico bilateral trade by value crossing through land ports in 2011.

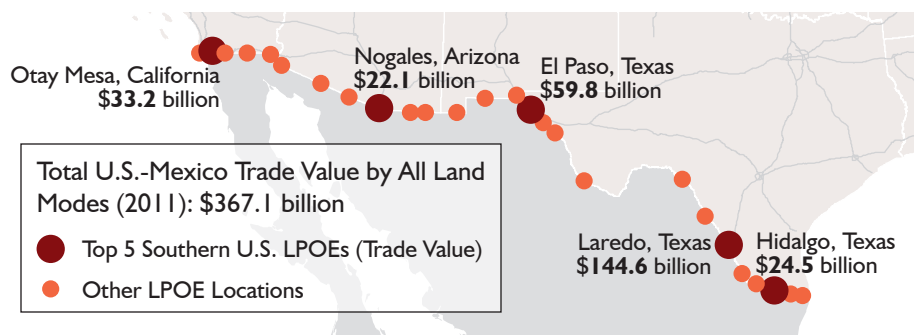
These border crossings are potential bottlenecks in the freight transportation network. As cargo levels continue to increase, the infrastructure supporting freight traffic will be strained and congestion will rise if no infrastructure investment is made. This will make the

functionality and efficiency of Arizona's ports and associated infrastructure all the more critical to ensure reliable delivery of goods and to support economic growth.

With ample capacity, limited congestion, and high-quality transportation links, the number of land port of entries and the quality of associated infrastructure in Texas have made Texas highways and railways attractive for accessing the American Heartland. The volume of freight crossing land ports of entry through Texas has undoubtedly been predominantly determined by the large populations in the Eastern Seaboard and Midwest, but would have been significantly less or would have shifted to other locations without the benefits of recent land port of entry investments and connected infrastructure in Texas.

Figure 2

The primary destinations and origins for imports and exports entering through Arizona land port of entries (LPOEs) in 2040 are projected to be Arizona, California, Texas, and Michigan.



## Additional trade corridors are needed to support water ports

New and expanded Mexican ports have the potential to serve as reliever ports for the congested Port of Los Angeles and Port of Long Beach, and could increase I-11 and Intermountain West Corridor demand, particularly if rail freight were offloaded to trucks.

Global factors such as booming growth in Pacific Rim countries, economies shifting toward exports, the overall pace of global economic growth, relative strength of U.S. manufacturing, and the impact of the Panama Canal improvements are affecting North American water ports. Trade corridors to and from the ports will need to evolve with changing port demand.

The Port of Los Angeles and Port of Long Beach in Southern California have long been the primary gateways of manufactured goods from the Asian markets. These entry points are typically the most cost-effective way to deliver goods to North American markets and their function and capacity have a significant impact on the direction and volume of freight flows in the Intermountain West. As two of the busiest ports in the U.S., increasing congestion on California's road and rail systems and the availability of an alternate north-south route will have the effect of shifting greater amounts of trade into the Intermountain West.

The Mexican Port of Guaymas, located on the Gulf of California, is a deep-water seaport and connects to the CANAMEX Corridor. The Port of Guaymas is poised to be an excellent opportunity to provide raw materials for an integrated manufacturing belt throughout Sonora, Arizona and Nevada. Guaymas is located on the Ferronex Rail System connected to the Union Pacific Railroad (UPRR) in Nogales, Arizona. This new connection

could increase the demand on the I-11 and Intermountain West Corridor.

The ports of Seattle, Tacoma, and Oakland could also benefit from development of an I-11 and Intermountain West Corridor by providing efficient north-south connections between major east-west corridors. The same is true for the Canadian ports of Vancouver and Prince Rupert, that have a geographically advantageous location with trade routes to Asian markets.

Providing a convenient, high-capacity, intermodal transportation link joining these West Coast ports will provide economic benefit unmatched in the history of the Intermountain West.

The continued functionality and efficiency of western U.S. ports and associated infrastructure will be critical to supporting international freight movement. As cargo levels continue to increase, the transportation infrastructure supporting freight traffic will be strained and congestion will intensify in the Intermountain West. The I-11 and Intermountain West Corridor will provide essential freight linkages between existing U.S. West Coast ports, new and expanding ports in Mexico and Canada, and future inland ports and commerce centers crucial to distributing commodities across North America. These linkages will promote community and economic development throughout the Intermountain West.

Figure 3

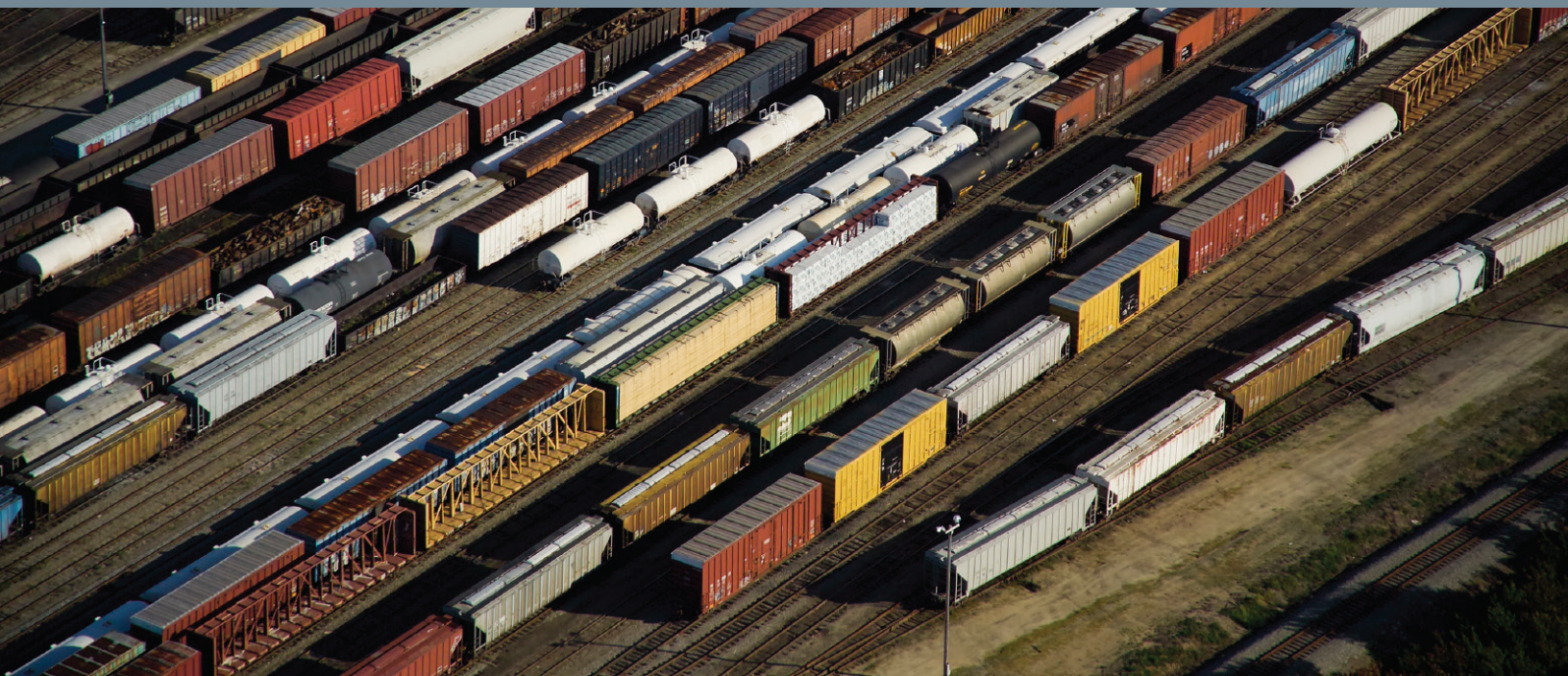
Deep-water seaports along the North American West Coast can benefit from development of an I-11 and Intermountain West Corridor by providing efficient north-south connections between major east-west corridors.





# LINKING ECONOMIES

THE I-11 AND INTERMOUNTAIN WEST CORRIDOR STUDY TAKES MEANINGFUL STEPS TOWARD THE ULTIMATE NORTH-SOUTH CORRIDOR SYSTEM VISION—LINKING COMMUNITIES, STRENGTHENING THEIR ECONOMIES, AND PROVIDING PROSPERITY FOR THEIR CITIZENS AND BUSINESSES.





## INTEGRATING MULTIMODAL TRANSPORTATION SYSTEMS TO STIMULATE ECONOMIC DEVELOPMENT

The I-11 and Intermountain West Corridor has the potential to structurally alter the way goods and people move throughout the region.

Economic development is entirely dependent upon the movement of goods and people. As a pillar of economic competitiveness, high-quality, multimodal infrastructure facilitates the growth of business and its attraction to an area, and offers the means to connect to other markets. Having an integrated system of roads, aviation, freight options, energy, and data transmission, has allowed the central and eastern areas of the U.S. to successfully link communities and employment centers, resulting in robust economic vitality and job creation. A new north-south transportation route in the Southwest provides a trade link to the nation's fastest growing region, the Intermountain West and offers similar economic and job growth potential.

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 in 2012, the GDP for Arizona is \$255.9 billion and for Nevada is \$129.4 billion (Figure 4). The Phoenix and Las Vegas metropolitan statistical areas are the largest contributors to the Arizona and Nevada economies, followed by Tucson and Reno. The I-11 and Intermountain West Corridor will connect these major economies of the Intermountain West, as well as more than 9 million people.

“Trade corridors are not a new phenomenon: they have been used for trade and transport for centuries. A trade and transport corridor is a coordinated bundle of transport and logistics infrastructure and services that facilitates trade and transport flows between major centers of economic activity.”

