Purpose and Need Memorandum – Final

February 2017

U.S. Department of Transportation
Federal Highway Administration

ADOT

Federal Aid No. 999-M(161)S
ADOT Project No. 999 SW 0 M5180 01P

SUMMARY

The Federal Highway Administration (FHWA) and Arizona Department of Transportation (ADOT) have developed this Purpose and Need Memorandum for the I-11 Corridor Alternatives Selection Report (ASR) and Tier 1 Environmental Impact Statement (EIS). The memorandum provides background information on the evolution and planning context of the I-11 Corridor. It also presents the overall purpose of the I-11 Corridor and outlines the factors that contribute to the need for a transportation facility within the Corridor Study Area. The Purpose and Need is a fundamental part of the National Environmental Policy Act (NEPA) process and provides the basis for identifying, evaluating, and screening corridor alternatives; it will be a key component in selecting a Preferred Corridor Alternative or the No Build Alternative for I-11.

The overall purpose of the I-11 Corridor is to:

- Provide a High Priority, high capacity, access-controlled transportation corridor;
- Support improved regional mobility for people, goods, and homeland security;
- Connect major metropolitan areas and markets in the Intermountain West with Mexico and Canada; and
- Enhance access to the high capacity transportation network to support economic vitality.

The problems, issues, and opportunities that support the need for a proposed transportation facility are:

- Population and employment growth
- Congestion and travel time reliability
- System linkages and regional and interstate mobility
- Access to economic activity centers
- Homeland security and national defense

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Acronyms and Abbreviations

ADOT	Arizona Department of Transportation
AMC	Arizona-Mexico Commission
APRCS	Arizona Passenger Rail Corridor Study
ASLD	Arizona State Land Department
ASR	Alternatives Selection Report
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe
bqAZ	Building a Quality Arizona
EIS	Environmental Impact Statement
FAST	Fixing America's Surface Transportation
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
I	Interstate
ISTEA	Intermodal Surface Transportation Efficiency Act
IWCS	I-11 and Intermountain West Corridor Study
LOS	Level of Service
LPOE	Land Port of Entry
LRTP	Long Range Transportation Plan
MAG	Maricopa Association of Governments
MAP-21	Moving Ahead for Progress in the 21st Century
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
NAFTA	North American Free Trade Agreement
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
NHS	National Highway System
NPS	National Park Service
PAG	Pima Association of Governments
PEL	Planning and Environmental Linkages
PIP	Phased Implementation Plan
Reclamation	Bureau of Reclamation
RITA	Research and Innovative Technology Administration
ROD	Record of Decision
RSRSM	Regionally Significant Routes for Safety and Mobility
RTA	Regional Transportation Authority
RTC	Regional Transportation Commission of Southern Nevada
RTP	Regional Transportation Plan
SCMPO	Sun Corridor Metropolitan Planning Organization

SIU	Segments of Independent Utility
SEZ	Solar Energy Zone
SR	State Route
STRAHNET	Strategic Highway Network
UPRR	Union Pacific Railroad
US	United States
USDOT	United States Department of Transportation
USFS	United States Forest Service

1 INTRODUCTION

1.1 Overview

The Federal Highway Administration (FHWA) and Arizona Department of Transportation (ADOT) are conducting the environmental review process for the Interstate 11 (I-11) Corridor from Nogales to Wickenburg, Arizona. An Alternatives Selection Report (ASR) and Tier 1 Environmental Impact Statement (EIS) will be prepared as part of this process in accordance with the National Environmental Policy Act (NEPA) and other regulatory requirements. The FHWA is the Federal Lead Agency and ADOT is the Local Project Sponsor under NEPA.

The environmental review process builds upon the prior *I-11 and Intermountain West Corridor Study* (IWCS) completed in 2014, which was a multimodal planning effort that involved ADOT, the Nevada Department of Transportation (NDOT), FHWA, Federal Railroad Administration (FRA), Maricopa Association of Governments (MAG), Regional Transportation Commission of Southern Nevada (RTC), and other key stakeholders. The IWCS identified the I-11 Corridor as a critical piece of multimodal infrastructure that would diversify, support, and connect the economies of Arizona and Nevada. The study also concluded that it could be part of a larger north-south transportation corridor, linking Mexico and Canada.

In December 2015, the United States (US) Congress approved the Fixing America's Surface Transportation (FAST) Act, which is a 5-year legislation to improve the nation's surface transportation infrastructure. The FAST Act formally designates I-11 throughout Arizona, reinforcing ADOT's overall concept for the I-11 Corridor that emerged from the IWCS study.

The FHWA and ADOT are continuing to study the I-11 Corridor in Arizona for the approximate 280-mile section between Nogales and Wickenburg, as shown on **Figure 1-1** (Project Location) and **Figure 1-2** (I-11 Corridor Study Area [Nogales to Wickenburg]). Initially, the ASR will assess a comprehensive range of corridor alternatives that are 2,000 feet wide through a robust evaluation process that uses public and agency input as well as various topographical, environmental, and other planning information to help identify opportunities and constraints. The number of corridor alternatives will then be reduced to a reasonable range and carried forward into the Draft Tier 1 EIS along with the No Build Alternative (i.e., do-nothing option). The future I-11 will not require a 2,000-foot-wide right-of-way; generally, an interstate facility with 4 lanes would have a right-of-way footprint of 400 feet. The actual footprint will be identified and evaluated in the Tier 2 environmental phase.

The Draft Tier 1 EIS will continue to assess in more detail the potential social, economic, and natural environmental impacts of the No Build Alternative and remaining corridor alternatives (i.e., Build Alternatives). A Preferred Corridor Alternative will be identified in the Draft Tier 1 EIS, including a Phased Implementation Plan (PIP) that will provide an initial concept for proposed incremental projects within the I-11 Corridor that could be pursued in the future following completion of the Tier 1 EIS. A combined Final Tier 1 EIS and Record of Decision (ROD) will document a Selected Corridor Alternative from Nogales to Wickenburg, or select the No Build Alternative.

1.2 Purpose of Memorandum

The FHWA and ADOT have developed this Purpose and Need Memorandum for the I-11 Corridor ASR and Tier 1 EIS. The memorandum provides background information on the evolution and planning context of the I-11 Corridor. It also presents the overall purpose of the I-11 Corridor and outlines the factors that contribute to the need for a transportation facility within the Corridor Study

Area. The Purpose and Need is a fundamental part of the NEPA process and provides the basis for identifying, evaluating, and screening corridor alternatives; it will be a key component in selecting a Preferred Corridor Alternative or the No Build Alternative for I-11.

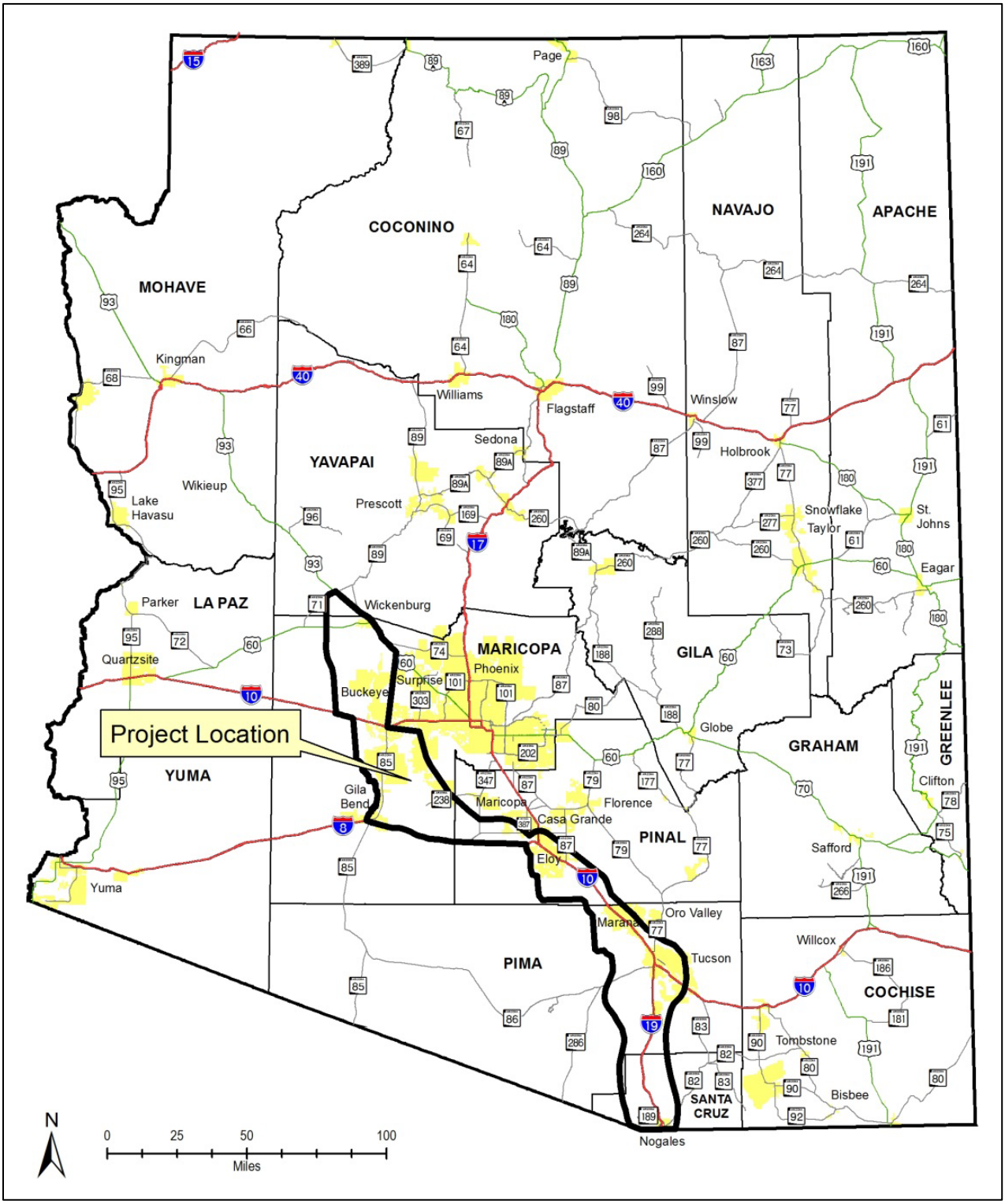

Figure 1-1 Project Location

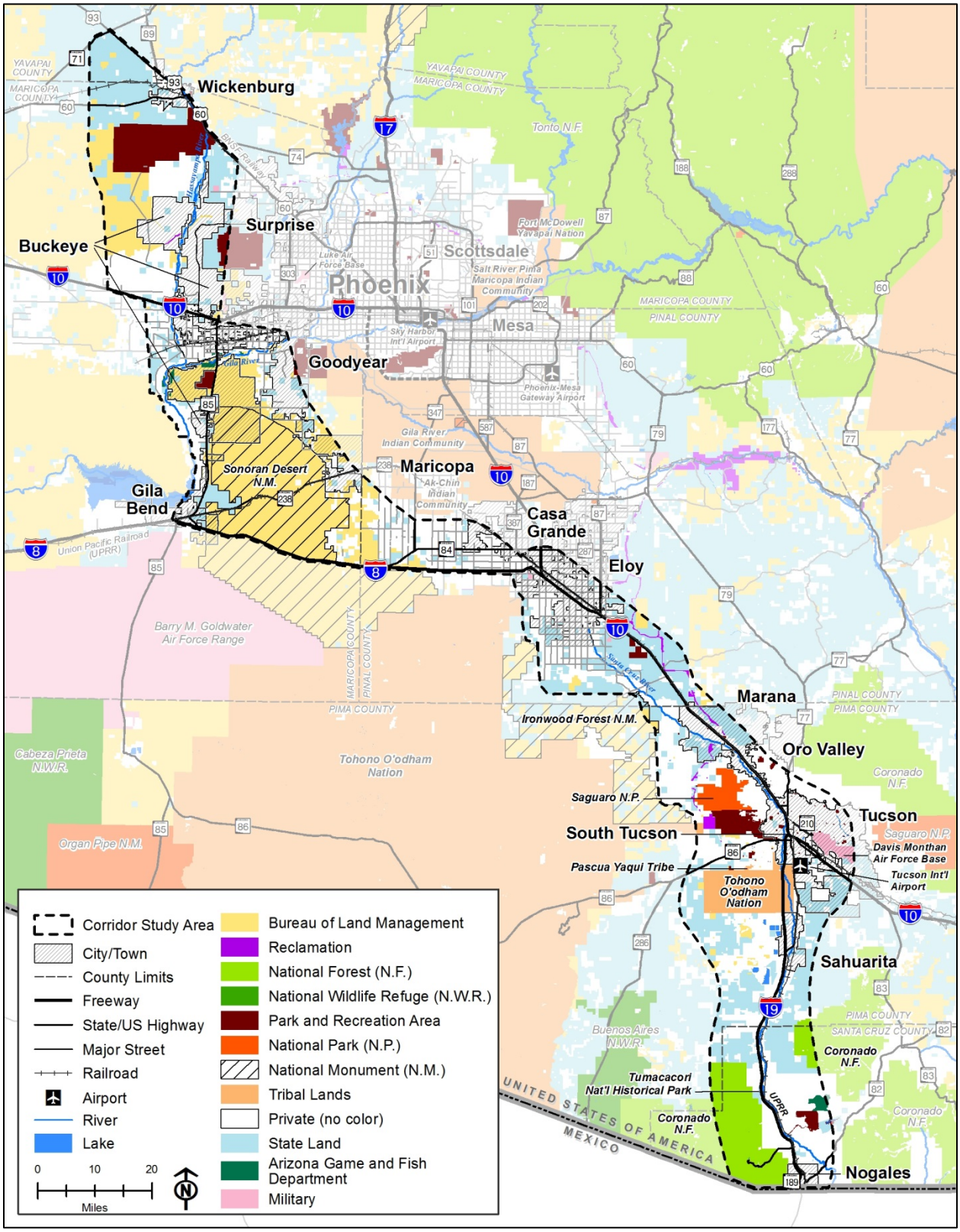

Figure 1-2 I-11 Corridor Study Area (Nogales to Wickenburg)

2 BACKGROUND

The concept of a high-capacity, north-south interstate freeway facility connecting Canada and Mexico through the western US has been considered for more than 20 years. It was initially identified as the CANAMEX trade corridor outlined in the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), established under the North American Free Trade Agreement (NAFTA) in 1993, and defined by Congress in the 1995 National Highway Systems Designation Act (Public Law 104-59). CANAMEX was designated as High Priority Corridor #26 in the National Highway System (NHS), recognizing the importance of the corridor to the nation's economy, defense, and mobility.

In 2014, the NDOT and ADOT jointly completed the IWCS that encompassed a broad study area for the Intermountain West region from Mexico to Canada. The purpose of the IWCS was to determine whether sufficient justification exists for a new high-capacity priority transportation corridor, and if so, to establish the likely potential routes. The study established the corridor vision, developed justification, and defined an implementation plan to move forward. It was intended to provide a high-level overview of the corridor opportunities and foundation for subsequent corridor alternative and environmental studies.

The NDOT and ADOT engaged the public and stakeholders throughout the IWCS. The study also involved a high-level environmental review of corridor alternatives through the FHWA's Planning and Environmental Linkages (PEL) process. This effort resulted in Segments of Independent Utility (SIU) to provide potential logical termini and independent utility for future NEPA studies. Accordingly, the IWCS provided the initial basis for the I-11 Corridor Study Area that advanced into this environmental review process, incorporating the SIUs from Nogales to Wickenburg, as shown on **Figure 2-1** (Prior I-11 Study Recommendations, 2014).

2.1 Study Area

2.1.1 Evolution of Corridor Study Area Boundary

Minor revisions have been made to the I-11 Corridor Study Area boundary since the IWCS and PEL were completed in response to related studies, comments received during scoping, and early consideration of the scoping input. The evolution of the I-11 Corridor Study Area boundary is described below, and shown on **Figure 2-2** (Evolution of the Study Area Boundary).