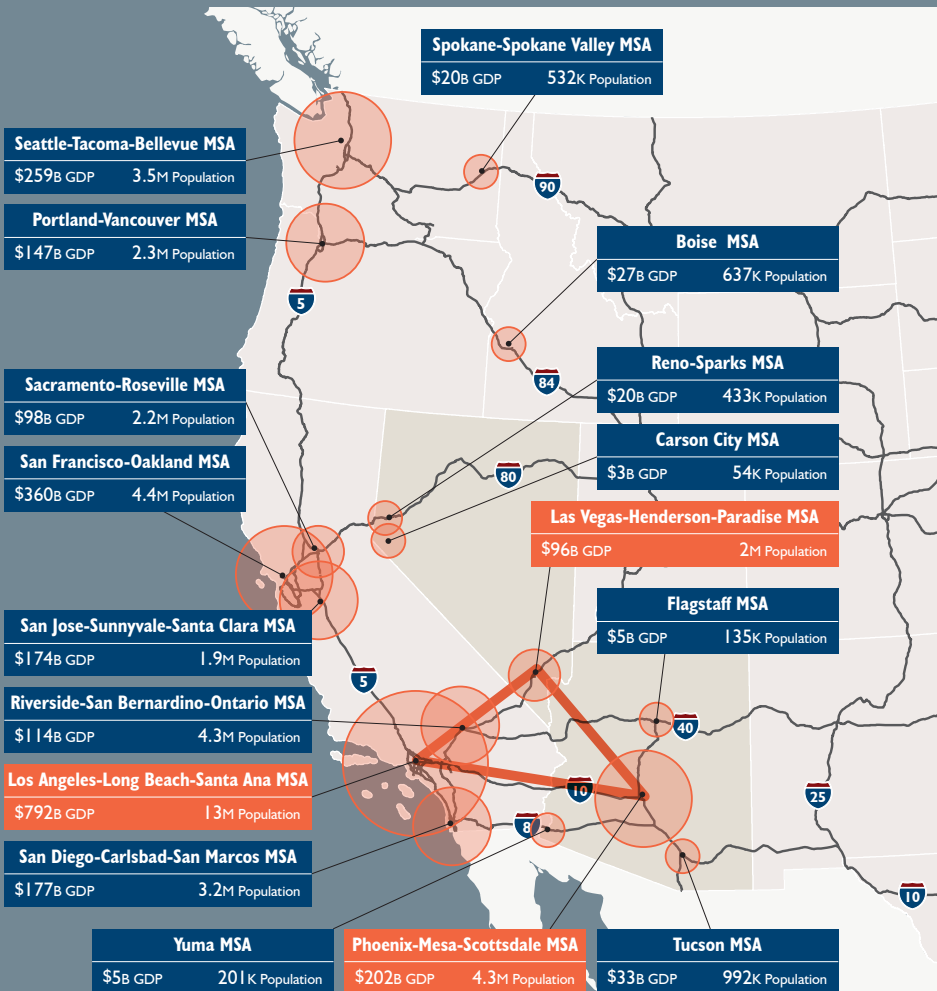
Quote Source: Trade and Transport Corridor Management Toolkit; Charles Kunaka, Robin Carruthers; The World Bank, 2014



What if the I-15 Corridor from San Diego to Utah was never built? The I-15 Corridor is a critical asset to the West by offering a tourism route from San Diego, to the resort corridor in Las Vegas, and beyond to the natural wonders of Utah, and by providing a multimodal transport route for \$120 billion of commerce annually, as well as \$52 billion in tourism revenue. The I-11 and Intermountain West Corridor is envisioned to serve a similar role by connecting borders to bring \$22 billion in increased economic output to the region, linking economies to connect 9 million people between the metropolitan areas of Phoenix and Las Vegas, and generating prosperity to provide 240,000 additional permanent jobs within the region.

Photo Source: I-15 Freeway Dedication, March 11, 1966; Nevada Department of Transportation

The I-11 and Intermountain West Corridor will link millions of people and connect major economies throughout the region.



**Figure 4**

Some of the largest economic and population centers in the U.S. will rely on the I-11 and Intermountain West Corridor to move people and goods throughout the region.

Footnote: A metropolitan statistical area (MSA) is defined as one or more adjacent counties that have at least one urban core area of at least 50,000 population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties.

Data Source: United States Census Bureau, Metropolitan and Micropolitan Statistical Areas, 2012; US Department of Commerce, Bureau of Economic Analysis

## Conceptualizing corridor alternatives that connect major centers of economic activity

Since the study area is so broad in nature, a corridor evaluation process with defined evaluation criteria (shown in Figure 5) was developed to identify, screen, and recommend corridor alternatives. The evaluation process took the full range of alternatives and evaluated them based on criteria in line with corridor goals and objectives.

Several corridor alternatives were identified and evaluated. An alternative corridor was defined as a planning-level corridor that could contain one or more modes such as highway, rail, and utilities, within one or more of the study area segments. Alternatives were evaluated based on a set of criteria, such as how well they connect major national and international activity centers from Mexico to Canada through the Intermountain West. Other important considerations for alternatives were their connections to major freight hubs and high-capacity transportation corridors and opportunities for intermodal connectivity, including airports and intermodal yards. The universe of alternatives and the evaluation process/criteria were developed in coordination with a large stakeholder network.

## Level I Corridor Screening Alternatives

The Level I analysis applied to the entire corridor, including the three Congressionally Designated Corridor Sections (comprised of the Phoenix Metropolitan Area Section, Northern Arizona/Southern Nevada Section, and the Las Vegas Metropolitan Area Section, as illustrated in Figure 1), as well as the Southern Arizona and Northern Nevada Future Connectivity Segments. The analysis applied a number of qualitative criteria to a comprehensive range of alternatives. The purpose of this first level was to assess whether alternative

corridors in each segment met the goals and objectives of the project.

Alternatives that did not meet the goals and objectives were not carried forward into the Level 2 evaluation. Although these corridors do not serve the transportation needs of the Intermountain West region, many of these alternative corridors are important to statewide transportation system connectivity.

## Level 2 Corridor Screening Alternatives

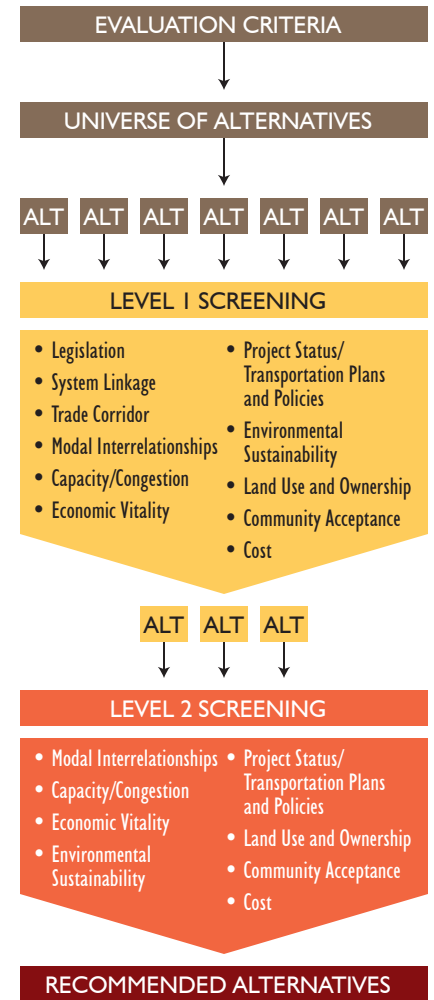
The Level 2 analysis further evaluated Congressionally Designated Corridor section alternatives that were shown in Level 1 to be reasonable and feasible and potentially beneficial to Arizona and

Nevada. The Level 2 evaluation criteria used many of the same categories as those used for the Level 1 screening. Figure 6 shows all alternatives evaluated and screened in this two-tiered process.

## Recommended Corridor Alternatives

This two-tiered evaluation process resulted in a series of corridor recommendations for the Congressionally Designated Corridor sections, as well as the Future Connectivity Segments, as shown in Figure 7. Resultant corridors are

considered reasonable and feasible, and these broad corridors are recommended to move forward into more detailed and environmental analyses for further refinement.

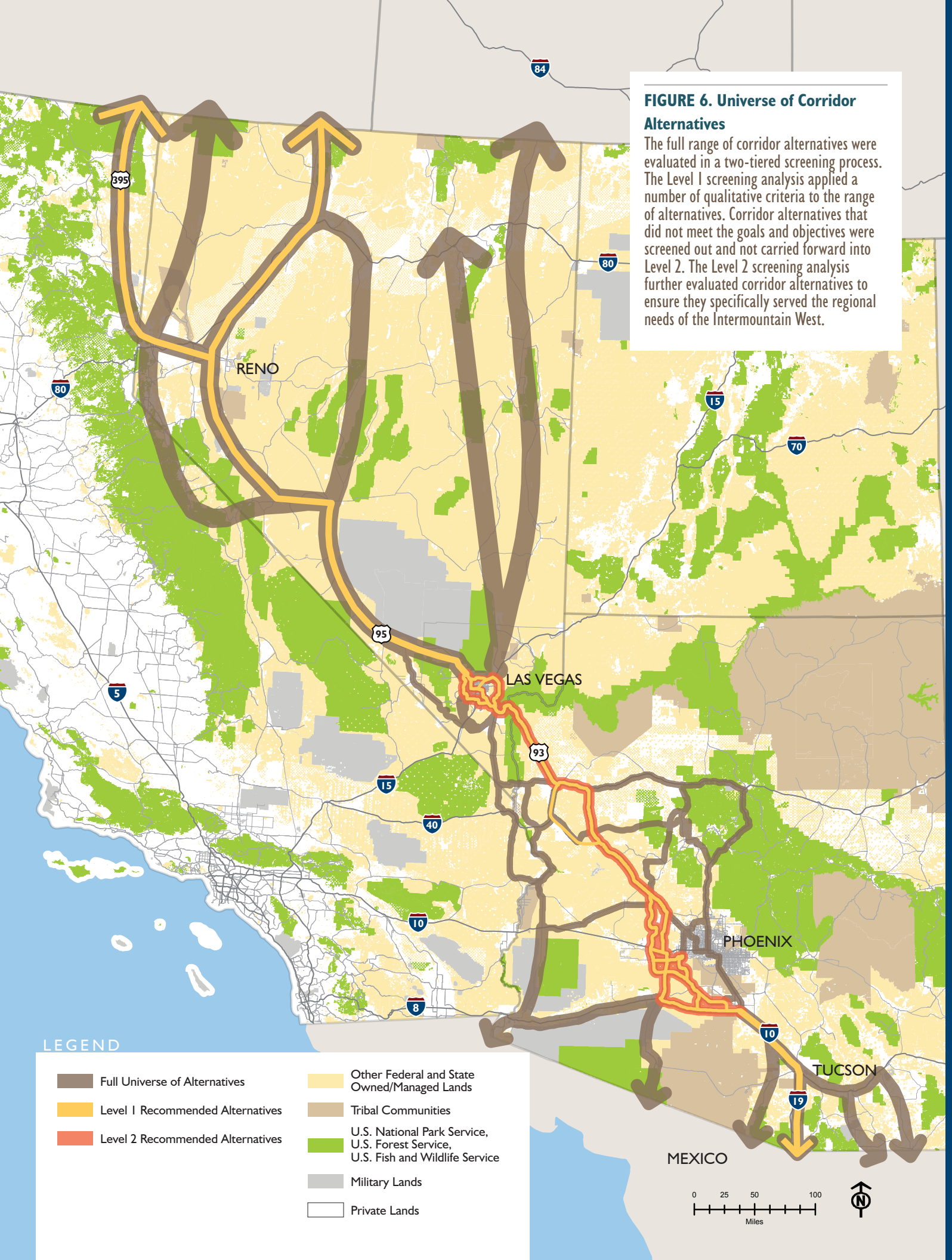


**Figure 5. Corridor Evaluation Process**

Defining evaluation criteria establishes a process to screen alternatives, and develop a list of recommended corridors for further consideration.