On the southern end, the initial I-11 Corridor Study Area from Nogales to Casa Grande (i.e., SIU #1 and SIU #2) was the result of opportunities and constraints analyses conducted as part of the IWCS and PEL. The area between the I-19/State Route (SR)189 interchange and US-Mexico border (i.e., SIU #1) is under evaluation as part of a separate feasibility study and subsequent environmental assessment. Accordingly, the proposed concept for the ultimate configuration of the I-19/SR189 interchange would include free-flow ramp movements, a grade separation from local arterials, and corridor management improvements. These proposed improvements would address the transportation needs in this immediate area to Mexico, and as such, the I-11 Corridor Study Area for the ASR and Tier 1 EIS was subsequently truncated in Nogales, with the logical terminus at the I-19/SR189 interchange location.

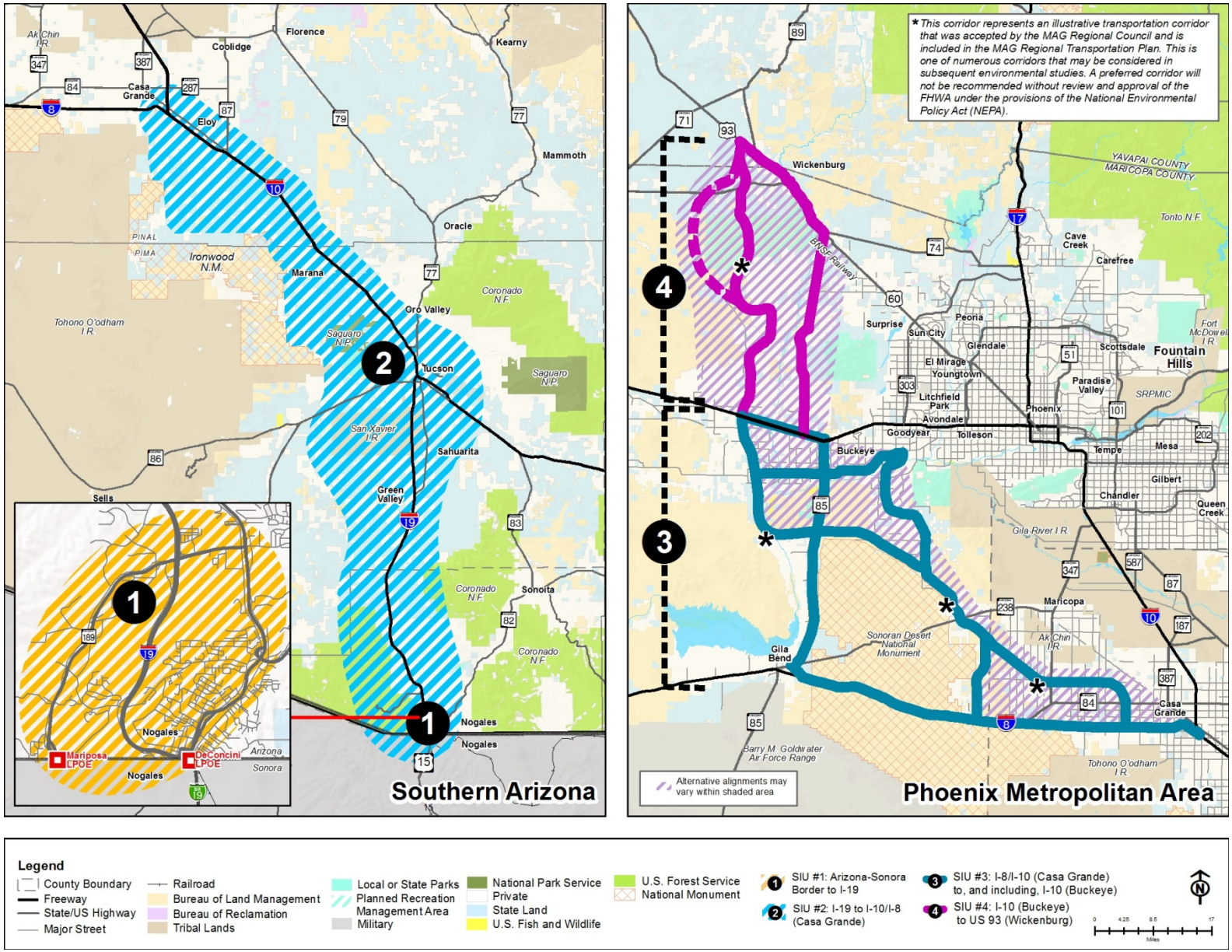

Figure 2-1 Prior I-11 Study Recommendations, 2014

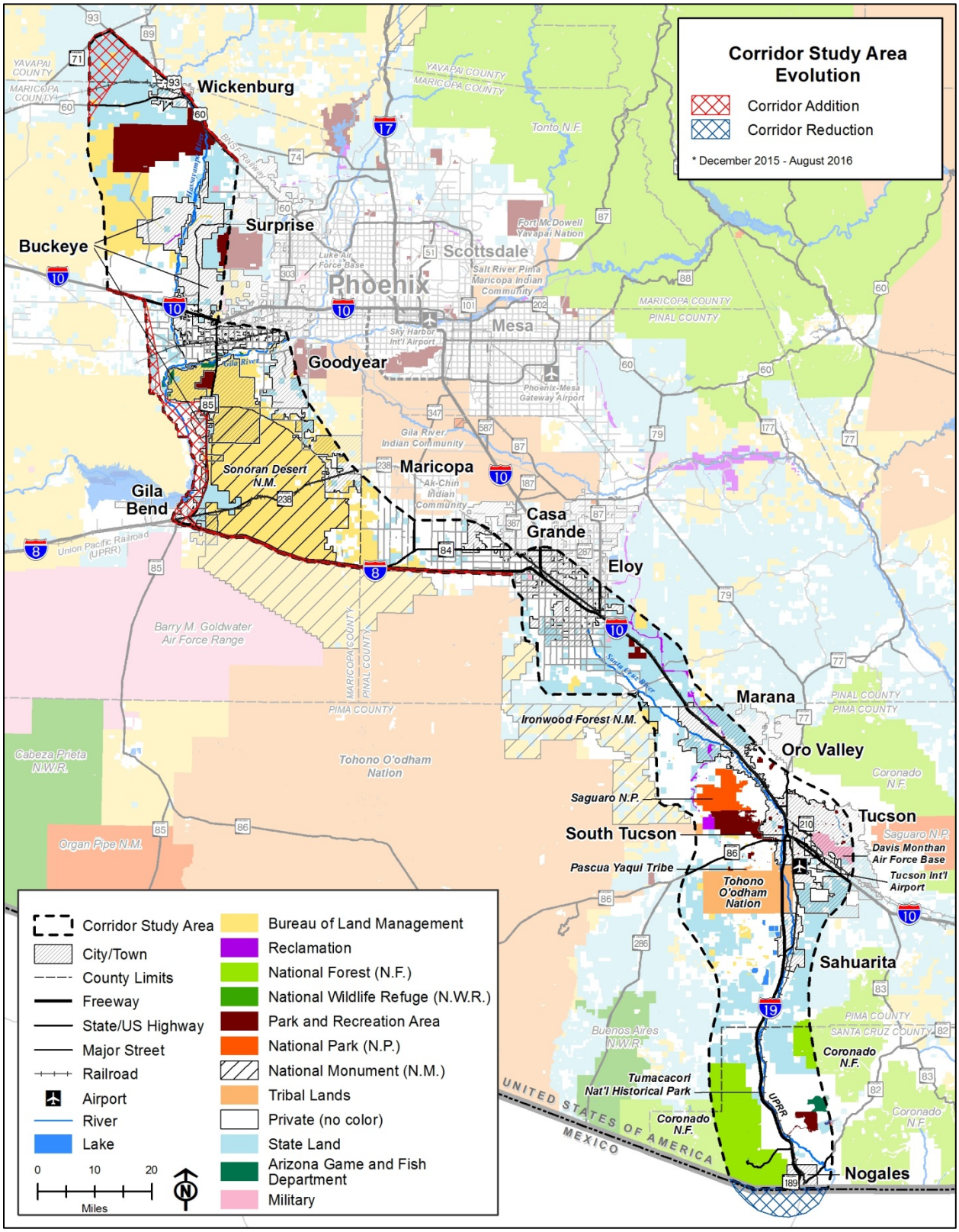

Figure 2-2 Evolution of the Study Area Boundary

From Casa Grande to Wickenburg (i.e., SIU #3 and SIU #4), the I-11 Corridor Study Area initially represented the outer limits of the range of feasible corridor alternatives defined in the IWCS and PEL. Through data collected during scoping and early technical analysis of this information following scoping, the I-11 Corridor Study Area for the ASR and Tier 1 EIS was subsequently modified to encompass a slightly larger area west of SR 85 between Gila Bend and I-10. The expansion allows a wider range of alternatives to be considered in this area to avoid sensitive environmental resources associated with the Sonoran Desert National Monument, Gila River, and other topographical/ hydrological constraints.

The IWCS and PEL identified US 93 as the most suitable connection for the I-11 Corridor in northern Arizona, with the northern terminus initially established near US 93 and SR 89. Due to public and agency feedback received during scoping, the northern terminus of the I-11 Corridor Study Area for the ASR and Tier 1 EIS was subsequently extended further northwest to incorporate the intersection of US 93 and SR 71. As such, the potential traffic impacts at US93/SR71 will be studied, along with a possible terminal end point for I-11 further northwest of Wickenburg along US 93. Expanding the western boundary along US 60 will also facilitate the inclusion of the planned industrial development at Forepaugh Rail Park.

Beyond the I-11 Corridor Study Area, ADOT continues to dedicate funding to widen and improve US 93 north of Wickenburg on a section-by-section basis independent of the I-11 Corridor environmental review process. The ultimate goal is to transition US 93 to an access-controlled interstate freeway. An access-controlled highway is designed for high-speed vehicular traffic and has no traffic signals, intersections, or property access. With an access-controlled highway, opposing directions of travel are generally separated by a median strip or central reservation containing a traffic barrier or grass. Elimination of conflicts with other directions of traffic dramatically improves safety and capacity.

2.1.2 ASR and Tier 1 EIS Study Area

Figure 1-1 (I-11 Corridor Study Area [Nogales to Wickenburg]) depicts the logical termini, existing transportation network, municipalities, and land uses within the I-11 Corridor Study Area for the ASR and Tier 1 EIS. As shown, the I-11 Corridor Study Area extends approximately 280 miles from Nogales to Wickenburg. The southern terminus of the I-11 Corridor Study Area is located at I-19 and SR 189 in Nogales, with the northern terminus at US 93 and SR 71 near Wickenburg. The I-11 Corridor Study Area traverses five counties: Santa Cruz, Pima, Pinal, Maricopa, and Yavapai. It also encompasses the following 14 local municipalities and includes or is adjacent to four tribal communities:

- Nogales
- Sahuarita
- South Tucson
- Tucson
- Oro Valley
- Marana
- Eloy
- Casa Grande
- Maricopa
- Gila Bend
- Goodyear
- Buckeye
- Surprise
- Wickenburg.
- Gila River Indian Community
- Ak-Chin Indian Community
- Tohono O'Odham Indian Community
- Pascua Yaqui Tribe

Existing interstate freeways within the I-11 Corridor Study Area include I-19 from Nogales to Tucson; I-10 from Tucson to Casa Grande; I-8 from Casa Grande to Gila Bend; and I-10 from Buckeye to Tonopah. The state highway network also contains SR 189 and SR 82 in Nogales; SR 86, SR 210, and SR 77 near Tucson; SR 87, SR 287, SR 347, and SR 84 near Eloy and

Casa Grande; SR 238 in Gila Bend; SR 85 between Gila Bend and Buckeye; and SR 89 and SR 71 near Wickenburg. US 60 and US 93 border the northern end of the Corridor Study Area.

The Union Pacific Railroad (UPRR) runs adjacent to I-19 and I-10 in the southern end of the Corridor Study Area, before turning west toward Gila Bend along SR 238, and Burlington Northern Santa Fe (BNSF) Railway parallels US 60 in the northern portion of the Corridor Study Area to Wickenburg.

Land ownership and management throughout the corridor includes a mix of privately-owned properties, Arizona State Land Department (ASLD), US Forest Service (USFS), National Park Service (NPS), Department of Defense, Bureau of Land Management (BLM), and Bureau of Reclamation (Reclamation). Four tribal communities are located within or adjacent to the Corridor Study Area, including the Districts of the Tohono O'odham Nation (i.e., San Xavier, San Lucy, Schuk Toak, and Sif Oidak), Pascua Yaqui Tribe, Ak-Chin Indian Community (adjacent), and Gila River Indian Community (adjacent). Major rivers flowing through the I-11 Corridor Study Area consist of the Santa Cruz River from Nogales to Casa Grande, Gila River from Gila Bend to Goodyear, and Hassayampa River from Buckeye to Wickenburg.

2.2 Planning Context

The I-11 Corridor has also been identified as a critical need in various statewide plans, regional transportation plans (RTP), and various municipal planning documents. These related plans provide insight into the issues and needs identified by ADOT, regional agencies, and local communities that lay the foundation for the concept of a new interstate corridor in Arizona. **Figure 2-3** (Related Planning Recommendations in I-11 Corridor Study Area) shows the location of potential freeway corridors, passenger rail corridors, and freight focus areas that are identified in various related planning documents.

2.2.1 State Planning

ADOT has prepared a number of statewide plans to respond to projected growth and support key corridors for commerce, including but not limited to:

- ***Long Range Transportation Plan (LRTP)*** (2011a) is ADOT's approved statewide, long range plan that will be updated in 2017. A goal of this planning effort is to identify transportation investments that support economic growth, improve mobility, and link transportation with land use patterns.
- ***Building a Quality Arizona (bqAZ) Statewide Transportation Framework Study*** was completed by ADOT in 2010 to address projected 2050 population and employment growth and collaboratively identify priorities and strategies for meeting infrastructure needs as part of a comprehensive 2050 vision.
- ***Arizona's Key Commerce Corridors Report*** (ADOT 2014) supports transportation improvements to enhance economic development. The report outlines six key transportation corridors "…where improvements to the transportation infrastructure supports the greatest potential commercial and economic benefits." Three of the Key Commerce Corridors -- I-19 from Nogales to Tucson; I-10 from Tucson to Phoenix; and I-11 from Phoenix to Las Vegas -- are located in the I-11 Corridor Study Area.

ADOT is also investigating other possible freeway corridors that may intersect with the I-11 Corridor Study Area. The proposed North-South freeway corridor is identified as a potential future connection between eastern Maricopa County and Eloy. The proposed Sonoran Corridor,

or SR 410, would connect I-10 and I-19 in Tucson and provide access to a developing industrial corridor south of the Tucson International Airport. Separate Tier 1 environmental review processes are currently underway for both of these corridors.

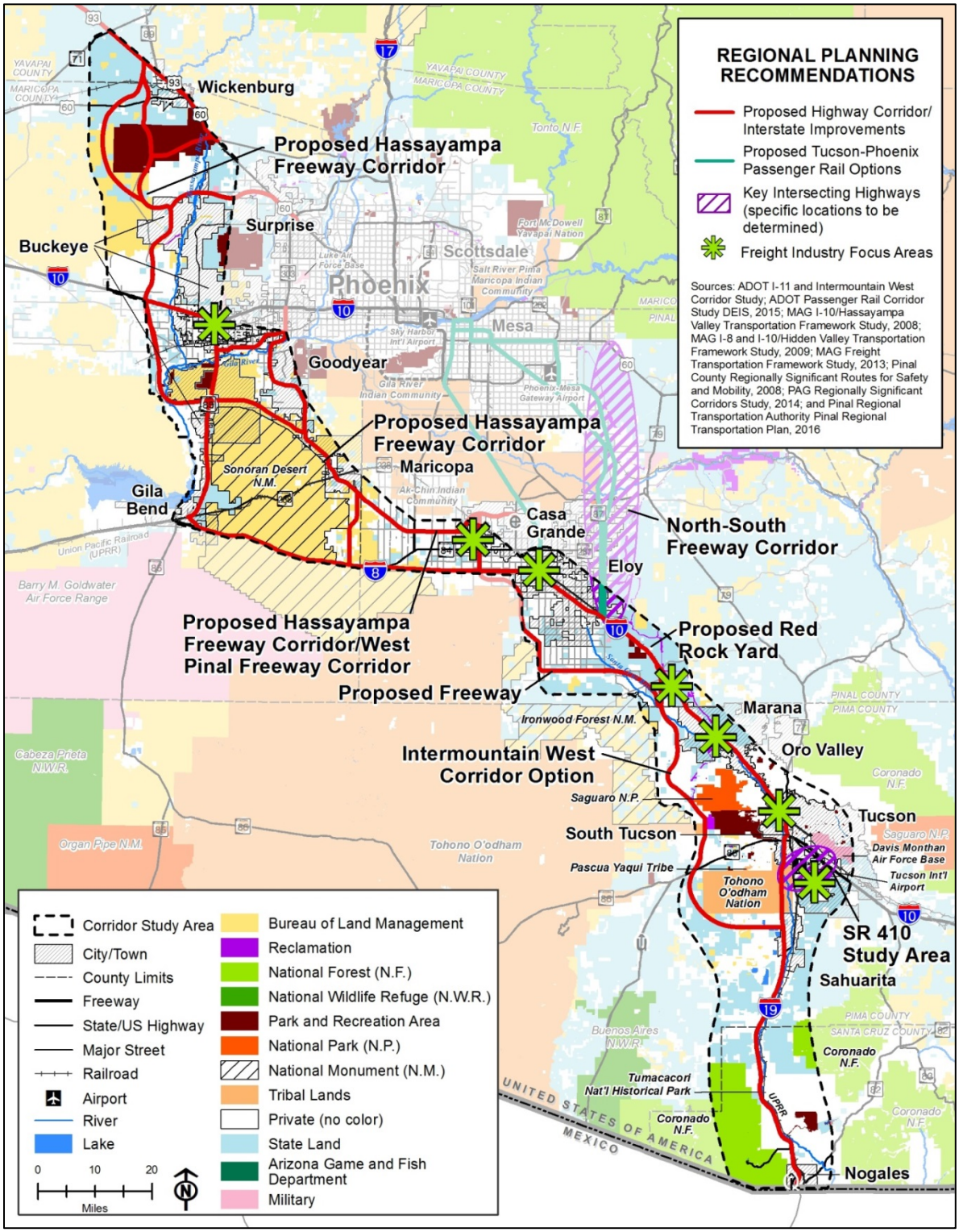

Figure 2-3 Related Planning Recommendations in I-11 Corridor Study Area

2.2.2 Regional Planning

Several key regional studies and plans within the I-11 Corridor Study Area include, but are not limited to:

- ***Pima Association of Governments (PAG) 2045 Regional Mobility and Accessibility Plan*** (2016) identifies the PAG region's long range transportation needs and anticipated revenues, laying out a blueprint for transportation solutions over the next 30 years. Projects to improve the performance of the interstate system include reconstruction of traffic interchanges and widening of some segments of I-10 and I-19. SR 410, or the Sonoran Corridor, in the southeastern Tucson metropolitan area is designated as a High Priority Corridor of the NHS in the FAST Act (http://www.fhwa.dot.gov/planning/national_highway_system/high_priority_corridors/).
- ***PAG Regionally Significant Corridors Study*** (2014) is a technical assessment of existing, planned, and proposed major transportation corridors in and around the PAG region that would achieve broad regional objectives. A regionally significant corridor is identified within the I-11 Corridor Study Area, but acknowledges that no specific alignment has been determined in Pima County.
- ***Pinal Regional Transportation Plan*** (2016) includes a high capacity route between the Pinal-Maricopa county line and I-8 to promote freight movement, link communities, and strengthen economic development and job growth countywide (Pinal Regional Transportation Authority [RTA] 2016). This proposed West Pinal Freeway corridor has been supported as a potential I-11 route via resolutions by the cities of Maricopa and Eloy, Pinal County, and Sun Corridor Metropolitan Planning Organization (SCMPO).
- ***Pinal County Regionally Significant Routes for Safety and Mobility*** (RSRSM) (2008) provides a system of higher capacity routes to improve safety, access, and mobility throughout the county, as well as connecting to adjacent counties. These routes were formed through a partnership with federal, state, county, local, tribal community, and private stakeholders. An alternate route to I-10 is designated as a "new corridor" and "under analysis," generally running from I-8 to I-10 on the west, connecting Arica Road and Baumgartner Road. An update to the RSRSM is currently underway and pending approval.
- **MAG's Regional Framework Studies** established a network of freeways, parkways, and arterial streets in high growth areas. The *I-10/Hassayampa Valley Transportation Framework Study* (2007) and *I-8 and I-10/Hidden Valley Transportation Framework Study* (2009) established the Hassayampa Freeway corridor from Casa Grande to Wickenburg, providing an alternate route to bypass the congested Phoenix metropolitan core. The Hassayampa Freeway corridor in Maricopa County would connect with the West Pinal Freeway corridor in Pinal County, as shown on **Figure 2-3** (Related Planning Recommendations in I-11 Corridor Study Area).
- ***MAG Freight Transportation Framework Study*** (2013) noted the I-11 Corridor as the "cornerstone for seamless and efficient transportation of goods, services, people, and information between Canada, Mexico, and the United States." This was a joint effort conducted on behalf of the metropolitan planning organizations (MPOs) spanning the Tucson to Phoenix corridor, or the Sun Corridor. The goal was to plan the appropriate transportation infrastructure to attract freight-related economic development by taking advantage of the Sun Corridor's prime location to serve the West Coast, Intermountain West, and Mexican deep-water ports within a day's truck drive. **Figure 2-3** (Related

Planning Recommendations in I-11 Corridor Study Area) identifies freight industry focus areas that were identified in the study.

2.2.3 I-11 and Intermountain West Corridor Study

The Business Case developed in the IWCS demonstrated that an I-11 Corridor could expand opportunities for economic growth in Arizona by increasing the state's stability and prosperity, which is a key priority of the Governor's Office and in line with ADOT's Legacy Vision: Creating a transportation system for Arizona that improves the quality of life (https://www.azdot.gov/about/inside-adot/MissionandVision).

Specifically, the Business Case concluded that the I-11 Corridor Study Area would:

- **Connect regional economies to each other and to global markets.** The megapolitan areas in the greater southwestern US—Southern California, Las Vegas, and the Sun Corridor— have expanded and are interlinked, forming the Southwest Triangle shown on **Figure 2-4** (Southwest Triangle within Megapolitan America). The increased mobility of workers, business travelers, and goods between the cities of these megapolitans would enable greater collaboration, flexibility, and innovation— leading to a more diverse and stable economy built on technology, innovation, and high-value manufacturing.

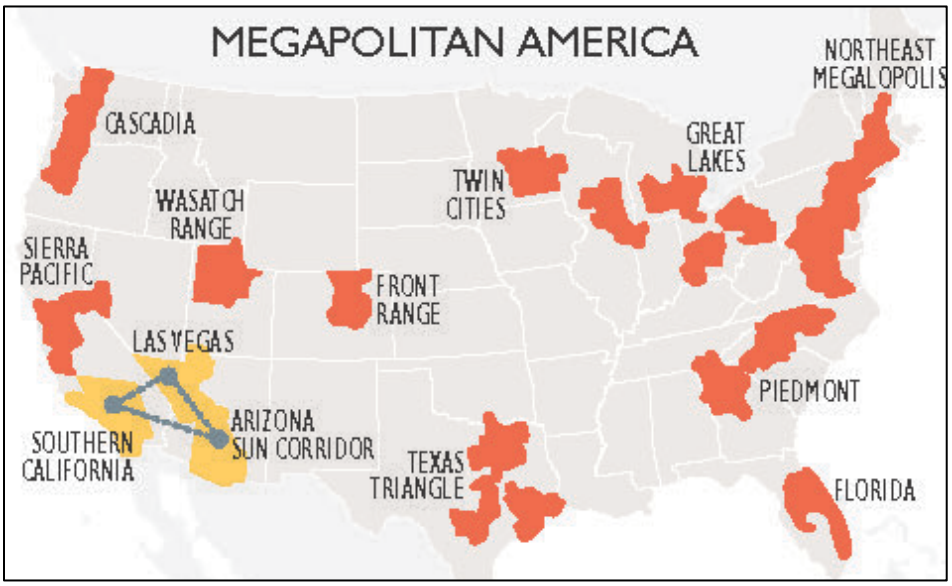

Figure 2-4 Southwest Triangle within Megapolitan America

- **Create opportunities for integrated manufacturing.** The I-11 Corridor is positioned to take advantage of current developments in international trade, and offers the potential to facilitate new economic activity related to the emerging manufacturing and trade relationship with Mexico, which has been enabled by NAFTA. Efficient transportation links with Mexico would create significant opportunities for specialized manufacturing in the US, supported by Mexican production. Thus, each country would be able to exploit its inherent competitive advantages.
- **Advance the economic development initiatives.** Over the past few years, agencies and local communities in Arizona have formulated economic development initiatives, and 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, Arizona communities have advanced economic development initiatives focused on building its economy and targeting specific industry clusters—many of which directly depend on favorable transportation infrastructure.

Overall, congestion in the Southwest Triangle shown on **Figure 2-4** (Southwest Triangle within Megapolitan America) is increasing. This area is on a trajectory to be the strongest American region that maintains linkages to the world's fastest emerging economies in Asia and Latin America. The transportation network in this region was developed decades ago to serve the economic, population, and mobility needs at that time – east-west movements of people and goods between southern California and the rest of the country. The need is increasingly reflecting north-south demands due to integrated manufacturing and as Mexican ports are expected to function more and more as reliever or alternative ports for foreign goods to enter North American markets. Currently, the ports of Los Angeles and Long Beach are key ports for trade with Asia, but expansion possibilities are constrained by adjacent urban development. Alternatives to the ports and the increasingly congested north-south interstate freeways in California may stimulate demand for additional north-south routes such as the I-11 Corridor to accommodate the movement of freight in the Intermountain West. In addition, Arizona is among the states actively engaged in promoting new trade with Mexico and Latin America (NDOT and ADOT 2013).

The West in general and the Southwest region in particular, are underserved by north-south interstate freeway capacity. A direct interstate freeway link between the two largest regions in the interior Southwest – Phoenix and Las Vegas – would provide backup capacity to the I-5 Pacific route. By contrast, I-85 and I-81 in the eastern US serve as a critical redundancy to the I-95 coastal Interstate. This capacity has enabled a logistics (i.e., planning and control of the flow of goods and materials), supply chain, and manufacturing capacity to emerge for a wide-array of products. Such roadways are critical to logistics and trade flows in the East and allow for a more efficient use of I-95. Adding a similar capacity to the West via I-11 would create similar supply chain and trade links between the interior West and Mexico. It would also help relieve the heavy burden of both logistics and passenger travel along I-5 in California. Finally, the I-5 route is particularly vulnerable to earthquakes; a backup interior route would mitigate major disruptions in commerce if I-5 were unusable for an extended period due to a natural disaster.

The current and anticipated trends in US trade, both domestically and with Mexico and Asia, suggest that the western US will experience substantial growth in the regional economy, accompanied by corresponding growth in travel demand. **Figure 2-5** (Existing and Future Congestion on Southwest Interstates, 2012 and 2030) shows the current and projected congestion levels on major interstates throughout the Southwest region. Congestion has impacts on the general traveling public, commuters and freight, affecting businesses, suppliers, manufacturers, and the overall economy. If congestion affects freight productivity and delivery times, costs are passed on to consumers in the form of higher prices. Congestion can result in unreliable trip times and missed deliveries. If infrastructure supporting freight traffic ensures travel time reliability, manufacturing and retail firms can carry reduced inventory because they can rely on goods delivered on time (NDOT and ADOT 2013).

In addition to the Business Case, the IWCS also included an implementation program consisting of a series of critical actions to be initiated within two years of the study's completion to maintain momentum and take advantage of opportunities to grow and diversify the economy. Initiating the environmental review process between Nogales and Wickenburg was a main goal, which eventually evolved into this Tier 1 EIS.

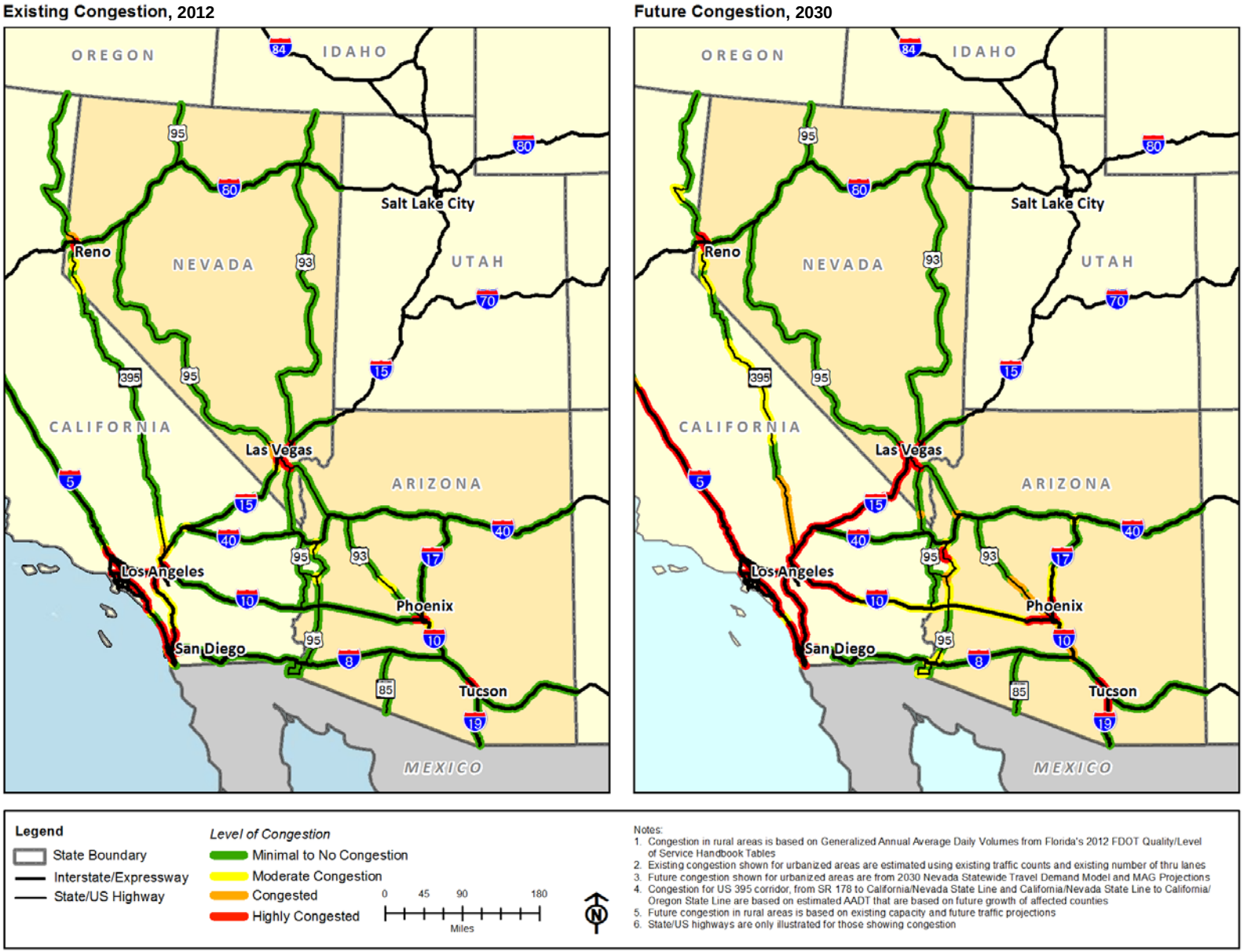

Figure 2-5 Existing and Future Congestion on Southwest Interstates, 2012 and 2030

2.3 Multimodal Considerations

In a 2016 progress update of the LRTP, the economic outlook of Arizona was suggested to outpace the US in terms of jobs, population, and real income growth (ADOT 2016). This economic growth would result in impacts on the multimodal transportation system. Rail facilities and services already exist within the I-11 Corridor Study Area, and/or are under study as part of the *Arizona Passenger Rail Corridor Study*, *State Rail Plan Update*, and *State Freight Plan*. These independent study efforts are examining future needs with regard to rail service within or near the I-11 Corridor Study Area, and as a result, rail is not being considered as part of the Tier 1 EIS for the I-11 Corridor. Nonetheless, the FHWA and ADOT will coordinate with these existing rail services and studies, as well as utility and energy stakeholders, to ensure that a multimodal facility (i.e., rail and utility) is not precluded in the future, to the maximum extent feasible.