**FIGURE 6. Universe of Corridor Alternatives**

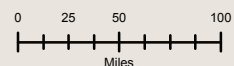
The full range of corridor alternatives were evaluated in a two-tiered screening process. The Level 1 screening analysis applied a number of qualitative criteria to the range of alternatives. Corridor alternatives that did not meet the goals and objectives were screened out and not carried forward into Level 2. The Level 2 screening analysis further evaluated corridor alternatives to ensure they specifically served the regional needs of the Intermountain West.



**LEGEND**

- |  |                                  |  |                                                                                       |
|--|----------------------------------|--|---------------------------------------------------------------------------------------|
|  | Full Universe of Alternatives    |  | Other Federal and State Owned/Managed Lands                                           |
|  | Level 1 Recommended Alternatives |  | Tribal Communities                                                                    |
|  | Level 2 Recommended Alternatives |  | U.S. National Park Service,<br>U.S. Forest Service,<br>U.S. Fish and Wildlife Service |
|  |                                  |  | Military Lands                                                                        |
|  |                                  |  | Private Lands                                                                         |

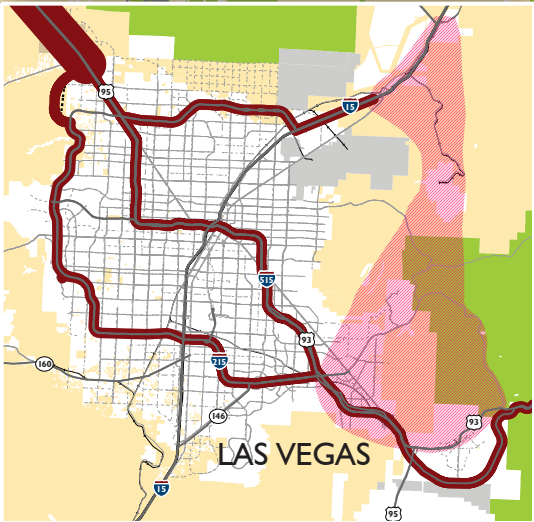
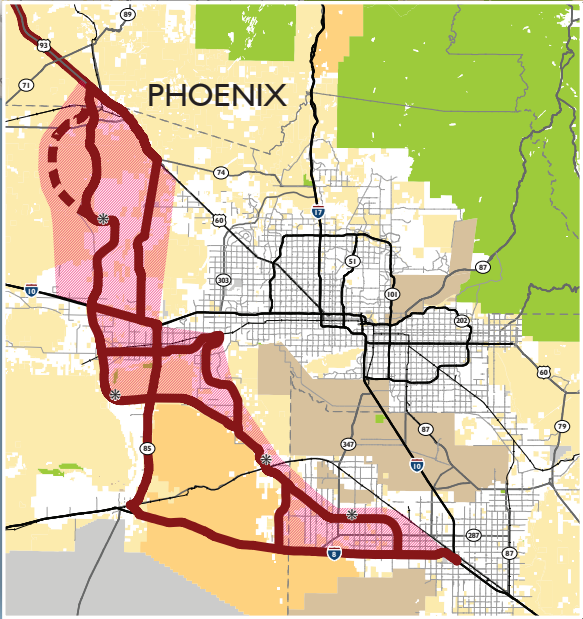
MEXICO



**FIGURE 7. Recommended Corridor Alternatives**

The two-tiered evaluation process used for the I-11 and Intermountain West Corridor Study resulted in a series of corridor recommendations for the Congressionally Designated Corridor sections, as well as the Future Connectivity Areas. Recommended corridors to move forward for more detailed planning and environmental analysis were deemed to be both reasonable and feasible based on the evaluation results. Future studies will determine specific alignments.

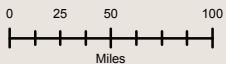
\* This corridor represents an illustrative transportation corridor that was accepted by the MAG Regional Council and is included in the MAG Regional Transportation Plan. This is one of numerous corridors that may be considered in subsequent environmental studies. A preferred corridor will not be recommended without review and approval of the FHWA under the provisions of the National Environmental Policy Act (NEPA).



**LEGEND**

- Recommended Corridor Connection
- Alternative Alignments May Vary within Shaded Area
- National Monument
- Private Lands
- Other Federal and State Owned/Managed Lands
- Tribal Communities
- U.S. National Park Service, U.S. Forest Service, U.S. Fish and Wildlife Service
- Military Lands

MEXICO





Nearly 3,000 people participated in public meetings and online virtual forums.

## Engaging the public ensures regional needs are met

Stakeholder participation and community engagement is critical to the alternatives development and screening process and is important in accurately reflecting regional and interstate needs. Led by a large stakeholder and public interest database comprised of more than 3,000 individuals, engagement was solicited throughout the study using traditional meetings, live webinar sessions, and Internet-based feedback opportunities. Interested parties were asked to provide data, share their opinions and ideas, and assist in the development of recommendations for the I-11 and Intermountain West Corridor.

In addition to recommending alternative corridors for consideration, as a direct

result of public and Stakeholder Partner input, the significance of the Southern Arizona Future Connectivity Segment was elevated, corridors with significant environmental constraints were modified or eliminated, and some corridor segments were recommended for additional analysis.

In total, 750 representatives from more than 350 Stakeholder Partner organizations participated in 61 meetings and events during the study. Over 650 individuals signed in at 10 public meetings conducted at different times and locations throughout the study area, in addition to nearly 3,000 comments received through virtual meetings and online submissions.



The I-11 and Intermountain West Corridor is envisioned to accommodate multiple modes and multiple uses such as highway, rail, and utilities.

## Accommodating multi-use concepts completes the transportation network

The I-11 and Intermountain West Corridor is envisioned to accommodate multiple modes and multiple uses such as highway, rail, and utilities. A high-level, multi-use evaluation was conducted to determine each alternative's ability to accommodate these multiple modes and multiple uses. Figure 8, on the following page, illustrates the portions of the recommended corridors that are suitable for rail, and includes suggested possible new rail corridors that could close north-south gaps in the existing rail network. Closing these gaps will provide an alternate modal system to the proposed highway corridors.

These suggestions will require detailed analyses, and are intended to illustrate the possibilities for rail enhancements in the region that are complementary with an I-11 and Intermountain West Corridor. While private rail companies are responsible for decisions regarding their networks, the analyses and recommendations proposed in this study may provide insight and support for those decisions, as well as foster communication between public transportation agencies,

private transportation companies (including, but not limited to railroads), and economic development partners.

Other uses within the corridor, such as transmission of energy and communications, are feasible through most of the corridor with the possible exception within existing and constricted urban centers, and continue to be a priority for consideration as the corridor is refined and developed.

The I-11 and Intermountain West Corridor and its vicinity represent promising territory for the production and transmission of renewable energy, especially solar. With respect to generation, most of the corridor traverses the Sonoran and Mojave deserts, which have more sunny days per year than nearly anywhere else in the U.S.

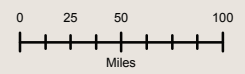
**FIGURE 8. Feasible Potential Rail Corridors**

As part of the high-level, multi-use evaluation, portions of the recommended corridors were found suitable for multiple uses and modes and new rail corridors were identified that could close north-south gaps in the existing rail network.



**LEGEND**

- Recommended I-11 and Intermountain West Corridor
- Existing Rail Network
- Existing Rail Network Corridors Contributing to I-11 and Intermountain West Corridor
- Potential Supplemental Rail Connections
- Other Federal and State Owned/Managed Lands
- Tribal Communities
- U.S. National Park Service, U.S. Forest Service, U.S. Fish and Wildlife Service
- Military Lands
- Private Lands





# GENERATING PROSPERITY

INCREMENTAL INVESTMENTS IN TRANSPORTATION OPEN UP A WORLD OF OPPORTUNITY FOR ECONOMIC GROWTH IN ESTABLISHED AND NEW SECTORS OF OUR ECONOMY. THIS IS CRITICAL TO THE STABILITY AND PROSPERITY OF THE PEOPLE WHO LIVE AND WORK IN THE INTERMOUNTAIN WEST.