2.3.1 Passenger Rail

Currently, Amtrak provides passenger rail service to Maricopa and Tucson via the Sunset Limited route operated by the UPRR. ADOT has been working closely with the FRA and other agencies to study potential passenger rail service between Tucson and Phoenix. The *Arizona Passenger Rail Corridor Study* (APRCS) Final Tier 1 EIS and ROD (ADOT 2016c, 2016d) was prompted by a growing population and travel forecasts, with limitations to increase capacity on the existing transportation system between Tucson and Phoenix. Forecasts from prior studies indicate that a planned widening of I-10 and a proposed new North-South freeway corridor connecting Eloy with Phoenix would not provide enough capacity to serve expected travel demand (ADOT 2016c), and the capacity that does exist is frequently affected by unpredictable freeway conditions that impede travel flows (e.g., road restrictions or closures due to crashes, work zones, isolated weather events like dust storms, flooding, etc.). The Selected Alternative for passenger rail would serve a different travel market than I-11, since it is located to the east, serves commuter travel within the Phoenix and Tucson metropolitan areas, and would serve the East Valley of Maricopa County. About 80 percent of the projected 2035 trip demand to be served on proposed passenger rail service would be commute trips of less than 40 miles (ADOT 2016c).

The *Southwest Multi-State Rail Planning Study*, led by FRA, was completed in 2014 and included the states of Arizona, California, and Nevada. This study outlined a preliminary vision for high-speed rail and provided a model framework for other regions of the US to use for transportation network planning. The study indicated that several multi-state corridors in the Southwest US could potentially address increasing constraints on the transportation network. The analysis suggested the connection between southern California and the Phoenix metropolitan area was a candidate for initial “Core Express” high-speed rail service characterized by speeds over 125 miles per hour (mph). The FRA recommended that the study findings be considered in individual state rail plans, including an examination of governance and funding options. ADOT will consider these study findings in the *State Rail Plan Update*, and therefore, this type of high-speed passenger rail service is not being studied in the I-11 Corridor Tier 1 EIS.

2.3.2 Freight Trucks and Rail

Presently, most freight movements across the US-Mexico border within the I-11 Corridor Study Area are carried via truck and rail. The Arizona-Mexico Commission (AMC) and US Department

of Transportation (USDOT), Research and Innovative Technology Administration (RITA), indicates commerce in the form of freight trucks, trains, and containers is increasing. For example, annual freight truck-container crossings were 763,000 in 2013, representing a notable 10-year growth from approximately 600,000 in 2003. The AMC also reports nearly $55 million in bi-national trade and $7.3 million in tourism expenditures are conducted daily through the eight Arizona-Sonora Land Ports of Entry (LPOEs) (ADOT 2014a).

The *Arizona State Freight Plan*, currently being prepared by ADOT, will establish immediate and long range plans for freight-related transportation investments. More specifically, it will identify freight transportation facilities that are critical to Arizona's economic growth and give appropriate priority to investments in such facilities. In a review of the economic context of freight movement in Arizona (ADOT 2015b), ADOT reviewed key freight sectors and their contribution to Arizona's economy, freight activity and flows, and transportation performance and needs. While the multimodal system in Arizona currently supports efficient freight movements, freight mobility constraints include freeway congestion bottlenecks in urbanized areas and along key commerce routes, lack of north-south rail infrastructure, and at-grade rail crossings (ADOT 2015e). Consistent with these findings, the needs within the I-11 Corridor Study Area include congestion relief and alternative high capacity routes to support more efficient freight movements.

Two Class I railways operate in the I-11 Corridor Study Area: UPRR and BNSF. Generally, UPRR has served the southern half of Arizona with main line service along the east-west Sunset Limited that parallels I-8 and portions of I-10; branch service to the Phoenix metropolitan area; and the Nogales branch from Tucson to the DeConcini port in Nogales. BNSF operates the Transcon mainline parallel to I-40 in northern Arizona and a north-south branch line that connects the Transcon route to the Phoenix metropolitan area. At this time, adequate capacity is available for current and near-term anticipated demand (BNSF 2016; ADOT 2013). Consequently, a need has not been identified for specific freight rail facilities in the I-11 Corridor Study Area.

North-south freight movements may grow in the future due to nearshoring or other changes in regional and global trade patterns. The existing north-south freight rail routes through Arizona are not necessarily direct and would require traversing congested metropolitan areas. However, not all freight movements are suitable for rail; generally higher volumes and longer distances are more cost-effective for rail service. If new rail facilities are identified as a need to address future freight requirements, the privately-held railroads would be responsible for investment decision-making in that regard. No private railroad company has proposed facilities within the I-11 Corridor Study Area, and as such, plans for freight rail facilities are not being considered in this Tier 1 EIS.

Further, the FRA and Federal Transit Administration (FTA) are the federal agencies with jurisdiction over rail, whereas the FHWA's mission is to improve mobility on US freeways through national leadership, innovation, and program delivery. The FHWA provides stewardship over the construction, maintenance, and preservation of the nation's freeways, bridges, and tunnels. The FHWA does not have jurisdiction over rail, and as such, as the Federal Lead Agency for the I-11 Corridor Tier 1 EIS, the FHWA's primary focus will be on a vehicular transportation facility (i.e., interstate freeway). However, the corridor alternatives for a proposed transportation facility will be developed so a multimodal facility (i.e., with rail and utility) is not precluded in the future, to the maximum extent feasible. The FHWA and ADOT will continue to coordinate with the agencies that have jurisdiction over rail and utilities throughout the environmental review process.

2.3.3 Utilities

Throughout the IWCS, NDOT and ADOT engaged the utility and energy industry stakeholders and invited them to provide data and share options and ideas on decision points. As part of this effort, a Utility/Energy Focus Group was established early in the process to frame the discussion of multimodal needs and opportunities. The discussions highlighted the point that utility providers typically only invest in additional infrastructure as demand merits. The participants indicated that no long-range utility or energy plans currently exist, nor do utility or energy expansion needs exist however, long-term flexibility of a common or consolidated corridor should be considered (NDOT and ADOT 2013b).

Although there are no specific needs for utility infrastructure in the Corridor Study Area at this time, the BLM has identified potential locations for the future development of solar energy, or solar energy zones (SEZ). The *Solar Programmatic EIS* (BLM 2012) shows the Gillespie SEZ approximately 1 mile west of the Corridor Study Area, between I-10 and the Gila River. It is anticipated to reach maximum solar development (2,094 acres) over a period of 20 years (BLM 2012). No other SEZs are found within the Corridor Study Area however, the solar energy potential of the Corridor Study Area is high (National Renewable Energy Laboratory [NREL] 2017). In development of any solar facility, transmission to a load center will be an important consideration.

If the need for new utility facilities is identified in the future, the privately held utilities will be responsible for the investment decision-making. No private utility company has expressed immediate interest in a common corridor within the I-11 Corridor Study Area, and as such, plans for utility facilities are not being considered in this Tier 1 EIS. However, the corridor alternatives will be developed so that opportunities to co-locate adjacent utilities within the overall corridor are not precluded in the future Tier 2 analysis, to the extent possible. .

2.3.4 Technology in Transportation

Technology in transportation is rapidly changing and there is ongoing research and development in autonomous vehicles, connected vehicles, and other advancements. While some of these technologies may affect capacity needs, the nature and pace of change is still uncertain. The assumptions regarding the potential footprint of a transportation facility will be based on a typical cross section at this time, and the ability to adapt or respond to future conditions should be retained to the extent possible. Advancement of Tier 2 projects would be dependent on demand as identified through regional transportation planning processes, and it is expected that projected volumes will account for the pace of technological change over time. For example, if technology increases the capacity of the existing transportation network then construction of new or expansion of existing facilities may be delayed until projected volumes warrant.

3 PURPOSE AND NEED STATEMENT

An early step in preparing an EIS is to determine if a transportation problem(s) or other need(s) exist in a defined study area. If the analysis demonstrates a Purpose and Need for a proposed action, the EIS process would continue with evaluation of a reasonable range of alternatives for a transportation solution that would meet the Purpose and Need. Therefore, the Purpose and Need provides the basis for identifying, evaluating, and screening corridor alternatives, leading to the selection of a Preferred Corridor Alternative or No Build Alternative.

3.1 Purpose of Proposed Action

The overall purpose of the I-11 Corridor is to:

- Provide a High Priority, high capacity, access-controlled, transportation corridor;
- Support improved regional mobility for people, goods, and homeland security;
- Connect major metropolitan areas and markets in the Intermountain West with Mexico and Canada; and
- Enhance access to the high capacity transportation network to support economic vitality.

The objective of providing a High Priority, high capacity, access-controlled facility is consistent with federal legislation including the 1995 National Highway System Designation Act (P.L. 104-59) and the 2012 Moving Ahead for Progress in the 21st Century Act (or MAP-21, P.L. 112-141) Section 103.

3.2 Other Desirable Outcomes, Goals, or Objectives

While not part of the fundamental purpose for the proposed I-11 Corridor, there are several other desirable outcomes for consideration.

- Provide the opportunity for multimodal use should needs arise in the future
- Support the protection of sensitive tourist attractions in accordance with applicable plans and policies.
- Support the protection of the environment and cultural resources in accordance with applicable plans and policies.
- Support coordination with other federal and state agencies to maintain the integrity of wildlife movement.

3.3 Need for Proposed Transportation Facility

Previous studies identified key transportation-related problems and issues in the I-11 Corridor Study Area, which have been refined through agency coordination and public involvement during scoping. The assessment of needs builds upon the Planning and Environmental Linkages documentation prepared as part of previous studies (NDOT and ADOT 2014b). The problems, issues, and opportunities in the I-11 Corridor Study Area as organized in the sections that follow are:

- Population and employment growth
- Congestion and travel time reliability
- System linkages and regional and interstate mobility
- Access to economic activity centers
- Homeland security and national defense.

3.3.1 Population and Employment Growth

Projected population and employment growth is an indicator of future travel demand within the I-11 Corridor Study Area. Current and projected population and employment densities are shown on **Figure 3-1** (Population Densities, 2015 and 2035) and **Figure 3-2** (Employment Densities, 2015 and 2035), respectively. **Table 3-1** (Population and Employment Growth, 2015 to 2035) lists the growth anticipated in the five I-11 Corridor counties, including the portions within the Corridor Study Area. Within the Maricopa County portion, population and employment are projected to more than triple, increasing by 284 percent (+211,400) and 320 percent (+35,200) from 2015 to 2035, respectively. During that same time period, similar high growth rates are also forecasted for employment within the Pinal County portion of the Corridor Study Area at 342 percent (+44,500). Pima County would have the greatest growth in both population (+219,500) and employment (+110,800). The rate and location of this population and employment growth contributes to increasing congestion and travel time reliability issues, and exacerbates lack of connectivity as employment and commerce patterns shift.

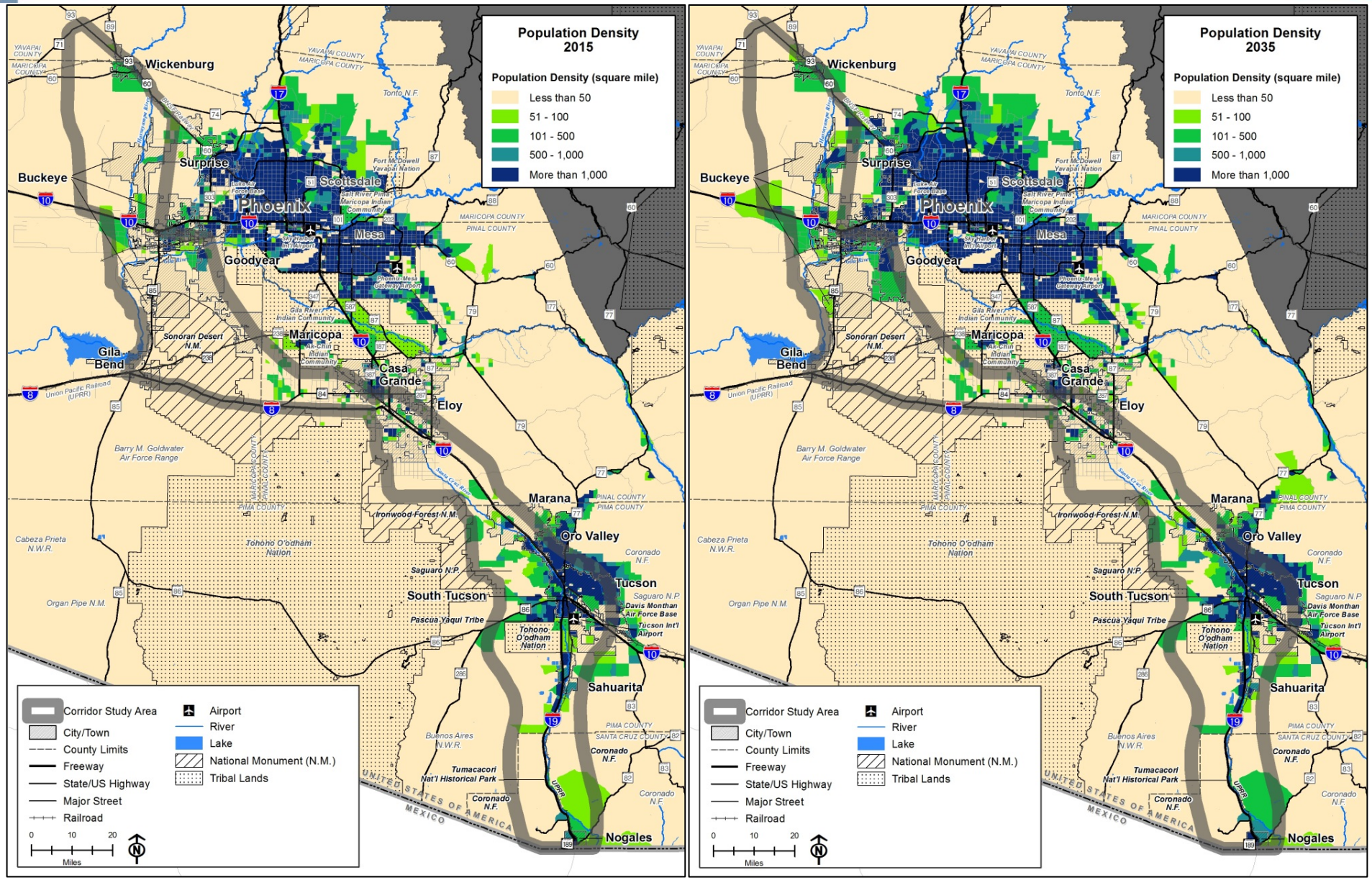

Figure 3-1 Population Densities, 2015 and 2035

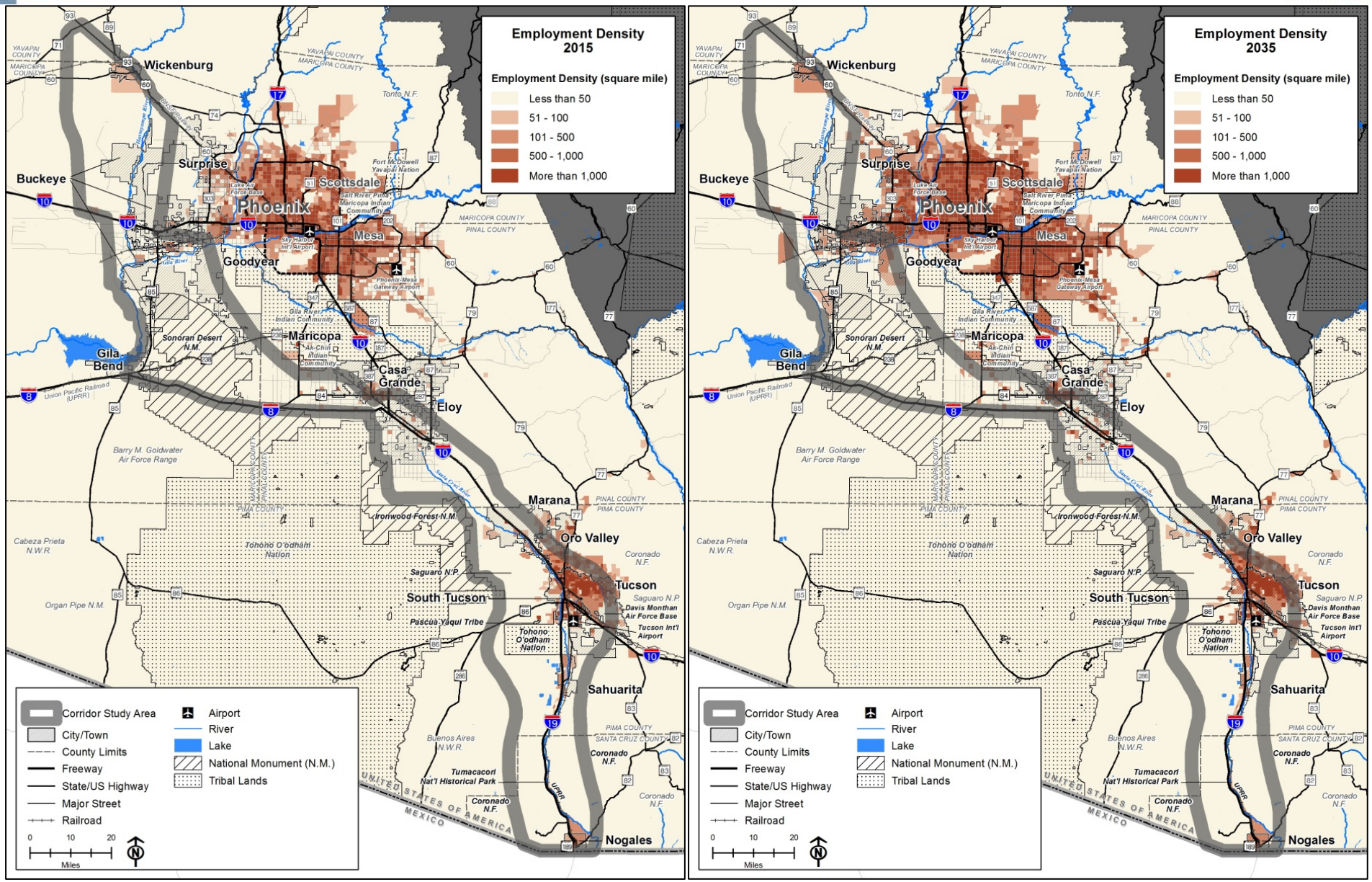

Figure 3-2 Employment Densities, 2015 and 2035

Table 3-1 Population and Employment Growth, 2015 to 2035

County	Population							
	County Totals				Within Corridor Study Area			
	2015	2035	Growth	% Growth	2015	2035	Growth	% Growth
Santa Cruz	49,500	67,300	+17,800	36%	46,100	62,800	+16,700	36%
Pima	1,007,300	1,277,300	+270,000	27%	819,000	1,038,500	+219,500	27%
Pinal	369,100	728,700	+359,600	97%	50,200	99,100	+48,900	97%
Maricopa	4,110,600	5,684,400	+1,573,800	38%	74,500	285,900	+211,400	284%
Yavapai	218,500	302,300	+3,800	38%	400	500	+100	25%
TOTAL	**5,755,000**	**8,060,000**	**+2,225,000**	**40%**	**990,200**	**1,486,800**	**+496,600**	**50%**
County	**Employment**							
	County Totals				**Within Corridor Study Area**			
	2015	**2035**	**Growth**	**% Growth**	**2015**	**2035**	**Growth**	**% Growth**
Santa Cruz	13,400	19,000	+5,600	42%	12,900	18,300	+5,400	42%
Pima	351,800	472,600	+120,800	34%	323,500	434,300	+110,800	34%
Pinal	54,000	244,100	+190,100	352%	13,000	57,500	+44,500	342%
Maricopa	1,732,600	2,636,800	+904,200	52%	11,000	46,200	+35,200	320%
Yavapai	57,200	83,700	+26,500	46%	20	30	+10	50%
TOTAL	**2,209,000**	**3,456,200**	**+1,247,200**	**56%**	**360,420**	**556,330**	**+195,910**	**54%**

SOURCE: Arizona Statewide Travel Demand Model, 2015.

The I-11 Corridor has been addressed in federal legislation, as well as statewide and regional planning documents to respond to projected growth and support more robust north-south trade (see **Section 2** [Background]). Congress identified the CANAMEX Trade Corridor as High Priority Corridor #26 in the 1995 National Highway System Designation Act. In Moving Ahead for Progress in the 21st Century Act (MAP-21) legislation, Congress confirmed the importance of CANAMEX by designating a 300-mile segment of it as a NHS High Priority Corridor from the Phoenix metropolitan area to the Las Vegas metropolitan area. Section 103 of MAP-21 states, "highways on the Interstate System shall be located so as to connect by routes, as direct as practicable, the principle metropolitan areas, cities, and industrial centers; to serve the national defense; and the maximum extent practicable, to connect at suitable border points with routes of continental importance in Canada and Mexico." (http://www.fhwa.dot.gov/MAP21/docs/title23usc.pdf)

Subsequently, the FAST Act applied the I-11 designation to the segment from the Phoenix metropolitan area south to the Arizona-Sonora border. The consideration of a proposed interstate freeway facility within the I-11 Corridor Study Area is also consistent with statewide and regional planning documents, including the *bqAZ Statewide Transportation Planning Framework Study (2010), PAG Regionally Significant Corridors Study* (2014), *Pinal Regional Transportation Plan* (2016), *Pinal County Regionally Significant Routes for Safety and Mobility* (2008), *I-10/Hassayampa Valley Transportation Framework Study* (2007), and *I-8 and I-10/Hidden Valley Transportation Framework Study* (2009).

3.3.2 Congestion and Travel Time Reliability

Current travel demand levels on the interstate freeway facilities within the I-11 Corridor Study Area impact congestion and travel time reliability during peak and non-peak periods, primarily due to unpredictable freeway conditions that impede travel flows (e.g., road restrictions or closures due to crashes, work zones, and isolated weather events like dust storms, flooding, etc.). Over the next 20 years, congestion and travel time reliability are expected to worsen (i.e., level of service D or lower) due to interstate freeway capacity demands resulting from population and employment growth. Levels of service (LOS) for freeways are defined in **Figure 3-3** (Levels of Service for Freeways), where freeway quality of service is graded using six letters "A" through "F" with LOS "A" being the best and LOS "F" being the worst.

Table 3-2 (Average Weekday Traffic and Level of Service, 2015 and 2035) provides LOS information for an average weekday between specific city pairs, and indicates that existing freeways within the I-11 Corridor Study Area were operating at LOS C or better in 2015. LOS C is generally considered to be a satisfactory level. By 2035, traffic operations on I-10 would deteriorate due to the increased travel demand in the I-11 Corridor Study Area. The segment of I-10 between Casa Grande and Phoenix is forecasted to operate at LOS D to F in 2035. The Tucson to Casa Grande segment would also experience an increase in average weekday traffic, with LOS ranging from D to F by 2035.

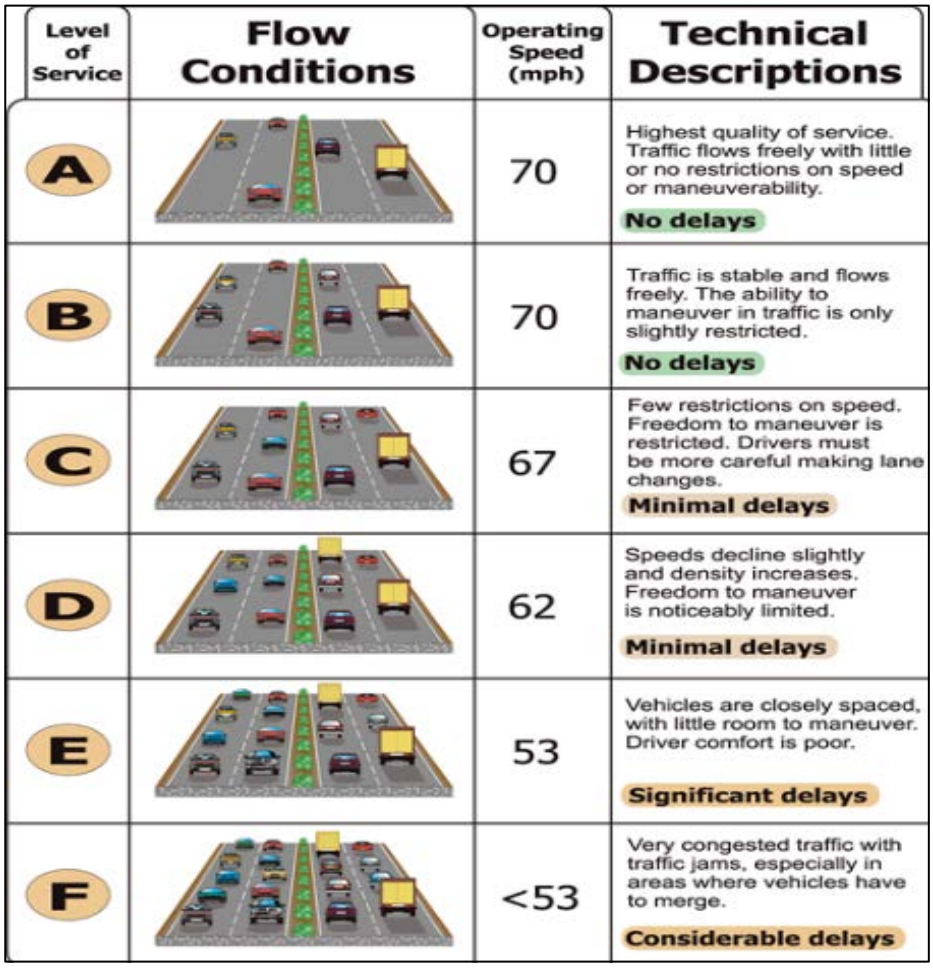

Figure 3-3 Levels of Service for Freeways

Table 3-2 Average Weekday Traffic and Level of Service, 2015 and 2035

Facility	City Pair	Lanes	Average Weekday Traffic (1)	Level of Service
2015				
I-19	Nogales – Tucson	4	18,800	A
I-10	Tucson – Casa Grande	4 to 6	59,700	B
I-8	Casa Grande – Gila Bend	4	7,500	A
I-10	Casa Grande – Phoenix (SR 202L)	4	56,100	C
SR 85	Gila Bend – I-10	4	14,200	A
2035				
I-19	Nogales – Tucson	4	32,600	A
I-10	Tucson – Casa Grande	4 to 6	86,000	D to F
I-8	Casa Grande – Gila Bend	4	10,300	A
I-10	Casa Grande – Phoenix (SR 202L)	4 to 6	95,400	D to F
SR 85	Gila Bend – I-10	4	23,900	A and E

SOURCES: Arizona Statewide Travel Demand Model, 2015 and Highway Capacity Manual, 2010.
NOTE: (1) March 2015 weekday traffic counts from ADOT Transportation Management System.

Figure 3-4 (Average Weekday Level of Service, 2035) shows future weekday LOS within the I-11 Corridor Study Area by 2035. Unacceptable LOS F is forecasted to occur throughout the I-10 corridor between Tucson and Phoenix, as well as between Phoenix and Buckeye. US 60 is also showing an unacceptable LOS F from Phoenix to Wickenburg.

Figure 3-5 (Peak Period Travel Time Ratings, 2016) shows the current 2016 travel time ratings for all traffic in the I-11 Corridor Study Area. This travel time index represents the ratio of the average peak period travel time to the free-flow travel time, representing recurring delay along the corridor that is ranked poor, fair, or good. Overall traffic mobility is affected by congestion concentrated in the Phoenix and Tucson urbanized areas, resulting in poor travel time ratings. On the southern end, I-19 experienced poor travel time ratings at the Mariposa LPOE due to heavy freight truck traffic and at milepost 25 because of the northbound inspection station. Poor travel times were also found at the junctions of I-19/I-10, I-10/I-8, I-8/SR84, I-8/SR85/SR238, and I-10/SR85.

Input from freight shippers and receivers to the *Arizona State Freight Plan* affirmed they are largely satisfied with the performance of the transportation system with the exception of recurring congestion and bottlenecks in urban centers—particularly in Phoenix and on I-10 between Phoenix and Tucson. Stakeholders indicated that for Arizona to maintain and enhance its competitiveness in this area it must develop policies and projects that maintain system reliability, either through measures that improve travel time reliability or provide capacity additions (ADOT 2015d).