## GENERATING SIGNIFICANT RETURN ON INVESTMENT

The Business Case for the I-11 and Intermountain West Corridor demonstrates that the Corridor has the potential to generate a significant return on investment. The I-11 and Intermountain West Corridor will:

- Connect regional economies to each other and to global markets
- Create opportunities for integrated manufacturing
- Advance the economic development initiatives of Arizona and Nevada

### Connecting regional economies to each other and to global markets

A megapolitan can be defined as a conglomeration of two or more intertwined metropolitan areas with a combined population of 5 million or more, and is characterized by interlocking economic systems, shared natural resources and ecosystems, and common transportation and other infrastructure systems. Throughout the U.S., megapolitans are expanding and merging their economies together to form megapolitan clusters. These megapolitan clusters contain most of the nation's major ports and international airports, and provide a powerful presence in world trade. This trend is in line with global competitors in Asia and Europe who 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 megapolitan areas in the greater southwestern U.S.—Southern California, Las Vegas, and the Sun Corridor—have expanded and are interlinked, forming the Southwest Triangle (Figure 9). The increased mobility of workers, business travelers, and goods between the cities

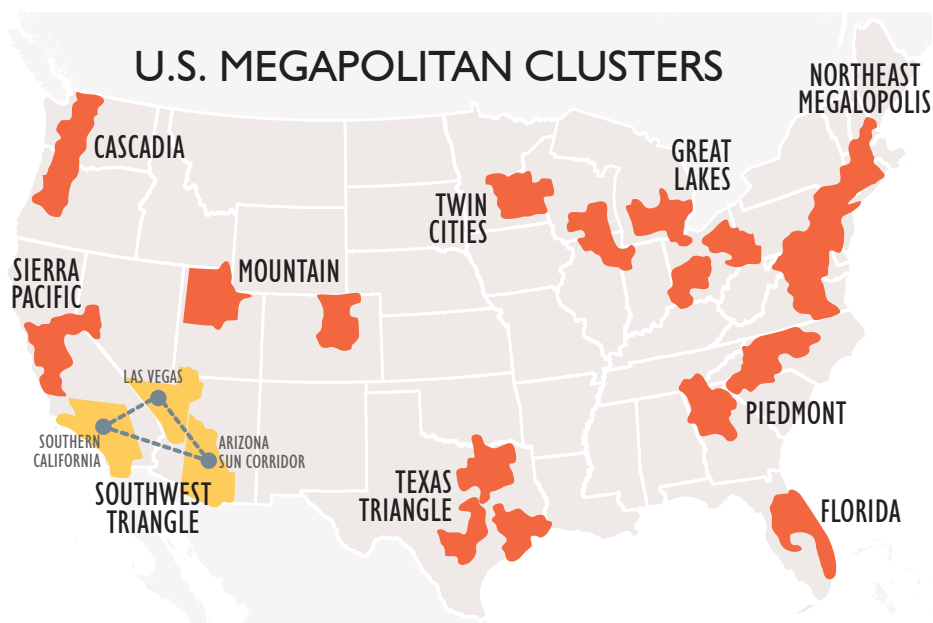
of these megapolitans enables greater collaboration, flexibility, and innovation—leading to a more diverse and stable economy built on technology, innovation, and high-value manufacturing.

The megapolitan cluster capacity for trade is a key element in this economic transition. Failure to establish adequate multimodal infrastructure to move people and goods around the region and across the country will significantly constrain future economic growth.

**Figure 9**

The I-11 and Intermountain West Corridor has the opportunity to connect several megapolitan clusters (defined as two or more intertwined metropolitan areas).

Image Source: Metropolitan Research Center, University of Utah, Brookings Mountain West, 2010.



## MEXICO IS COMPETITIVE FOR MANUFACTURING OUTSOURCING:



# 5.4% growth

Mexico's gross domestic product grew 5.4% in 2010

*New Policy Institute and ASU North American Center for Cross-Border Studies, Realizing the Full Value of Crossborder Trade with Mexico, 2012*

# \$35b increase

Growth in Mexico's gross domestic product in 2010 increased Mexican purchases from the U.S. by \$35 billion

*New Policy Institute and ASU North American Center for Cross-Border Studies, Realizing the Full Value of Crossborder Trade with Mexico, 2012*

# 14<sup>th</sup> largest economy

As of 2012, Mexico is the 14th largest economy in the world

*World Bank, World DataBank: Gross Domestic Product, 2012*

# 6 million

6 million U.S. jobs are dependent on U.S.-Mexico trade

*Wilson, Christopher E.; Working Together: Economic Ties between the United States and Mexico, 2011*

## Creating opportunities for integrated manufacturing

The I-11 and Intermountain West Corridor is positioned to take advantage of current developments in international trade. The I-11 and Intermountain West Corridor offers the potential to introduce new economic activity related to the emerging manufacturing and trade relationship with Mexico, which has been enabled by NAFTA. The nature of this trade-related economic activity, referred to by economists as integrated manufacturing or production sharing, is fundamentally different from that fostered by Asia-Pacific trade. With Asian imports, limited value-added manufacturing occurs after consumer goods are imported. However, efficient transportation links with Mexico create significant opportunities for specialized manufacturing in the U.S., supported by Mexican production. Thus, each country is able to exploit its inherent competitive advantages.

With production sharing, the U.S. and Mexico have built a partnership not only in trading goods, but also in producing them. In many cases it is now more cost effective to manufacture and import goods from Mexico than it is from Asia-Pacific. Several U.S. industries, including auto, appliances, machinery, aerospace, electronics, and medical devices, work with Mexican companies to manufacture goods, often transporting components across the border multiple times during production. Unlike trade with Asia, this trade-related economic activity has resulted in significant manufacturing employment growth in both countries.

In particular, 6 million U.S. jobs are dependent on U.S.-Mexico trade. More than 160,000 jobs in Arizona and Nevada are dependent on trade with Mexico, compared to 692,000 and 463,000 trade-related jobs in California and Texas, respectively<sup>1</sup>. Realization of these integrated manufacturing benefits in the Intermountain West relies upon strong mobility of freight back and forth across the border and along the I-11 and Intermountain West Corridor (Figure 10).



**Figure 10**  
Efficient transportation links with Mexico create significant opportunities for specialized manufacturing in the U.S., supported by Mexican production, where components cross the border multiple times during production.

## Advancing Arizona's and Nevada's economic development initiatives

Over the past few years, Arizona and Nevada have renewed their focus on economic development, and both states recognize the importance of creating high-wage jobs, leveraging existing statewide assets, and improving the foundations that support economic development, such as the construction of efficient transportation infrastructure.

To compete nationally and internationally, each state has developed economic development initiatives focused on building its economy and targeting specific industry clusters (Figure 11).

The Nevada Governor's Office of Economic Development has identified five key components needed to attract major industries to the state and thereby diversify and strengthen its economy. Two of these components directly depend on favorable transportation infrastructure.

- Availability of qualified workforce
- **Competitive cost environment (such as transportation, labor, utilities, real estate, and taxes)**
- **Favorable logistics and accessibility**
- Favorable business environment
- Quality of place

Industry clusters targeted by Arizona and Nevada for diversifying their economies



### Industry Targets

Industry Target	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	■	■	■

Figure 11

Arizona and Nevada must continue to build upon their industries to remain competitive in the global market.

Data Source: Arizona Commerce Authority. 2013. Job by Industry Report for Arizona. EMSI.; Greater Phoenix Economic Council. 2013.; Tucson Regional Economic Opportunities. Tucson Economic Blueprint Strategic Analysis Report. 2006.; Nevada Governor's Office of Economic Development. Key Industries. 2013.

The I-11 and Intermountain West Corridor has the potential to structurally alter the way goods and people move throughout the region.

## ESTIMATING THE RETURN ON INVESTMENT

The return on this investment (ROI) is assumed to be significant, but is difficult to precisely quantify. A multifaceted approach was used to estimate the potential ROI, combining quantitative approaches with qualitative work to compare and validate the estimated costs against the potential travel and economic benefits of an I-11 and Intermountain West Corridor:

- **Travel benefits and cost estimates:** benefit-cost analysis—compares the traditional transportation value of savings to travelers resulting from the project investment with the costs

incurred in constructing and operating the project.

- **Economic benefits:** macroeconomic scenario-based analysis—illustrates the potential magnitude of the economic benefits of the I-11 and Intermountain West Corridor.
- **Validation:** Comparative analysis from other regions of the U.S.—provides information to help characterize some of the new types of economic activity anticipated to occur as a result of the development of the I-11 and Intermountain West Corridor.

“The I-11 and Intermountain West Corridor is more than a transportation corridor, it is an economic corridor. It has the potential to become a major north-south transcontinental corridor through the Intermountain West. This would allow significant commerce, tourism, and international trade opportunities across the western United States, and could help link trade between the U.S., Mexico, and Canada.”

- Michael LeVault, *Maricopa Association of Governments Chair and Mayor of Youngtown, Arizona*



## Comparing the corridor’s travel benefits and cost estimates through a benefit-cost analysis

Benefit-cost analysis is a conceptual framework that calculates and compares the benefits and costs of a project. It is the industry standard for major transportation infrastructure projects, provides a measure of project feasibility and a basis for comparing two or more projects, or alternatives, within a single project. The analysis has been configured around three incremental investment strategies in terms of the state of infrastructure development in the corridor:

- Trend (No-Build) Investment Strategy**—includes projects in both Arizona and Nevada that are included in long-range transportation plans. These projects have already been identified and prioritized by the respective public agency (state Departments of Transportation or regional metropolitan planning organizations) for the sake of improving the regional transportation network regardless of I-11 status. Other scenarios are compared to this baseline to assess both costs and benefits of the investments strategies shown below.
- Interim Investment Strategy**—assumes implementation of the trend (no-build) investment projects, plus additional targeted improvements as needed to create an interim end-to-end corridor through both states. The goal of implementing this interim condition is to achieve a continuous, efficient, high-capacity corridor as quickly as possible and at the lowest cost.

- Full-Build Investment Strategy**—builds upon the previous two investment strategies to complete build-out of a full interstate with sufficient capacity.

Several benefit categories were approximated and monetized to facilitate comparisons against the estimated costs. These benefit categories include travel time savings, vehicle operating costs, safety benefits, emissions benefits, and freight logistics benefits. The total costs for each scenario include both capital and operation and maintenance costs.

Highlights of the I-11 and Intermountain West Corridor benefit-cost analysis results include positive net benefits for both the interim and full-build investment strategies (Figure 12). A net present value (benefit minus cost) greater than zero, and a benefit-cost ratio (benefit divided by cost) greater than one, are general measures of a project’s feasibility. It is expected that the full-build investment strategy will generate more net benefits overall than the interim investment strategy. On the other hand, the interim investment strategy is expected to have a higher return on investment because of the lower cost. These investment strategies reflect costs and benefits for a highway-only corridor from Mexico to Las Vegas.



ADOT is improving US 93 to a 4-lane, divided highway between Wickenburg and the Nevada border, which will serve as an interim facility for I-11.

**Figure 12**

Highlights of the I-11 and Intermountain West Corridor benefit-cost analysis results include positive net benefits for both the interim and full-build investment strategies. These planning level estimates reflect costs and benefits for a highway-only corridor from Mexico to Las Vegas, above and beyond planned improvements.