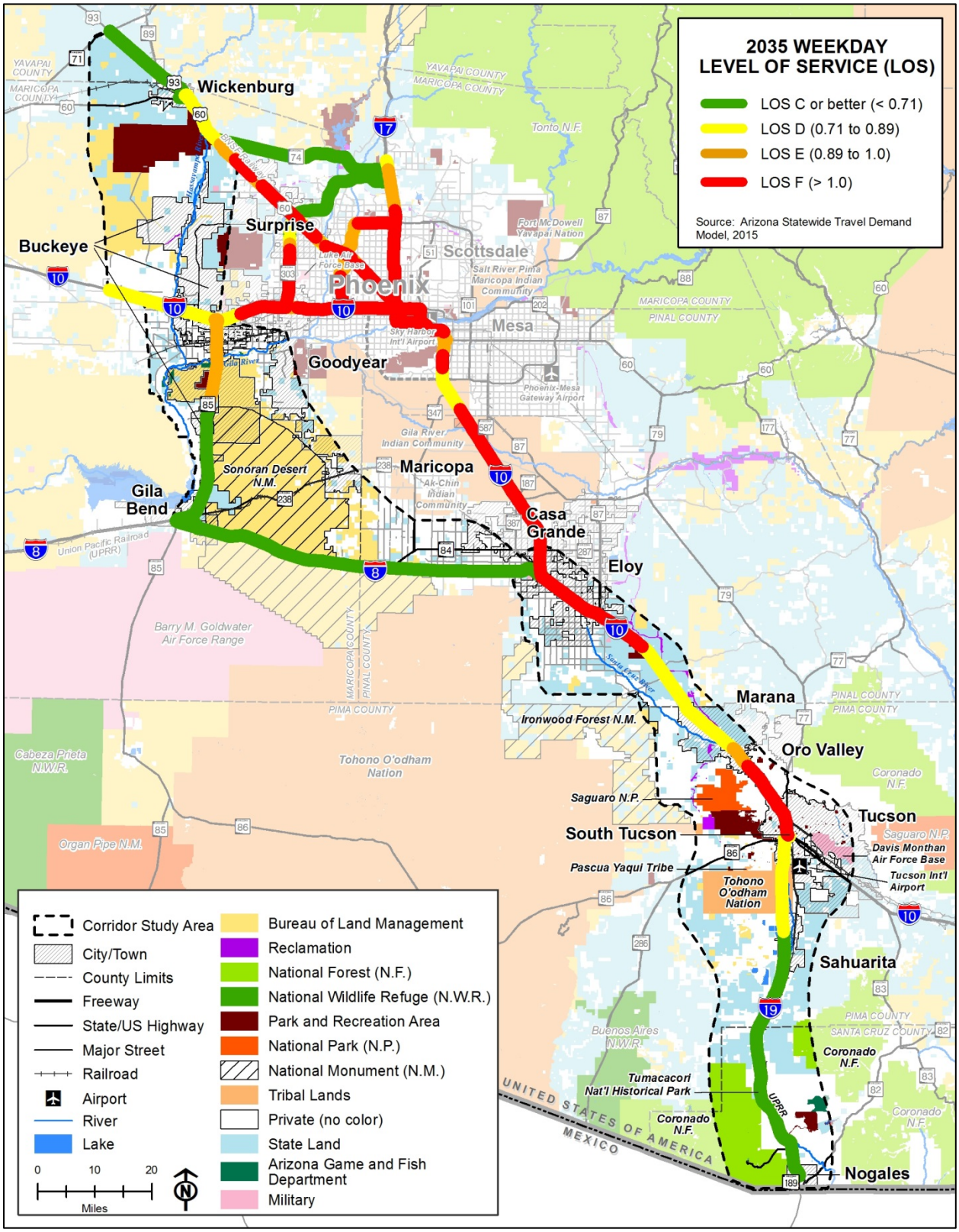

Figure 3-4 Average Weekday Level of Service, 2035

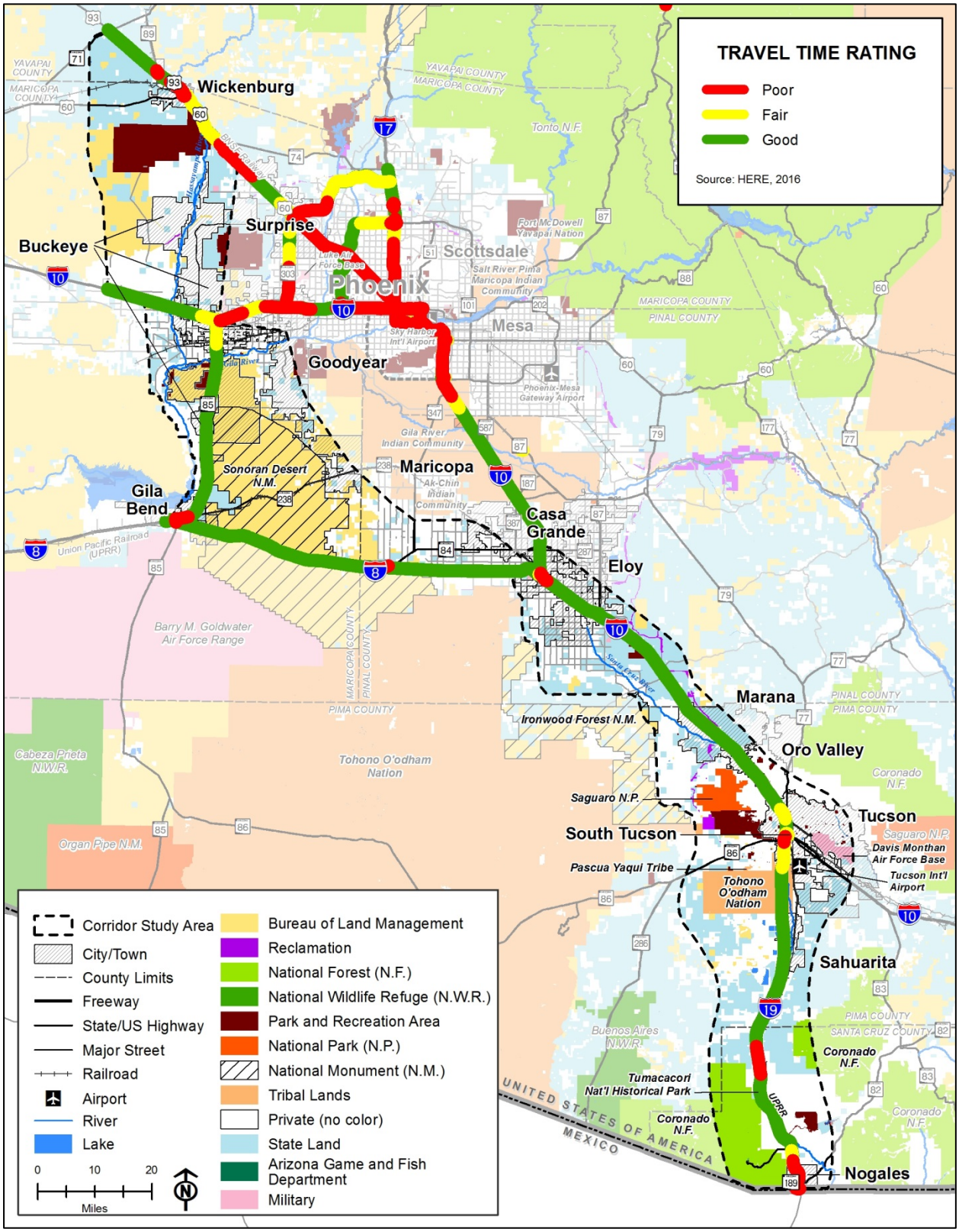

Figure 3-5 Peak Period Travel Time Ratings, 2016

A comparison of peak period travel times for various trips between Nogales to Wickenburg is shown in **Table 3-3** (Peak Period Travel Times from Nogales to Wickenburg in Evening, 2016 and 2035). Overall, travel times would increase up to approximately 90 minutes and average speeds would decrease by as much as 17 mph between Nogales and Wickenburg due to the growing congestion along existing freeways and arterials.

Table 3-3 Peak Period Travel Times from Nogales to Wickenburg in Evening, 2016 and 2035

Trips Between Nogales and Wickenburg [1]	Northbound			Southbound		
	Distance (miles)	Travel Time [2] (minutes)	Average Speed (mph)	Distance (miles)	Travel Time [1] (minutes)	Average Speed (mph)
2016						
I-19/I-10/I-17/SR 74/US 60/US 93	244	235	62	244	240	61
I-19/I-10/US 60/US 93	232	240	58	232	260	54
I-19/I-10/I-8/SR 85/I-10/SR 303/US 60/US 93	275	250	66	275	250	66
I-19/I-10/L101/US 60/US 93	238	235	61	238	250	57
I-19/I-10/L303/US 60/US 93	243	230	63	243	240	61
2035						
I-19/I-10/I-17/SR 74/US 60/US 93	244	319	46	244	330	44
I-19/I-10/US 60/US 93	232	329	43	232	340	41
I-19/I-10/I-8/SR 85/I-10/SR 303/US 60/US 93	275	317	52	275	326	51
I-19/I-10/L202/I-10/ L101/US 60/US 93 [3]	238	294	49	238	323	45
I-19/I-10/L202/I-10/ L303/US 60/US 93 [3]	243	288	51	243	316	47
I-19/I-10/L101/US 60/US 93	238	326	44	238	338	42
I-19/I-10/L303/US 60/US 93	243	320	46	243	330	44

SOURCE: Google Maps, 2016.
NOTES:
(1) LOS, travel time rating, and safety index are shown for these trips on Figure 3-4, Figure 3-5, and Figure 3-7, respectively; however, travel time rating data are not available along SR 74.
(2) Travel times based on Google estimates for a 4 p.m. departure on March 15, 2016.
(3) Reflects 2035 travel times for a route that includes the South Mountain Freeway (L202), not built in 2016.

A closer look at the travel times between cities within the I-11 Corridor Study Area is shown in **Table 3-4** (Peak Period Travel Times in Evening, 2016 and 2035), affirming that travel times would continue to worsen over the 20-year period. The slowest 2016 peak period travel speeds were between Casa Grande and Phoenix in the evening, with average speeds of 43 mph heading northbound and 38 mph southbound. Future travel times show the slowest 2035 peak period travel speeds would occur between Casa Grande and Phoenix, with average speeds at 37 mph heading northbound and 34 mph southbound. Southbound trips between Phoenix and Wickenburg show the greatest decline from 57 mph in 2016 to 41 mph in 2035, with the northbound average speed being the slowest in the study area at 31 mph in 2035.

Table 3-4 Peak Period Travel Times for City Pairs in Evening, 2016 and 2035

City Pair	Northbound			Southbound		
	Distance (miles)	Travel Time (minutes)	Average Speed (mph)	Distance (miles)	Travel Time (minutes)	Average Speed (mph)
2016						
Nogales – Tucson	66	68	58	66	68	58
Tucson – Casa Grande	66	68	58	66	65	61
Casa Grande – Phoenix	50	70	43	50	80	38
Phoenix – Wickenburg	65	85	46	65	68	57
Casa Grande – Wickenburg	116	145	48	114	140	50
2035						
Nogales – Tucson	66	68	58	66	68	58
Tucson – Casa Grande	66	85	47	66	80	50
Casa Grande – Phoenix	52	84	37	53	93	34
Phoenix – Wickenburg	87	168	31	67	126	41
Casa Grande – Wickenburg	146	186	47	142	178	49

SOURCE: Google Maps, 2016.
NOTE: Travel times based on Google estimates for a 4 p.m. departure on March 15, 2016.

Based on the existing roadway network, the travel time between Casa Grande and Wickenburg through the Phoenix metropolitan core would substantially increase between 2015 and 2035. Due to congestion in the Phoenix metropolitan core, trips between Casa Grande and Wickenburg may divert west to faster alternative routes such as on I-8, SR 85, and other existing arterials within the I-11 Corridor Study Area. **Figure 3-6** (Peak Period Average Travel Speeds in Evening, 2015 and 2035) illustrates potential travel paths and speeds now and into the future. This illustration shows that longer alternate routes to the west using I-8, SR 85, Sun Valley Parkway, and Vulture Mine Road would have faster speeds resulting in shorter travel times than more direct routes through the Phoenix metropolitan core.

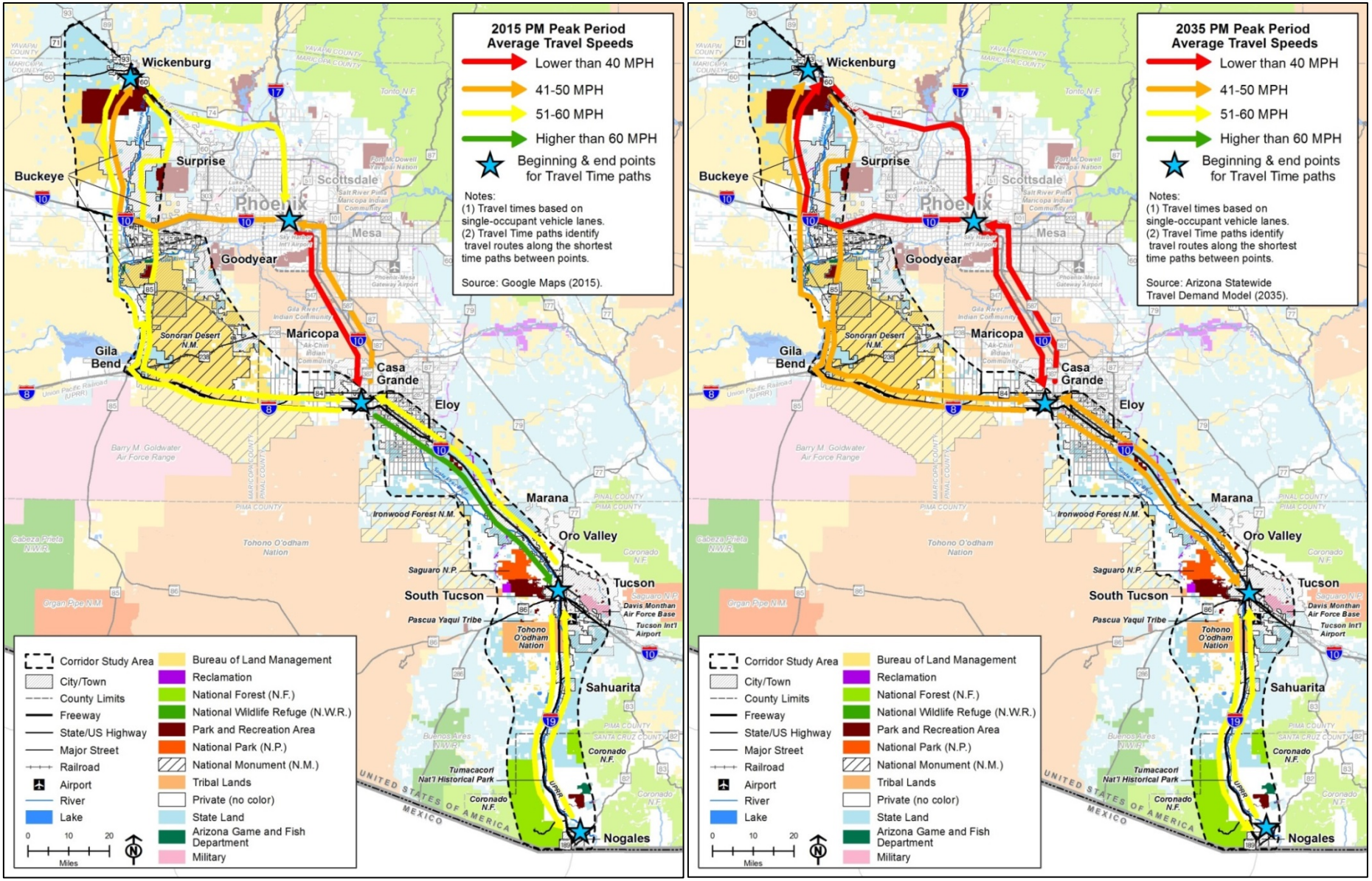

Figure 3-6 Peak Period Travel Speeds in Evening, 2015 and 2035

Freeways in the I-11 Corridor Study Area are subject to periodic bottlenecks, primarily due to unpredictable freeway conditions that impede travel flows (e.g., road restrictions or closures due to crashes, work zones, and isolated weather events like dust storms, flooding, etc.) and the lack of alternative routes in most locations. **Figure 3-7** (Safety Index, 2014) shows that freeways and state highways in the I-11 Corridor Study Area have safety ratings either below or slightly below the state average. The safety index combines the bi-directional frequency and rate of fatal and incapacitating injury crashes compared to crash occurrences on similar roadways in Arizona, and ranks them above average, slightly above average or below average.

Crash hot spot locations along the I-11 Corridor Study Area with slightly above or above average include:

- I-19 in Santa Cruz County – slightly above average
- I-19 and I-10 in Tucson – slightly above to above average
- I-10 near Eloy – slightly above average
- I-8 west of Casa Grande – slightly above average
- I-8, SR 85, and SR 238 near Gila Bend – slightly above average
- All areas approaching or within Phoenix metropolitan core – slightly above to above average
- SR 85 south of I-10 in Buckeye – slightly above to above average
- US 60 and US 93 to US 71 near Wickenburg – slightly above to above average.

Crashes at these hot spots and elsewhere in the corridor contribute to non-recurring delays for movement of people and goods. This creates unpredictable congestion levels and travel times along the I-11 Corridor Study Area.

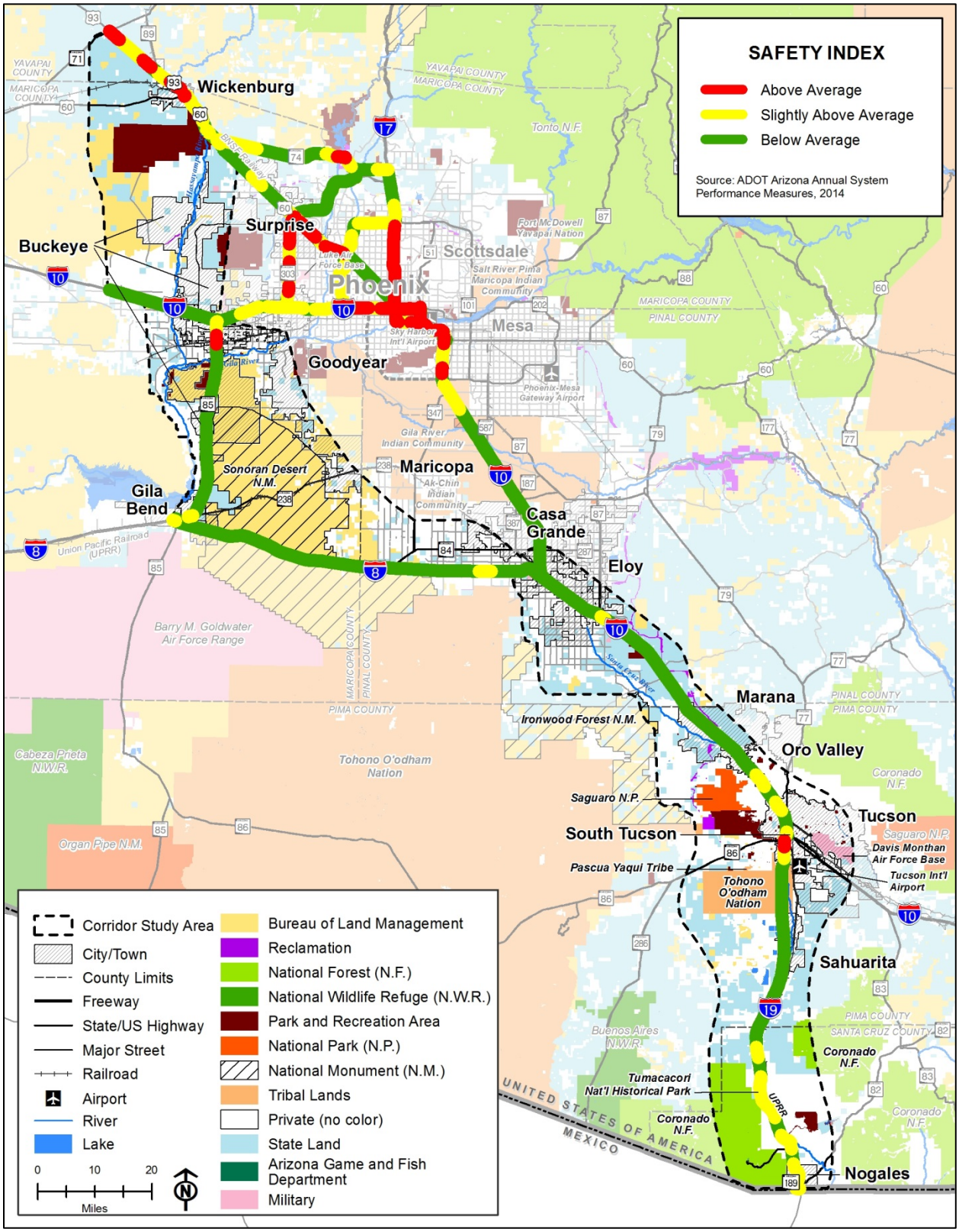

Figure 3-7 Safety Index, 2014

3.3.3 System Linkages and Regional and Interstate Mobility

The lack of an improved north-south interstate freeway link in the Intermountain West region to enhance trade, economic development, efficient mobility, and provide an alternative route for freight movement is so vital that Congress designated I-11 as a High Priority Corridor (ADOT 2014). As noted above, federal legislation had previously defined CANAMEX as a key trade corridor to support the nation's economy, defense, and mobility. **Figure 3-8** (FHWA High Priority Corridors in the Western US) illustrates the designated High Priority Corridors relative to the I-11 Corridor Study Area.