Investment Strategy	Interim	Full Build
Costs	\$3.6b - 4.4b	\$12b - 12.9b
Net Present Value	\$427m - 3.7b	\$1.8b - 6.5b
Benefit-Cost Ratios	1.2 - 3.0	1.3 - 2.0

## Economic benefits: macroeconomic scenario-based analysis

To help understand the nature and scale of the economic returns to a potential I-11 and Intermountain West Corridor investment, a scenario-based analysis was performed (Figure 13). Specifically, three important trends currently shaping the regional economy were considered, and three separate scenarios were constructed to model the effects of each in terms of changes in travel demand, gross domestic product, population, and employment in the region. The results provide some indication of the scale of economic activity and of travel demand that each scenario may produce. 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:

- **Baseline.** This scenario serves as the background against which the results of the other scenarios are compared, and is the same as the Trend (No-Build) Investment Strategy used in the benefit-cost analysis. Generally, this 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.

- **Growth in Asia-Pacific Trade.** This scenario is based on 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-Pacific Rim sources. This scenario assumes that current trends in manufacturing in the Asia-Pacific region continue and that the U.S. continues to receive a growing volume of goods from Asia.
- **Trade with Mexico Expands (Production Sharing).** This scenario assumes that Asia-Pacific manufacturing for the U.S. market flattens and that significant production

sharing growth occurs between the U.S. and Mexico.

- **State Economic Development Initiatives Are Fully Realized.** This scenario assumes that Arizona and Nevada are able to realize their current major economic development goals. A cornerstone of their initiatives is the implementation of an industry cluster-based approach to foster economic sustainability by stimulating growth in key sectors—such as aerospace, life sciences, and other high-value manufactured goods—and increasing trade with Mexico and Canada. The end result is a group of industry clusters that has the ability to generate economic growth both in the short and long term.

Potential benefits to the regional economy associated with the three growth scenarios can be realized only if the region maintains its current relative competitiveness and is able to attract the level of activity described. Multimodal transportation is a key and necessary enabler of economic development.

**Figure 13**

Each of these scenarios has the potential to make major contributions to the economic well being of the region's residents, bringing up to an additional 240,000 jobs and \$22 billion in economic output to the region over the next 25 years.

SCENARIO	ECONOMIC OUTPUT (\$ BILLIONS)	POPULATION (HIGH RANGE)	EMPLOYMENT (HIGH RANGE)	UNACCEPTABLY CONGESTED HIGHWAYS (%)*
Projected Baseline Conditions (2040)	642	15,078,114	7,971,629	28
Growth in Asia Pacific Trade	+7 to 24	+283,000	+150,000	34
Trade with Mexico Expands (Nearshoring)	+9 to 22	+457,000	+241,000	43
State Economic Development Initiatives Are Fully Realized	+4 to 8	+170,000	+90,000	34

\* Includes major highway corridors in Arizona, California, and Nevada; and assumes completion of trend improvements.

## Validation: comparative analysis from other regions of the U.S.

Available literature was assembled and reviewed to illustrate the relationship between transportation corridor investment and economic outcomes from other U.S. jurisdictions, in order to validate the expectation that these effects will occur. Given the nature of the new and growing economic relationship between U.S. border states and Mexico, the potential scale of this relationship for the Intermountain West may potentially be larger than shown.

*The Best Investment a Nation Ever Made: A Tribute to the Dwight D. Eisenhower System of Interstate and Defense Highways* (Cox and Love, 1998) provides a comprehensive look into the benefits of infrastructure investment. The work discusses the impact of the Dwight D. Eisenhower System of Interstate and Defense Highways at its 40th anniversary in 1996. Interesting findings of that work are that the road system has:

- Saved the lives of an estimated 187,000 people and prevented injuries to another 12 million
- Returned more than \$6 in increased economic productivity for each \$1 spent on construction
- Had numerous intangible impacts such as increased international competitiveness, increased personal mobility, and increased international security

Overall, infrastructure investment has been shown to have a positive impact on economic growth, productivity, and return on investment. According to the report *Economic Returns from Transportation Investment*

(Eno Transportation Foundation, Inc., 1996; and FHWA, 2011), which discusses various infrastructure studies, social rates of return on infrastructure investment are significant and positive, and infrastructure investment has helped raise the nation's productivity and reduce its costs of doing business. An important conclusion of the study is that an increase in infrastructure investment reduces costs in almost all manufacturing industries and in many services; this increase in infrastructure investment also shows a corresponding increase in productivity.

*Transportation's Link to the Economy: Synthesis*, prepared by the Washington State Department of Transportation, reviewed multiple transportation studies and concluded that improvements to surface transportation systems increase economic output, reduce prices, and raise incomes and profits. The study found that transportation contributes economic returns for virtually every person and business in the affected region. Other studies show that state and national investments in transportation have measurable benefits to the economy. One finding is that each \$1 billion of federal highway investment generates 47,500 jobs: 26,500 jobs as roads and bridges are built, and an additional 21,000 jobs as those who earn their money directly from transportation activity buy goods and services (Poor, Lindquist, and Wendt; *Transportation's Link to the Economy: Synthesis*, Washington Department of Transportation; 2008).

The study, *Transportation Improvements Grow Wisconsin's Economy: The Economic Benefits of Transportation Investments*,

identified the following benefits from increased investment in the Wisconsin State Truck Highway System (Cambridge Systematics, Inc., 2003):

- \$7.0 billion in savings for everyday personal trips such as driving to work, doing errands, or visiting friends.
- \$1.5 billion in savings by business persons and truckers while on the clock. The on-the-clock portion of the benefits (the \$1.5 billion) would allow Wisconsin businesses to increase output, hire additional workers, and eventually increase Wisconsin residents' disposable personal income by \$2.7 billion.

Therefore, the total benefits of the additional investment are the sum of the \$7 billion for personal trips, plus the \$2.7 billion of benefits (macroeconomic impacts) created from greater business efficiencies for a total of \$9.7 billion. The benefits (\$9.7 billion) of additional investment (\$3.2 billion) translate into measurable and significant results. For every dollar of additional investment in the Wisconsin State Truck Highway System beyond that needed to maintain current conditions, Wisconsin would enjoy \$3 of benefit.

The study also demonstrated that additional highway investment leads to an increase in permanent new jobs. On an average annual basis, 4,800 more jobs would exist in Wisconsin if the additional investment were made because highway investment reduces the cost of doing business in Wisconsin.

With potential induced macroeconomic effects estimated at up to \$24 billion over the next 25 years, it is clear that the combined economic case for the I-11 and Intermountain West Corridor investment is strong.

## A compelling case for a transformative investment

The three-pronged return-on-investment analysis revealed a compelling case for investment in the I-11 and Intermountain West Corridor if it is part of a coordinated program with strategic border improvements to unlock the shared production potential with Mexico and Canada (Figure 14) and other economic development efforts.

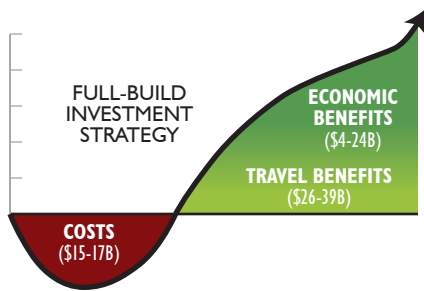
The benefit-cost analysis describes a project whose benefit-cost parameters range between 1.2 and 3.0, depending on the investment strategy under consideration. These parameters are indicative of a socially beneficial project, despite the conservatism of this analysis for a transformational system-level investment. With the opportunity to optimize the sequencing and timing of individual projects over an extended implementation period, the corridor offers Nevada and Arizona the opportunity to realize above-average economic returns from strategic investments for many years.

Infrastructure investment has been shown to have a positive effect on economic growth, productivity, and return on investment. The studies referred to in this report have revealed that social rates of return on infrastructure investment are significant and positive, and infrastructure investment has helped raise the nation's productivity and reduce its costs of doing business. Some of the studies also found that additional highway investment led to an increase in permanent new jobs and improved safety.

The I-11 and Intermountain West Corridor presents Arizona and Nevada with unique and exciting economic opportunities to:

- Sustain historic growth patterns by building on strong economic sectors such as tourism and recreation
- Tap into the resources of Mexico and Canada to strengthen and grow manufacturing capabilities
- Provide access to national and international markets for goods produced, warehoused, and distributed
- Achieve the economic development and diversification vision for both states.

When the combined effects of the corridor investment are considered, the I-11 and Intermountain West Corridor is a compelling candidate for strategic investment. If delivered through a strategic investment program, it will have a sustained positive effect on the economy of the region for decades to come.



**Figure 14**

Figure 14 is solely intended to illustrate the scale of the return on investment potential and not the actual value. Combining the values of the economic and travel benefits may result in an over-estimate due to double counting some factors. These planning level estimates reflect costs and benefits for a highway-only corridor from Mexico to Las Vegas, above and beyond planned improvements.



“The I-11 and Intermountain West Corridor is an essential transportation project for Southern Nevada, that will help generate continued economic growth and diversification for our great state. Its economic significance is a primary reason why the Nevada Legislature, the Clark County Commission, and private businesses overwhelmingly supported the initiative to tie the motor vehicle fuel tax to inflation, which will provide the necessary funding to help build this regionally significant project.”

- Tina Quigley, *Regional Transportation Commission of Southern Nevada, General Manager*





# NEXT STEPS

CONTINUED COLLABORATION BETWEEN CURRENT AND NEW PARTNER AGENCIES AT THE FEDERAL, STATE, REGIONAL, AND LOCAL LEVELS, AS WELL AS IN THE NON-GOVERNMENTAL AND PRIVATE SECTORS, IS PARAMOUNT FOR SUCCESS.



## PARTNERING FOR THE FUTURE TO DELIVER THE PROJECT VISION

The recommended I-11 and Intermountain West Corridor (depicted in Figure 7 on page 19) is envisioned to be a continuous high-capacity trade corridor extending from Nogales, Arizona to Las Vegas, Nevada and potentially beyond towards Canada. This trade corridor is anticipated to support the diversification of the economies of both Arizona and Nevada to include a higher proportion of large-scale manufacturing operations that will rely on dependable movements of goods and services between the two states and adjacent regions. As each state's manufacturing sector expands, the Corridor should be evaluated to determine the most appropriate mode of freight travel and facility type to provide the greatest reliability of trade movements. This chapter provides suggested steps that will continue the momentum to incrementally provide the right transportation solution to serve the evolving economies of Arizona and Nevada and Arizona.

To this end, it is paramount for transportation, economic development, and environmental/sustainability leaders to partner and advance along the same paths—reliant on each other for success. Delivering the project vision will depend on continued collaboration between current and new partner agencies at the federal, state, regional, and local levels, as well as in the non-governmental and private sectors. And, while anticipated to be a multimodal transportation corridor, strong partnering with the two major western Class I railroads will be critical to implement a continuous rail corridor, including potentially providing strong incentives for constructing missing links within the overall I-11 and Intermountain West Corridor. Key opportunities and challenges related to successfully providing the right transportation solution are listed in Figure 15, on the following page.

The I-11 and Intermountain West Corridor Study is a multimodal planning effort, involving the Arizona and Nevada Departments of Transportation, Federal Highway Administration, and Federal Railroad Administration. Upon completion of this study, these agencies will all be called upon to continue to advance the separate modes and uses for the corridor.

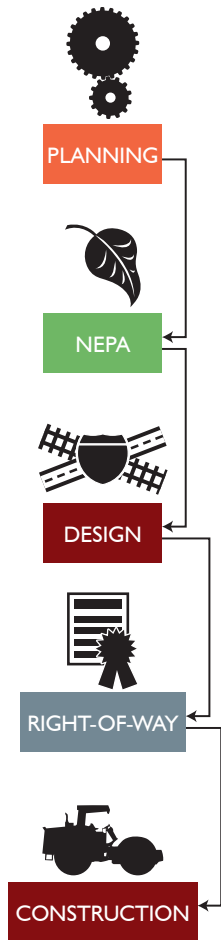
Arizona Governor Jan Brewer and Nevada Governor Brian Sandoval at Future I-11 Sign Unveiling Ceremony at the Hoover Dam, March 21, 2014. Since a portion of the I-11 Corridor was designated by Congress as part of the MAP-21 Federal Transportation Bill in 2012, Arizona and Nevada have been working together to advance the I-11 and Intermountain West Corridor.

Photo Credit: Andrew Wilder, Arizona Governor's Office



**Figure 15**

The project development process ensures project decisions balance project needs with social, economic, and natural environmental factors through each phase of the project.



## Partnerships ensure project decisions balance project needs

The project development process, shown in Figure 15, allows transportation officials to make project decisions that balance engineering and transportation needs with social, economic, and natural environmental factors. During the process, a wide range of partners, including the public, businesses, interest groups, and agencies at all levels of government, provide input into project and environmental decisions.

Several opportunities and challenges related to the core elements to the vision for the I-11 and Intermountain West Corridor are highlighted in Figure 16. In order to “develop multimodal infrastructure”, as noted in the Vision Statement, different agencies and organizations will be needed to lead implementation of each mode or use. Funding will most likely come from separate sources, and the timeframe for the demand for each mode or use

will likely differ—potentially impacting the initiation of design and construction activities, as well as ongoing corridor operations.

The benefit of having agencies representing these other modes and uses participating in this project allows the establishment of a corridor that meets the needs of all modes. However, while the specific modal project development will be led by different agencies, continued coordination among agencies is critical for establishment of a corridor that meets the needs of all modes to achieve a shared vision regarding land use, economic development, and the natural environment. This early agreement on the corridor location will streamline the National Environmental Policy Act (NEPA) process (required when federal funding or decisions are required) and subsequent phases for each mode and use.

**Figure 16**

Opportunities, challenges, and recommended strategy elements related to the I-11 and Intermountain West Corridor Vision. Detailed strategy actions are presented in the Implementation Program Technical Memorandum.

CORRIDOR VISION ELEMENT	OPPORTUNITIES AND CHALLENGES	RECOMMENDED STRATEGIES
Promote freight linkages	<ul style="list-style-type: none"> <li>Connect commerce centers with each other and with new and expanding ports</li> <li>Achieve consensus across borders and with new partners</li> </ul>	<ul style="list-style-type: none"> <li>Close gaps in the regional network</li> <li>Prioritize the critical bottlenecks</li> <li>Remove international trade barriers</li> <li>Enhance capacity incrementally but effectively</li> <li>Use technology to improve efficiency</li> </ul>
Create new western crossroads	<ul style="list-style-type: none"> <li>Integrate planning between land use, transportation, economic development, and environmental resources</li> </ul>	<ul style="list-style-type: none"> <li>Make connections between communities in a context-sensitive manner</li> <li>Find ways, large or small, in which all communities can benefit in a manner that respects community values</li> <li>Preserve opportunities at strategic sites</li> <li>Integrate lessons from corridor development elsewhere</li> </ul>
Spur economic diversity	<ul style="list-style-type: none"> <li>Realize a return on investment</li> <li>Develop funding streams</li> </ul>	<ul style="list-style-type: none"> <li>Understand and illustrate economic benefits of corridor development</li> <li>Seek public-private partnerships</li> <li>Expand alliances beyond Arizona and Nevada boundaries</li> </ul>
Develop multimodal infrastructure	<ul style="list-style-type: none"> <li>Expand rail, energy and communication network</li> </ul>	<ul style="list-style-type: none"> <li>Coordinate with private rail companies and the FRA</li> <li>Coordinate with energy, communications and utility companies</li> </ul>

# SEGMENTS OF INDEPENDENT UTILITY FACILITATE EFFICIENT IMPLEMENTATION

Because of the broad scope and scale of the overall I-11 and Intermountain West Corridor, it is broken down into individual segments of independent utility to meet the NEPA requirement of logical termini and independent utility.

Identifying segments of independent utility allows more efficient implementation through the project development process, while still supporting the overall need for corridor continuity. Currently, the I-11 and Intermountain West Corridor is comprised of many different project segments at varying degrees of progress in the project development process, and these segments of independent utility are anticipated to form the basis of independent future studies and/or projects, all joined together under a shared project vision (Figure 17).

While the Las Vegas Metropolitan Area is tentatively comprised of several segments of independent utility, the selection of a singular preferred I-11 and Intermountain West Corridor alignment will reduce the range of segments of independent utility. The existing project development status of the various segments of independent utility is summarized on Figure 17.

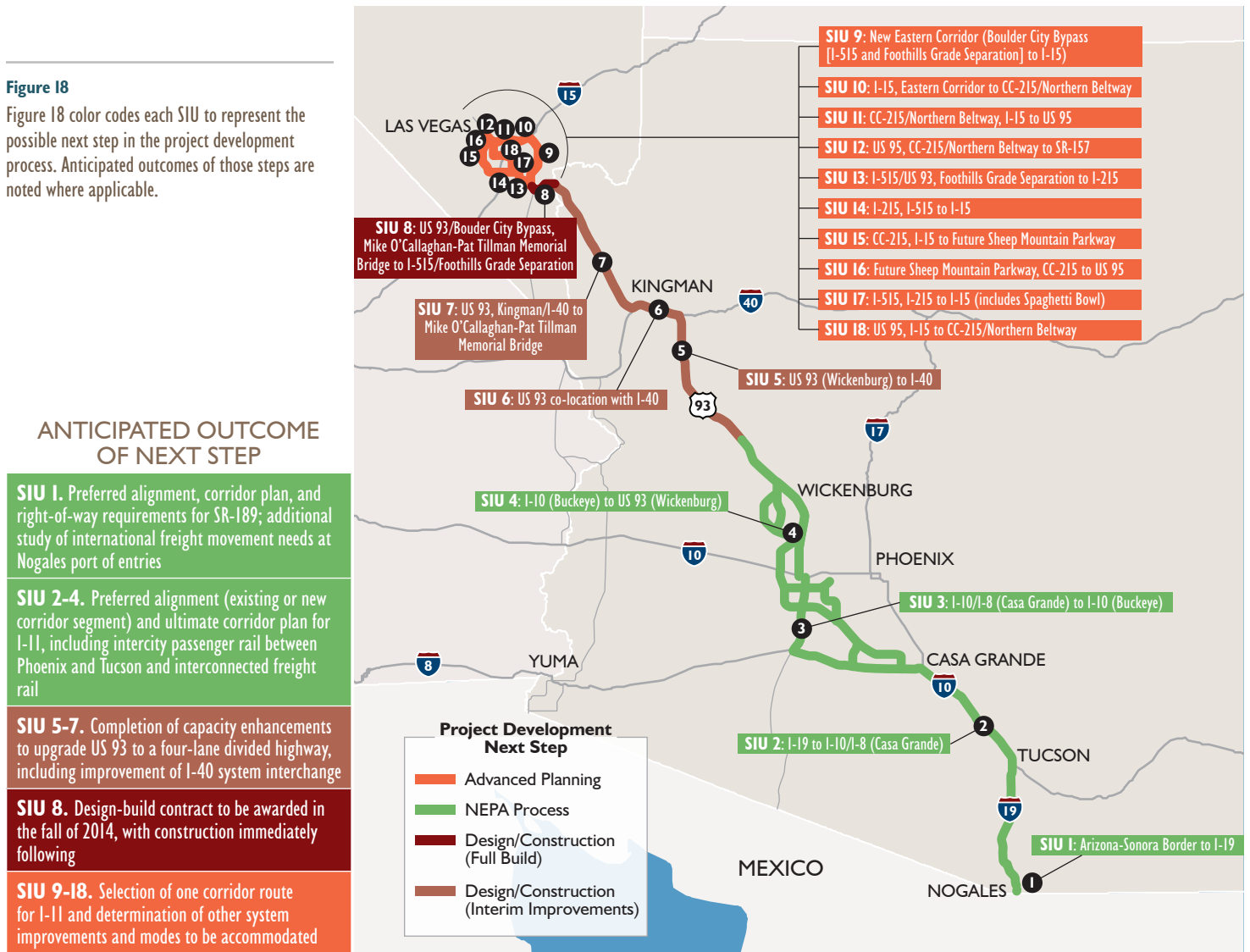


**Figure 17**  
Illustrates the corridor’s 18 segments of independent utility (SIU), which are colored to clearly illustrate SIU endpoints. The status of project development activities completed to date are noted for each SIU. This segmentation does not include the Northern Nevada Future Connectivity Corridor segment, which requires additional study to determine logical corridor connections.

The identification of segments of independent utility, next steps, and anticipated outcomes are illustrated on Figure 18. This segmentation does not include the Northern Nevada Future Connectivity Segment, which requires additional study to determine logical corridor connections.

**Figure 18**

Figure 18 color codes each SIU to represent the possible next step in the project development process. Anticipated outcomes of those steps are noted where applicable.



## Technical actions provide guidance for near- and long-term project prioritization

In whole, the I-11 and Intermountain West Corridor has the potential to be over 530 miles long between the southern Arizona border and the Las Vegas Metropolitan Area—and double that length to the northern Nevada border. A phased implementation strategy is required to achieve the full build condition that fulfills the vision of a multimodal I-11 and Intermountain West Corridor.