Figure 3-8 FHWA High Priority Corridors in the Western US

Future trade patterns may be further affected by several factors such as the growth of nearshoring, the implementation of Arizona economic initiatives, and changes in port infrastructure. Nearshoring refers to the trend of moving manufactured goods production to Mexico from Asia Pacific (NDOT and ADOT 2013). The increasing importance of Mexico as a trading partner, emergence of nearshoring as a strongly growing structural feature of US commerce, and continuation of historic growth in the region all suggest that demands on the Intermountain West region's interstate freeway infrastructure will substantially increase during the next few decades.

The I-11 Corridor Study Area would connect the Intermountain West's largest manufacturing and economic activity centers to support regional, national, and international trade, as shown on **Figure 3-9** (Southwest Manufacturing). The high levels of congestion in southern California suggest that a high-quality, north-south corridor in the Intermountain West has the potential to become the corridor of choice for trade-related traffic to and from Mexico, particularly as the nearshoring phenomenon is expected to increase. With the desire for supply chain reliability to support "just-in-time" delivery in integrated manufacturing and distribution systems, a corridor in the Intermountain West becomes more attractive (NDOT and ADOT 2013).

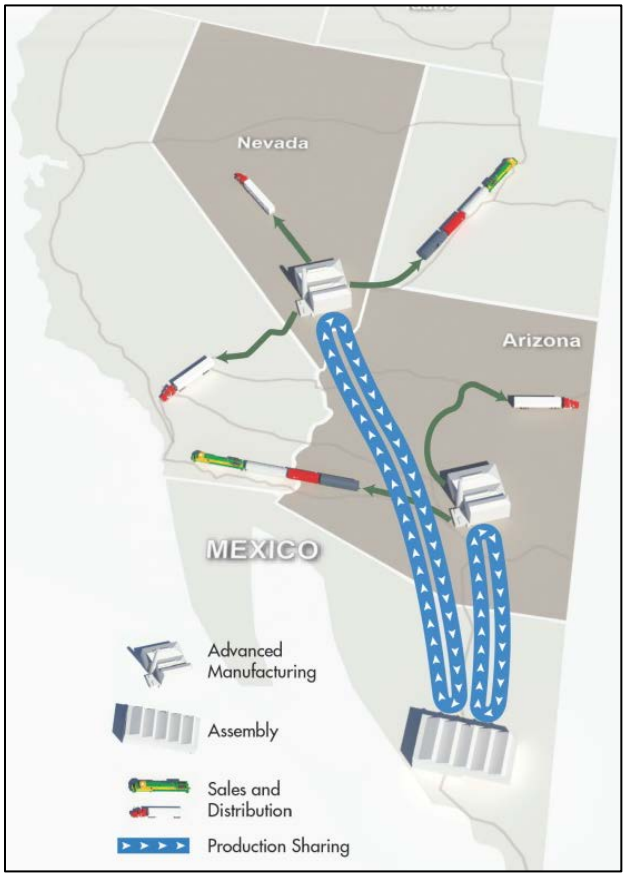

Figure 3-9 Southwest Manufacturing

Economic development initiatives underway in Arizona are focused on selected target clusters in aerospace, life sciences, and other high-value manufactured goods, which rely on high-quality interstate freeway corridors for mobility of raw materials, finished products, and workers. The success of state economic development initiatives will depend on continuing transportation

investment to maintain competitiveness. Worsened congestion and poor travel time reliability on the interstate freeway system would adversely affect economic competitiveness.

Alternatives to the ports of Los Angeles and Long Beach and the increasingly congested north-south interstate freeways in California may stimulate demand for additional north-south routes such as the I-11 Corridor to accommodate the movement of freight. The ports of Los Angeles and Long Beach are the primary gateways of manufactured goods from the Asian markets and are the busiest ports in the US. As such, the Mexican ports, namely the Port of Guaymas depicted on **Figure 3-9** (Southwest Manufacturing) as an "Assembly" location, are expected to become a reliever for foreign goods to enter and exit North American markets. These Mexican ports will also have an advantage because expansions at Los Angeles/Long Beach are constrained by adjacent urban development.

Table 3-5 (State-to-State Daily Freight Truck Flows, 2013 and 2035) shows the state-to-state freight truck flows that have the potential to use the I-11 Corridor. Export cargo values from Arizona to Mexico are forecasted to more than triple through 2035. The Arizona to Nevada market is also fast growing, with a projected increase of 175 percent in daily freight truck units between 2013 and 2035.

Table 3-5 State-to-State Daily Freight Truck Flows, 2013 and 2035

State Pair	Cargo Value (1,000s) [1]			Daily Freight Truck Units [1]		
	2013	2035	% Change	2013	2035	% Change
Arizona – Mexico	$13,271	$58,205	339%	130	460	254%
Arizona – Nevada	$10,521	$24,390	132%	680	1,870	175%
Arizona – Idaho	$2,610	$15,828	506%	100	220	120%
Arizona – Canada	$2,088	$7,626	265%	40	130	225%
Nevada – Mexico	$543	$3,060	463%	3	13	333%
Idaho – Mexico	$35	$134	283%	2	6	200%

SOURCE: Transearch, 2013.
NOTE: (1) Annual flows converted to daily estimates by assuming 300 days per year.

Table 3-6 (County-to-County Daily Freight Truck Flows, 2013 and 2035) presents the freight movements carried by trucks between the counties within the I-11 Corridor Study Area from 2013 to 2035. The greatest percentage increase is expected to occur between Santa Cruz and Pima counties, with a growth of 204 percent in daily freight truck units by 2035. County-to-county daily freight truck flows are also projected to double between Pinal and Maricopa counties over that same time period.

Table 3-6 County-to-County Daily Freight Truck Flows, 2013 and 2035

County Pair	Cargo Value (1,000s) [1]			Daily Truck Units [1]		
	2013	2035	% Change	2013	2035	% Change
Santa Cruz – Pima	$407	$877	115%	80	243	204%
Santa Cruz – Maricopa	$156	$340	118%	10	25	150%
Pima – Pinal	$1,136	$2,636	132%	590	960	63%
Pima – Maricopa	$13,369	$26,875	101%	940	1,570	67%
Pinal – Maricopa	$7,353	$12,506	70%	3,130	6,250	100%
Maricopa – Yavapai	$1,987	$4,925	148%	360	500	39%

SOURCE: Transearch, 2013.
NOTE: (1) Annual flows converted to daily estimates by assuming 300 days per year.

3.3.4 Access to Economic Activity Centers

Various transportation studies, plans, and other reports conducted within the I-11 Corridor Study Area express strong support for commerce and business by connecting people to employment hubs, economic activity centers, and tourist attractions. Communities within the I-11 Corridor Study Area have identified various goals and initiatives in support of a proposed interstate freeway facility to enhance access to economic development opportunities and support job creation. The communities are largely focused on aerospace, advanced manufacturing, and transportation/logistics industries, all of which require easy and safe access to employees, suppliers, and markets.

In 2015, the I-11 Corridor Study Area contained approximately 360,420 jobs, which comprised 15 percent of all employment in Arizona; this share is projected to grow to 23 percent of the state's employment by 2035. Nogales, Tucson, Casa Grande, Goodyear, Buckeye, and Wickenburg are expected to contribute to this employment growth, with an increase of 50 to 100 jobs per square mile between 2015 and 2035. **Figure 3-10** (Economic Centers and Employment Densities, 2035) shows the high job concentrations (i.e., more than 150 jobs per square mile) within the I-11 Corridor Study Area in 2035.

Agriculture, manufacturing, and mining were the leading economic sectors within the I-11 Corridor Study Area in 2015. However, a greater percentage of employment is expected in construction, health services, retail, and wholesale trade by 2035; manufacturing jobs are also projected to grow by 23 percent. Pima County would add more than 110,800 of those jobs. Yet, Pinal County would have the highest employment growth within the I-11 Corridor Study Area at 342 percent (+44,500), with Maricopa County close behind at a 320 percent (+35,200) increase in jobs by 2035.

A high capacity transportation facility would facilitate improved access and connectivity to major employment areas, economic development opportunities, warehouse/distribution facilities, and airports. Several economic development projects are located within the I-11 Corridor Study Area that would benefit from improved interstate freeway access, as shown on **Figure 3-10** (Economic Centers and Employment Densities, 2035). Examples of these existing and emerging economic centers within the I-11 Corridor Study Area include, but are not limited to:

- **Mariposa International Commerce/Industry Park Area:** Employment center, Industrial parks, and distribution facilities near the Mariposa LPOE, which is the third largest international border in the US.

- **Sonoran Corridor:** Planned 50-square mile import/export logistics hub area that includes aviation and defense-related uses (e.g., Raytheon Missile Systems, Davis-Monthan Air Force Base, Tucson International Airport, University of Arizona Tech Park, etc.).
- **Port of Tucson:** An intermodal freight facility southeast of Tucson, adjacent to I-10 and UPRR mainline, fulfilling both domestic and international shipments.
- **Downtown Tucson**: Primary employment center in the Tucson metropolitan area, located along I-10 north of the I-10/I-19 junction. Includes a mix of employment types, including office, commercial, institutional, and industrial, combined with residential and other mixed uses.
- **Tangerine Road Corridor:** Planned activity center targeted for high-tech business park development, with surrounding residential and commercial mixed use development.
- **Transportation Logistics Zone:** Area encompassing the Pinal Airpark, I-10, UPRR, and planned rail system improvements.
- **UPRR Red Rock Classification Yard:** Major rail yard proposed by UPRR to serve its Sunset Limited mainline corridor approximately 35 miles north of Tucson; intended to be one of the largest logistics centers in the western US.
- **Phoenix Mart:** Mixed use development and proposed global trade center in Casa Grande that would be an international exposition center similar to the Merchandise Mart in Chicago, with numerous business and showroom suites as well as facilities to conduct major events.
- **Casa Grande Commerce Park**: Employment area, consisting of nearly 600 acres.
- **Coolidge Inland Port and Pinal Logistics Park**: A planned 1,600-acre inland port on the eastern edge of the proposed North-South Freeway.
- **Commerce and Business Corridor:** Linear economic growth areas in Casa Grande focused on commerce and business development along I-10 and I-8.
- **Manufacturing Cluster:** Planned manufacturing/industrial growth cluster in Casa Grande along the UPRR corridor and near future expressway corridors.
- **Industrial Cluster:** Planned industrial growth cluster in southern Goodyear near the junction of SR 238/UPRR corridor and the Sonoran Valley Parkway corridor.
- **Phoenix-Goodyear Airport:** Planned growth area of warehouse, distribution, and manufacturing development focused around the Phoenix-Goodyear Airport area.
- **Loop 303/I-10 Job Corridor:** Planned growth area of business and commerce-oriented development along the I-10 and SR 303L corridors in Goodyear.
- **Buckeye Industrial Corridor:** Over 16 miles of industrial and business park property supporting both domestic and international business, oriented around the Buckeye Municipal Airport.
- **Liberty Area:** Business park development focus in eastern Buckeye between the UPRR Phoenix Subdivision and planned SR 801 freeway corridor.
- **Belmont:** A 20,800-acre master planned community north of I-10 in Buckeye, with approximately 72,800 residential units and 2,100 acres of commercial and employment use.
- **Douglas Ranch:** A 33,800-acre master planned community approximately 40 miles north of I-10 in Buckeye, with over 104,000 residential units and 55 million square feet of business and commercial use.

- **Forepaugh Industrial Rail Park:** A 76-acre industrial park approximately 10 miles west of Wickenburg that is planned for over 700 acres of light and heavy industrial uses that would serve as a transportation distribution center.

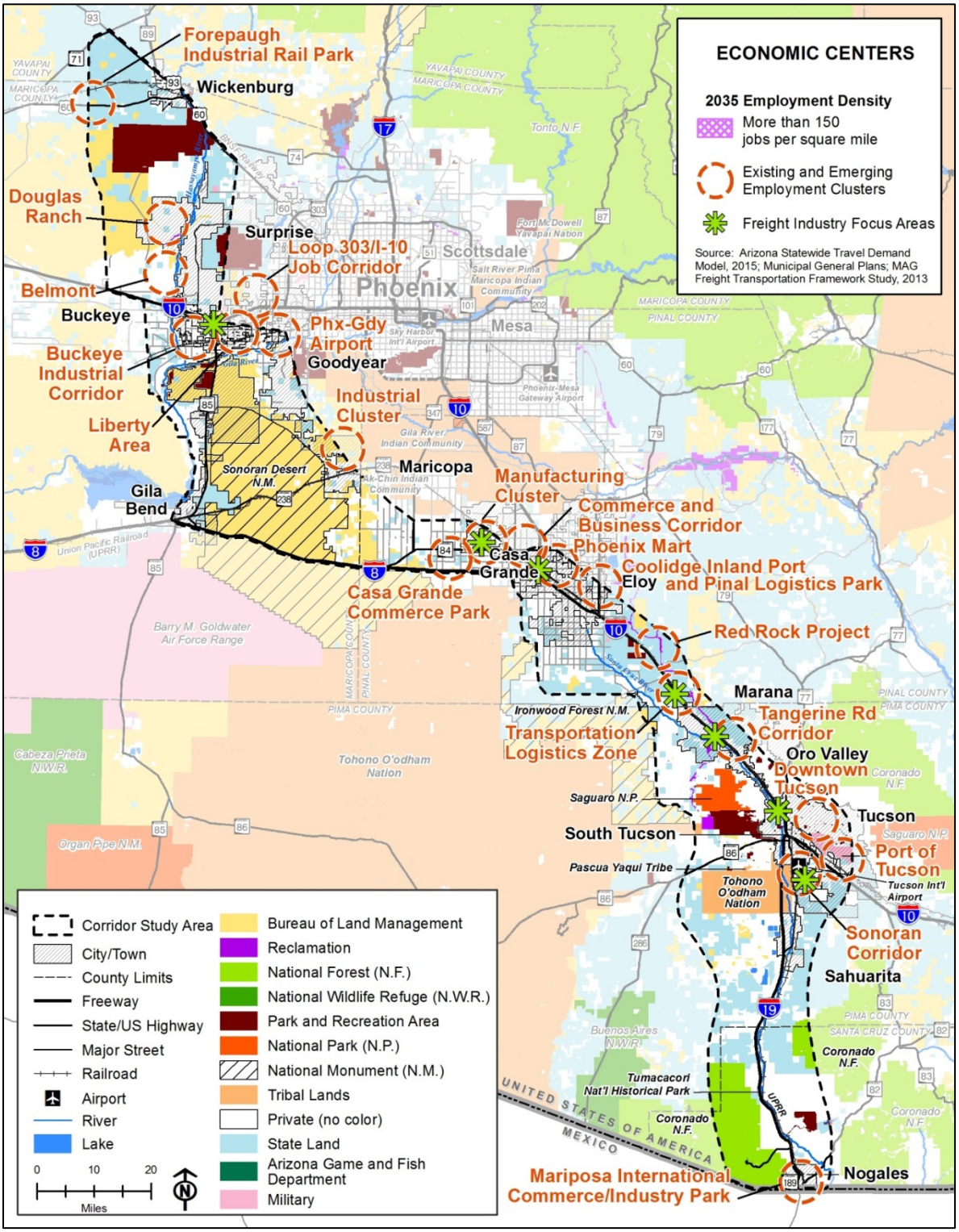

Figure 3-10 Economic Centers and Employment Densities, 2035

Additionally, tourism attracts out-of-state and international visitors. Many tourist destinations are found within the I-11 Corridor Study Area and include parks, outdoor recreational areas, and cultural destinations. Notable tourist attractions within and along the I-11 Corridor Study Area include, but are not limited to:

- Coronado National Forest
- Tumacacori National Historical Park
- Tubac Presidio State Historic Park
- Mission San Xavier del Bac
- Tucson Mountain Park
- Saguaro National Park
- Ironwood Forest National Monument
- Picacho Peak State Park
- DeAnza Historic Trail
- Casa Grande National Monument
- Sonoran Desert National Monument
- Sky Line Regional Park
- White Tank Mountain Regional Park
- Proposed Vulture Mountains Recreation Area

These attractions are depicted on **Figure 3-11** (Notable Tourist Attractions). The interstate freeway system plays a critical role in providing access to these attractions and supporting tourism, which is one of the most important industries driving Arizona's economy. In 2015, out-of-state visitors generated more than 75 percent of overall tourism spending within the state, of which 16 percent was from international visitors including day trips from Mexico (Dean Runyan Associates 2016).