- The “**Interim Corridor**” assumes implementation of targeted improvements to create a continuous 4-lane divided highway from Nogales to Las Vegas. The goal of implementing this interim condition is to facilitate trade movements between Mexico, Arizona, and Nevada – until such a time as the ultimate trade corridor is deemed needed (as depicted in Figure 7 on page 19).
- The “**Full Build Corridor**” completes build-out of a multimodal transportation corridor that will match the needs of future demands for the movement of people and goods. The full build condition is the long-term vision for the Corridor.

# Identifying project actions needed to achieve a free-flowing border-to-border corridor efficiently and in a cost-effective manner

While implementation of the full build I-11 and Intermountain West Corridor is desired to achieve the long-range multimodal vision, the focus of the implementation actions is to achieve an interim border-to-border corridor as efficiently as possible from a timing and cost perspective to begin to reap the benefits of a transcontinental trade corridor. Additionally, because implementation of the full build corridor is not envisioned for several decades, improvements that comprise the full build condition may change as the Corridor evolves and trade and growth patterns change.

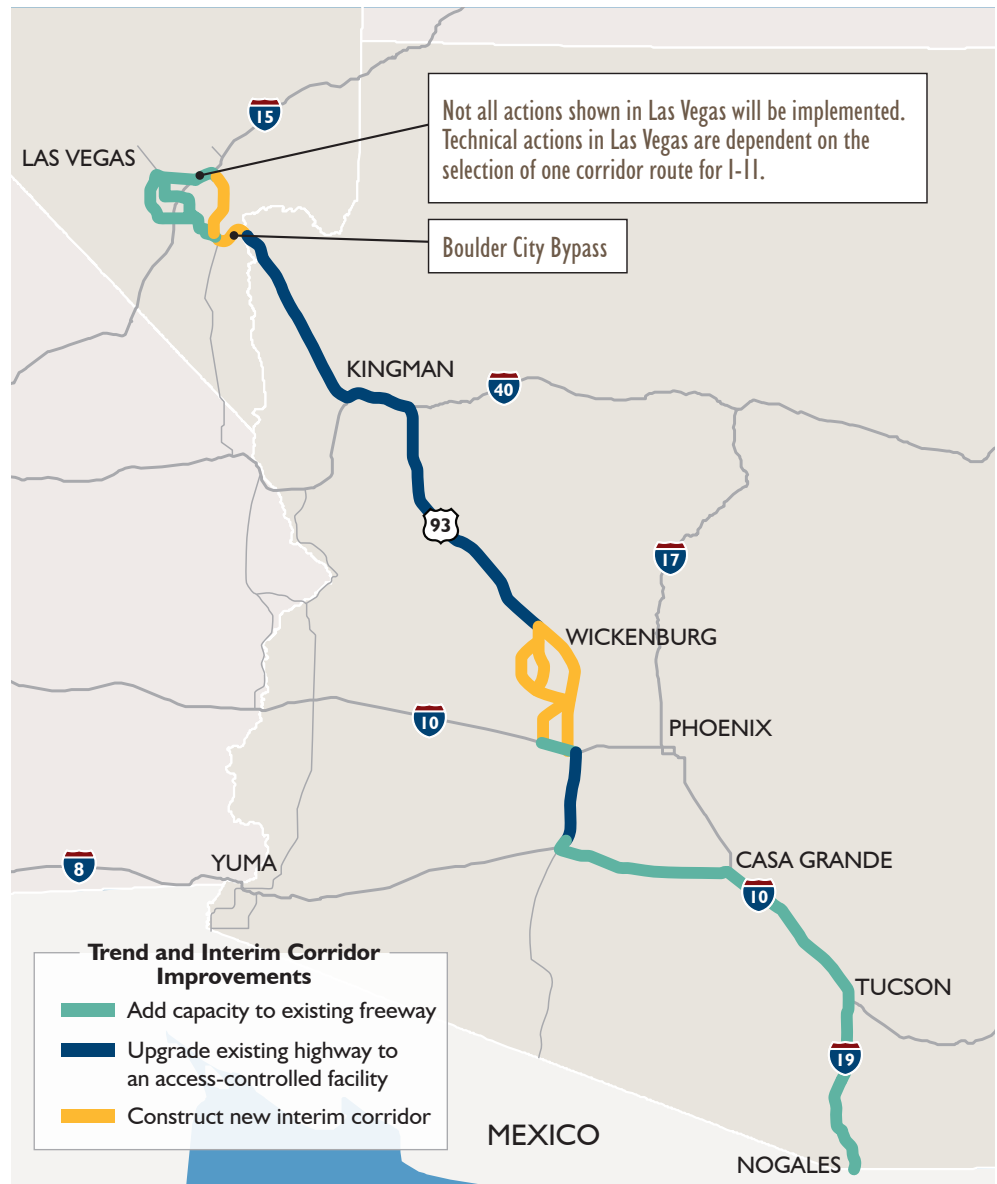
On a practical level, several factors contribute to the need to phase corridor improvements, specifically as it relates to constructing the corridor:

- The U.S. has not had comprehensive long-term federal transportation reauthorization since the lapse of SAFETEA-LU in 2009.
- State DOTs are grappling with funding large transportation infrastructure projects as traditional funding methods are no longer available or reliable. For instance, state gas taxes have not been indexed in over 20 years, and state highway funds are being swept into general funds to balance budget deficits.
- The country – especially the Southwest – is still recovering from the Great Recession. Introducing new tax-based revenue streams are not acceptable to the public at-large at this time.

Therefore, the interim condition of the I-11 and Intermountain West Corridor serves as the near-term implementation step for corridor development (Figure 19). It is important to note that many segments of the corridor have infrastructure in place today that lays the foundation for this interim corridor. Components of the statewide and regional transportation systems with current excess capacity are great candidates to contribute to a border-to-border corridor for the short term, and even potentially the long term. In

some areas, minimal improvements are recommended to enhance the corridor for accommodation of trade traffic. In other portions of the corridor, gaps exist that need to be filled to provide a cohesive connection.

Overall though, the foundation for this corridor exists and can be leveraged to adequately plan and design the vision for this multimodal trade corridor.



**Figure 19**  
Trend and Interim Corridor Projects. Major improvement types required to achieve an interim end-to-end corridor between Mexico and the Las Vegas metropolitan area provide guidance for near-term prioritization of technical actions.

## PUBLIC POLICY ACTIONS FACILITATE CORRIDOR IMPLEMENTATION

Implementation of the I-11 and Intermountain West Corridor will require several simultaneous actions. While project development activities are ongoing, corridor partners should be coordinating economic development and local planning initiatives with implementation of the multimodal transportation corridor. Additionally, funding and financing options should be explored. To ensure all these actions are progressing down the same path, there are a series of public policy actions that can help facilitate corridor implementation. While not noted in detail in this document, the Implementation

Program Report details out the range of actions required, grouped into the following categories:

- Official corridor adoption
- Corridor marketing
- International trade corridor
- Multimodal and multi-use
- Local planning coordination
- Economic development coordination
- Corridor funding and finance
- Metropolitan routing and connections

Development of a trade corridor is absolutely dependent on coordinated

economic development and transportation activities. Once a preferred alignment is selected, the most critical public policy actions include incorporating the corridor alignment into Regional Transportation Plans and land management agency Resource Management Plans. These actions will establish the routing and preserve rights-of-way. With this, corridor champions can rally around the I-11 and Intermountain West Corridor to begin to market and brand this concept, seek economic development opportunities, and foster alliances for development of a competitive trade corridor.

## ENSURING PROJECT DELIVERY THROUGH CREATIVE FUNDING AND FINANCING STRATEGIES

Full development of the I-11 and Intermountain West Corridor is a complex process that will span decades. Consideration of specific funding, financing, and delivery methods for individual projects within the corridor requires a significant amount of detail that will not be available until project development activities are considerably advanced for groups or individual SIUs.

The funding and financing resource options that can be used for implementation of each corridor segment will likely differ and should continue to be explored, including potential emerging funding sources (dynamic tolling, fuel tax indexing, mileage-based user fees, and occupancy fees from road and non-road users of the corridor). While the transportation funding and financing environment rapidly changes, many of the existing sources will be used for decades to come and others may be dropped.

The stakeholders of the I-11 and Intermountain West Corridor should not be passive bystanders in this evolution. Corridor champions can take an active role in encouraging and supporting legislation that creates new, flexible, and appropriate financing tools at all levels of government. Should there be a need for unique mechanisms to develop the I-11 and Intermountain West Corridor, the opportunity exists for corridor champions to take a lead role in securing legislation and regulation to create these.



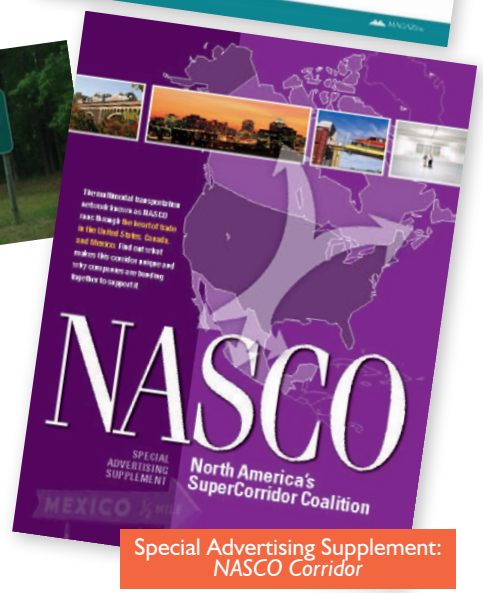
# MARKETING AND BRANDING ACTIONS CREATE A DISTINCT IDENTITY FOR THE CORRIDOR

Fostering the “I-11 brand” for the I-11 and Intermountain West Corridor will create a distinct identity for the corridor; generate interest among the trade and logistics industry, the traveling public, and the economic and community development industry; and create a clear and positive public recognition of the new multimodal corridor. In addition to creating or enhancing public acceptance, a successful branding and marketing campaign delivers the following benefits:

- **Enhanced commitment to the implementation of the I-11 and Intermountain West Corridor:** Branding of various pieces of the corridor will establish a long term identity of the corridor and will help regional agencies reaffirm their commitment to implementing the I-11 and Intermountain West Corridor.
- **Enhanced outreach efforts:** A common brand proposition among various components of the corridor development process will simplify marketing efforts and allow corridor partners to more effectively reach their target audience.
- **Potential for attracting community and economic development activity:** An attractive and compelling brand will help attract new economic development or intensify existing land uses along the multimodal transportation corridor.

Branding will also, over a period of time, bring a feeling of permanence to the idea of a major new multimodal transportation corridor that may be fully implemented over several decades. A next step in the corridor development process will include developing a branding strategy that defines the target audience, the target message, and how the brand will communicate with the target audience. The branding strategy will also determine the appropriate corridor champions to lead these actions.

**Figure 20** Developing a brand creates a distinct identity for the I-11 and Intermountain West Corridor. Example branding tactics are shown below.



# IMMEDIATE ACTIONS NEEDED TO IMPLEMENT THE CORRIDOR

**Risk of Inaction** – The actions listed in Figure 21 form the foundation for the corridor between the Mexican border and Las Vegas metropolitan area. If these actions are not carried out, an international and domestic trade corridor in the Intermountain West will be compromised. As a result, the host states

of Arizona and Nevada will lose significant opportunities to grow and diversify their economies based on enhanced trade afforded by an international commerce corridor such as I-11.

**Figure 21**

**Immediate Next Steps.** The table lists the immediate actions that should be initiated within the next 2 years to maintain the momentum of implementing the I-11 and Intermountain West Corridor. The lead agency should ensure that these immediate technical actions are identified in applicable plans and/or programs, if not already.

ACTION	SIU(S)	LEAD AGENCY RESPONSIBLE	PRIMARY PARTNERS
<b>TECHNICAL ACTIONS</b>			
<b>Improve SR-189 to provide free-flowing and direct access to the Mariposa land port of entry.</b> Complete environmental clearance and then initiate design for SR-189/Mariposa Road to determine improvements from I-19 to the Mexican border.	1	ADOT	FHWA, FRA, regional COGs and MPOs
<b>Initiate environmental clearance and design process for the Phoenix metropolitan area to determine the I-11 corridor alignment between I-10 (Buckeye) and US 93 (Wickenburg).</b>	4	ADOT/MAG	FHWA, FRA
<b>Finish improvements to US 93 for completing a 4-lane divided highway between Wickenburg and I-40.</b> Complete environmental studies, design, and right-of-way acquisition, and construction where required.	5	ADOT	FHWA
<b>Complete construction of the Boulder City Bypass.</b> Award Design-Build contract.	8	NDOT/ RTCSNV	FHWA
<b>Determine preferred corridor and system-wide improvements in the Las Vegas metropolitan area.</b> Initiate Advanced Planning Study.	9-18	NDOT/ RTCSNV	FHWA, FRA
<b>MULTIMODAL ACCOMMODATION</b>			
<b>Coordinate Arizona and Nevada State Freight Plans to ascertain interest, feasibility, and market potential in implementing a continuous north-south trade corridor.</b>	All	ADOT/NDOT (with ultimate lead to be determined)	FRA, Class I railroads, trucking industry, Arizona Commerce Authority, Nevada Governor’s Office of Economic Development
<b>Establish joint Arizona/Nevada State Infrastructure Working Group to ascertain interest and feasibility in co-locating major utility transmission with the I-11 and Intermountain West Corridor.</b>	All	Arizona Commerce Authority, Nevada Governor’s Office of Economic Development, Nevada State Energy Office	ADOT, NDOT, utility industry representatives, BLM, and other federal land agencies
<b>PUBLIC POLICY ACTIONS</b>			
<b>Update Arizona and Nevada long-range transportation plans and state rail plans.</b>	All	ADOT/NDOT	FHWA, FRA, MPOs and COGs
<b>Update state and regional transportation plans, resource management plans, and general/comprehensive land use plans to incorporate I-11 and Intermountain West Corridor location, to ensure corridor preservation.</b>	All	ADOT, NDOT, MAG, RTCSNV, as well as other regional and local agencies	ADOT/NDOT
<b>MARKETING/BRANDING ACTIONS</b>			
<b>Develop an I-11 marketing and branding strategy.</b>	All	To be determined	ADOT/NDOT
<b>Place I-11 signage along the Corridor upon implementation of improvements and/or along existing corridors where co-location is anticipated.</b>	All	ADOT/NDOT	FHWA, COGs and MPOs, DOT district engineering offices

# MOVING FORWARD: EXTENDING THE CORRIDOR NORTH

Arizona and Nevada have jointly led the charge for the I-11 and Intermountain West Corridor—working together to achieve congressional designation for a portion of the corridor, justifying the economic benefit that the corridor can bring to the region, and initiating the

process to determine the corridor’s location. While this study has focused on developing the corridor from Mexico to Las Vegas, the ultimate goal is to form a continuous multimodal connection between Mexico and Canada.

## What about Northern Nevada?

Although this study area spans the entirety of both states, only an initial alternatives evaluation analysis (Level I Screening) was conducted for the Northern Nevada Future Connectivity Segment in order to determine the major economic activity centers that the corridor should connect. Several potential corridor connections were studied and two were found to meet the goals and objectives of the Corridor (Figure 22).

The US 95 corridor options in the western part of the state are seen as viable options for an I-11 and Intermountain West Corridor, connecting the two largest economic activity centers

in the State—the Las Vegas and Reno/Sparks/Carson City metropolitan areas.

The US 93 corridor has statewide significance, connecting the growing rural communities in the eastern part of the state. While it does not meet the goals and objectives of the highway portion of the I-11 and Intermountain West Corridor, the US 93 corridor could provide an opportunity to close a north-south gap in the Intermountain West rail network (as shown on Figure 8 in Chapter 2). More detailed advanced corridor planning will be required to further refine alternatives and provide improvement recommendations.

Figure 22

The Northern Nevada Future Connectivity Corridor includes two alternatives for future consideration as a potential I-11 extension on the west side of the state. In addition, an alternative on the eastern side of the state is shown for statewide significance for future highway improvements or railroad connections (shown as the dashed line).

## What about extending the Corridor to Canada?

Coordination with adjacent states needs to be continued to determine the longer-range vision for connection north of Nevada to Canada. Current corridor options could connect from Northern Nevada to California, Oregon, Idaho, and/or Utah. Understanding the preferred routing through the Northwest U.S.—and other states’ commitments to implementing such a corridor—is critical to further defining a preferred alternative and implementation steps. Furthermore, as preliminary corridor planning continues for the extension of the corridor north, multimodal corridor champions should be defined from all states involved, and should work together to extend the Congressional designation to allow this corridor to receive federal funding in the future.



# SUSTAINING PROJECT MOMENTUM THROUGH CORRIDOR CHAMPIONS

Partnerships among corridor constituents will be required to achieve successful and efficient implementation of the I-11 and Intermountain West Corridor. To date, ADOT, NDOT, FHWA, FRA, MAG, and the RTC of Southern Nevada have led the study efforts and congressional coordination through their partnership in the project’s oversight committee, known as the Core Agency Partners. Upon completion of this study, these partnerships should remain in place and be expanded to include a wide range of corridor supporters (Figure 23).

## Public Sector

*Role:* The public sector plans, designs, and constructs multimodal infrastructure for broad community benefit, using public financial resources. Public sector agencies also regulate land development and management adjacent to transportation corridors.

*Representative Organizations:* Federal agencies (FHWA, FRA, and land management agencies), state agencies (DOTs, economic development organizations, and tourism and convention bureaus), regional agencies (MPOs and COGs), local jurisdictions (cities, towns, and counties), and Tribal communities.

## Private Sector

*Role:* The private sector can expeditiously provide resources that help lay the foundation for corridor development, such as dedicating and/or preserving right-of-way, delivering financing through public-private partnerships, bringing strong support to political leaders, and supporting construction.

*Representative Organizations:* Property owners, developers, private businesses, utility providers, energy companies, data distribution companies, and corridor users, including railroad and trucking companies.

## Non-Profit and Non-Governmental Organizations

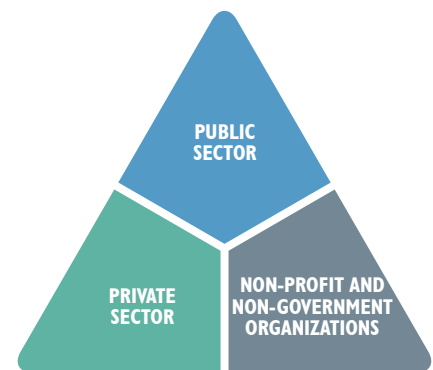
*Role:* Non-profit and non-governmental organizations are generally comprised of wide networks of supporters that can be garnered to assist in research, lobbying, fundraising, generating political support, and other tasks. Forming partnerships with a wide range of organizations can help build support for corridor development.

*Representative Organizations:* Advocacy (I-11 Coalition), transportation (trucking and transit associations), environmental (Sonoran Institute, Sierra Club, and The Nature Conservancy), and economic development (Greater Phoenix Economic Council, Las Vegas Global Economic Alliance, and chambers of commerce) organizations.

## Cross-Collaborative Partnerships

Ideally, partnerships of corridor champions can be made that cross disciplines and political affiliations. The I-11 Coalition is one such example of a successful non-profit corporation that is made up of a series of local and regional public sector organizations, private sector interests, and other non-governmental organizations across both Arizona and Nevada. This group was organized to

promote the vision of the I-11 corridor between Arizona and Nevada, and has been a key player in achieving the congressional designation, as well as building corridor support.



**Figure 23**

Three primary groupings comprise the corridor champions. Continued collaboration between current and new partner agencies at the federal, state, regional, and local levels, as well as in the non-governmental and private sectors, will ensure project momentum.

“This initial planning effort has forged an opportunity for our economic development partners to work in concert with ADOT and NDOT towards a common vision of a diverse and vibrant economic future, while respecting the environmental assets that attract so many people to our states.”

- Michael Kies, PE  
Arizona Department of Transportation  
Project Manager

**ADOT**

“The I-11 and Intermountain West Corridor is our opportunity to shape the future of our region. This corridor has the potential to change the economic landscape of the states of Nevada and Arizona.”

- Sondra Rosenberg, PTP  
Nevada Department of Transportation  
Project Manager

**NEVADA  
DOT**





**INTERMOUNTAIN WEST  
CORRIDOR STUDY**



**CONNECTING BORDERS GLOBALIZES THE INTERMOUNTAIN WEST**