An historical rise in international tourists has caused an increase in traffic that has put pressure on transportation facilities nationally as well as in Arizona (Mammadov 2012). In 2015, Arizona had 36.4 million domestic visitors and 5.7 million international visitors. Mexican visitors comprised 3.7 million or 67 percent of all international visitors and spent approximately $7.3 million a day in Arizona (Border Communities Roadmap 2013). Since 2010, Mexican visitation to Arizona has increased 15 percent. About 65 percent of the Mexican visitors spent their time in Tucson and southern Arizona, while 28 percent visited Phoenix and the central part of the state.

3.3.5 Homeland Security and National Defense

The original interstate freeway system was planned in part as a primary and necessary element of the national defense system. One of the original purposes of the system was to provide ground transportation for military supplies and troop deployments. The I-11 Corridor may be an additional element of the Strategic Highway Network (STRAHNET), which is designated by the FHWA. The network is intended to provide defense access, continuity, and emergency capabilities for movement of personnel and equipment in both peace and war.

Congestion levels on I-10 and other existing interstate freeways and state routes would inhibit efficient and safe evacuation procedures and defense access. The provision of potential alternative interstate freeway routes would help to alleviate this congestion and establish sound emergency capabilities. The presence of the Palo Verde Nuclear Generating Station within the I-11 Corridor Study Area supports the need for an improved interstate freeway system with potential alternative routes in the case of an emergency situation requiring evacuation. Further,

the military facilities in the Phoenix and Tucson areas would benefit from alternative and adequate interstate freeway routes to effectively transport personnel and equipment.

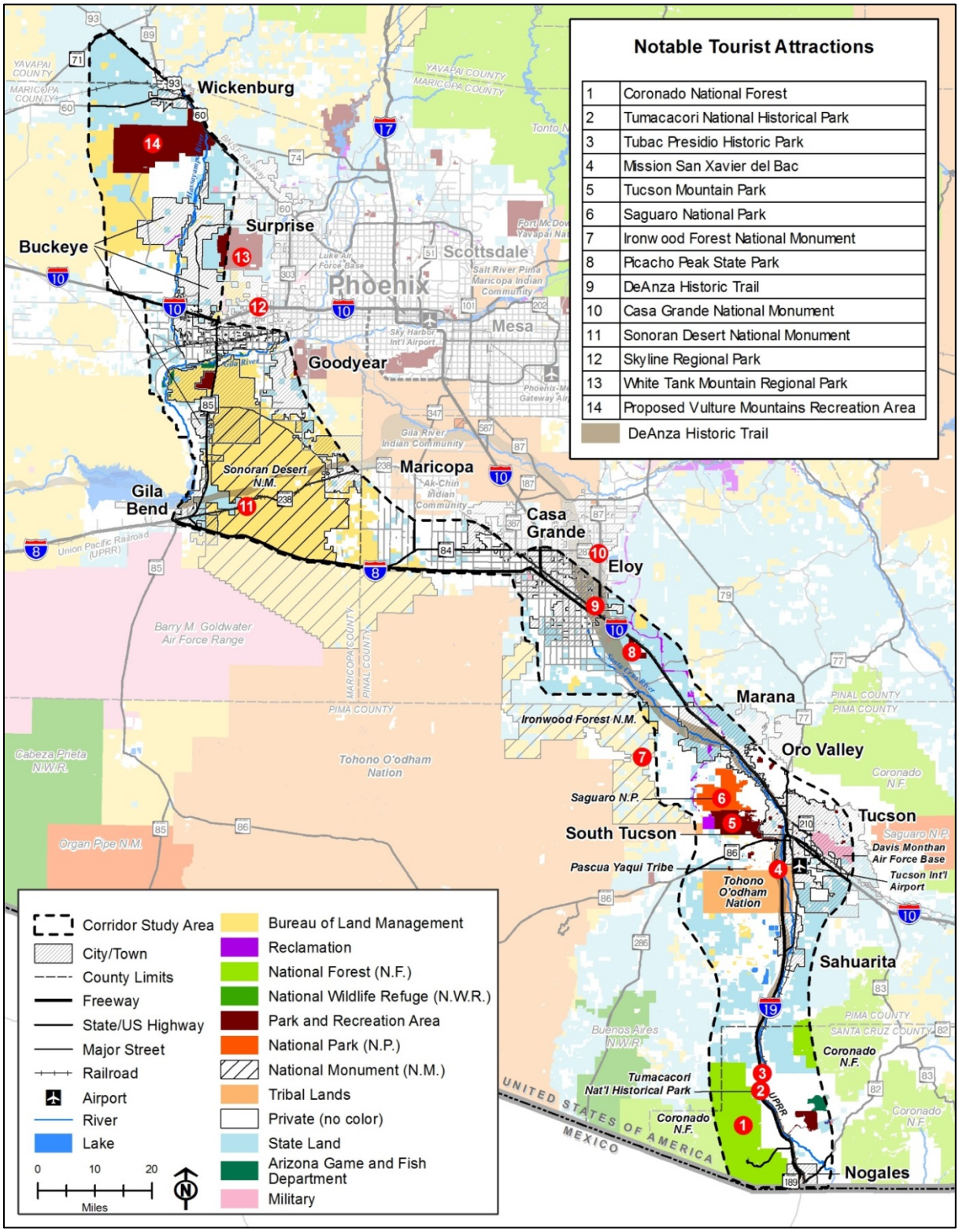

Figure 3-11 Notable Tourist Attractions

4 SUMMARY AND NEXT STEPS

The I-11 Corridor is intended to provide a High Priority, high capacity, access-controlled transportation facility; support improved regional mobility for people, goods, and homeland security; connect important metropolitan areas and markets in the Intermountain West with Mexico and Canada; and enhance access to support economic vitality. The needs associated with a proposed transportation facility within the I-11 Corridor Study Area include responding to projected population and employment growth; improving congestion levels and travel time reliability; creating system linkages to promote regional and interstate mobility; providing interstate freeway access to economic activity centers; and providing a more robust interstate freeway network to support homeland security and national defense.

In summary, the key factors that support the need for a transportation facility in the I-11 Corridor Study Area include:

- Population and employment growth would contribute to unacceptable levels of service by 2035;
- Periodic bottlenecks due to unexpected freeway conditions (e.g., crashes, work zones, and isolated weather events) and lack of alternative routes generate unpredictable congestion levels and travel time reliability for movement of people and goods;
- Increased congestion within the Phoenix metropolitan core would divert trips west to faster alternate routes within the I-11 Corridor Study Area in 2035;
- System linkage gaps would inhibit regional and interstate mobility due to projected increasing congestion on other north-south freight corridors, increased trade flows with Mexico, and growth in regional vehicular and freight trips by 2035;
- Substantial employment growth and emerging economic activity centers would require improved interstate freeway access and connectivity; and
- A transportation facility would provide improved access to tourist attractions and support domestic and international tourism, which is one of the most important industries driving Arizona's economy; and
- Expansion of STRAHNET and other strategic initiatives could strengthen the interstate freeway network to provide more robust alternative routes for emergency capabilities and defense access.

4.1 Alternatives Selection Report

The Purpose and Need will guide the development of a comprehensive range of corridor alternatives for consideration during the ASR. The corridor alternatives will be evaluated and screened based on an ASR methodology and criteria that will be reviewed by the Cooperating and Participating Agencies, including consistency with Purpose and Need. Potential evaluation and screening criteria could include connectivity, economic vitality, congestion and capacity, engineering constraints, environmental, community acceptance, and other potential considerations. The screening will enable the FHWA and ADOT to eliminate corridor alternatives that are not feasible or prudent, as well as to refine and further consider corridor alternatives that are most likely to best meet the overall Purpose and Need of the I-11 Corridor. Ultimately, the screening process will yield a reasonable range of Build Corridor Alternatives and a No Build Alternative (i.e., do-nothing option) that will advance into the Draft Tier 1 EIS document for a programmatic-level environmental review.

4.2 Draft Tier 1 EIS

The FHWA and ADOT will prepare a Draft Tier 1 EIS to more fully assess the reasonable range of Build Corridor Alternatives and No Build Alternative that emerge from the ASR. The Draft Tier 1 EIS will:

- Identify the Purpose and Need for the I-11 Corridor;
- Describe the screening process and each of the Build Corridor Alternatives for a proposed interstate freeway facility;
- Evaluate the affected environment and potential environmental impacts based on agreed upon assessment methodologies for the environmental resource areas;
- Identify the Preferred Corridor Alternative that best meets the Purpose and Need; and
- Provide opportunities for the public, agencies, and tribal communities to review and comment on the I-11 Corridor Tier 1 EIS.

The Draft Tier 1 EIS document will be circulated for public and agency comment over a 45-day review period. During this time, hearings will be held to present the results of the Draft Tier 1 EIS and formally record all comments received.

4.3 Final Tier 1 EIS and Record of Decision

The FHWA and ADOT will complete the environmental review process with the preparation of a combined Final Tier 1 EIS and ROD. After consideration of comments received, and if a Build Alternative is selected, the FHWA will issue the combined Final Tier 1 EIS and ROD document pursuant to MAP-21 and the FAST Act, unless the FHWA determines that statutory criteria or practicability considerations preclude a combined document.

The combined Final Tier 1 EIS and ROD will document a Selected Corridor Alternative (Build or No Build); present the basis for the decision; describe the alternatives considered; and provide strategies to avoid, minimize, and compensate for environmental impacts. The FHWA will ultimately approve the Final Tier 1 EIS and ROD as the Federal Lead Agency under NEPA.

The primary goal of the study process is to determine what the Selected Corridor Alternative will be, either a Build Alternative (2,000 feet in width) or the No Build Alternative. If a Build Alternative is selected, the Tier 1 EIS document would include information on:

- Potential social, economic, and natural environmental impacts;
- 2,000-foot-wide corridor for a proposed interstate freeway facility; and
- Proposed projects for Phased Implementation Plan.

The Tier 1 EIS will provide a roadmap for advancing the PIP projects to the next phase – called Tier 2 environmental review. In a tiered process, Tier 2 would be similar to a traditional project-level NEPA review. During the future Tier 2 environmental reviews, ADOT and FHWA will conduct detailed environmental and engineering studies for the proposed projects within the 2,000-foot-wide Selected Corridor Alternative, as illustrated on **Figure 4-1** (Corridor Alternatives Development and Environmental Review Process).

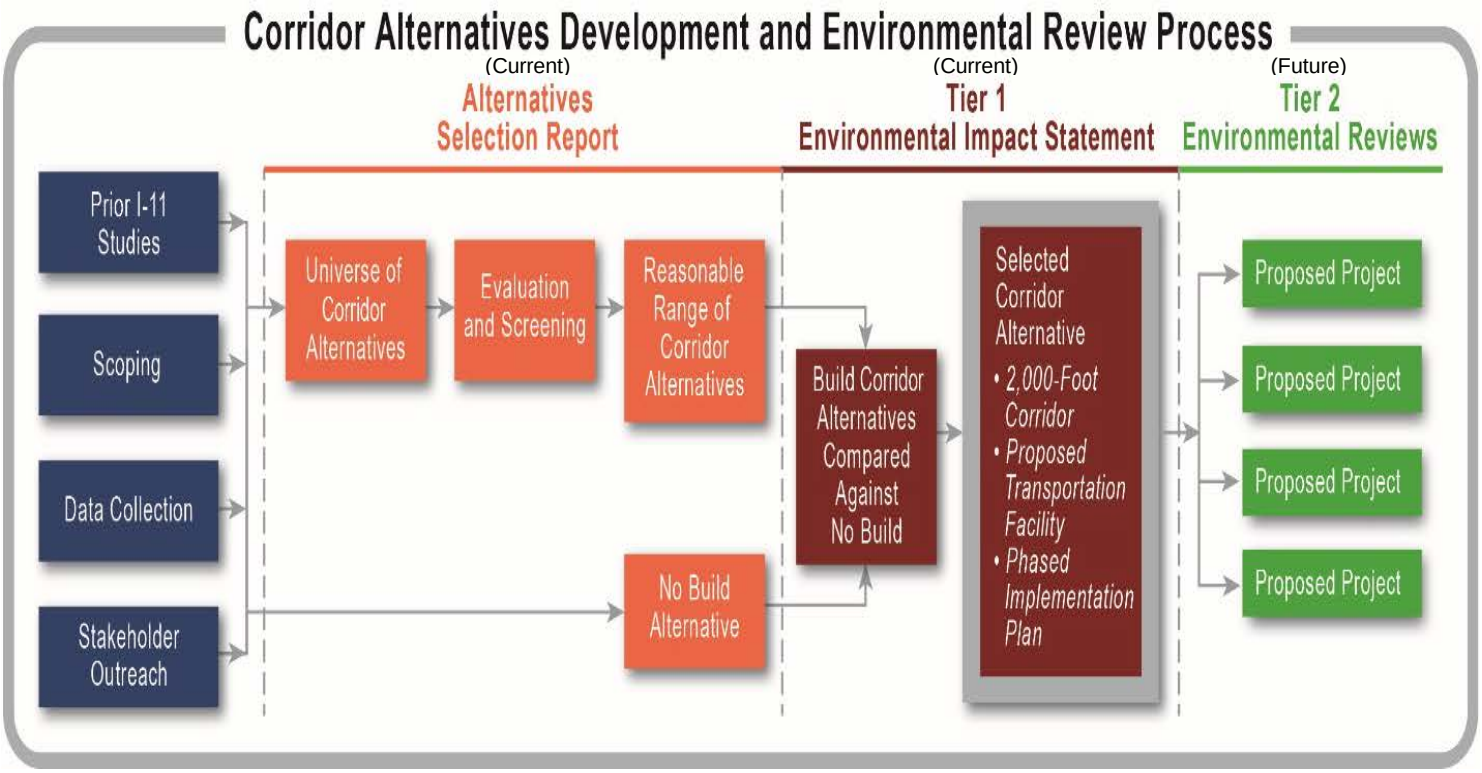

Figure 4-1 Corridor Alternatives Development and Environmental Review Process

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