3 Affected Environment and Environmental Consequences

This chapter describes the proposed action's potential impacts on the natural, human, and built environments. Each section describes the regulatory context governing the analysis and the methodology for assessing impacts. The existing environmental conditions are described, followed by a discussion of the environmental consequences of building and operating the proposed action. Strategies for avoiding, minimizing, or mitigating potential adverse impacts are described, and an overview of subsequent Tier 2 studies is provided. Appendix D, *Summary of Avoidance, Minimization, and Mitigation Strategies*, contains a consolidated list of strategies to address environmental impacts.

3.1 Overview

This section provides an overview of the topics discussed in this chapter, describes how the potential environmental impacts of the action corridor alternatives were analyzed using a segment-by-segment or full-length corridor approach, and describes how a preferred corridor alternative was identified in Chapter 6, *Evaluation of Alternatives*, based on the potential environmental impacts presented in this chapter.

3.1.1 Environmental Topics

Table 3.1-1 lists the environmental resources discussed in this chapter.

Table 3.1-1. Environmental resources discussed in Chapter 3

Section	Topic	Section	Topic
3.1	Chapter overview	3.11	Biological resources
3.2	Land use	3.12	Hydrology, floodplains, and water resources
3.3	Social conditions	3.13	Waters of the United States
3.4	Economics	3.14	Cultural resources
3.5	Parkland and recreational facilities	3.15	Hazardous materials
3.6	Prime and unique farmland	3.16	Energy
3.7	Air quality	3.17	Environmental justice and Title VI
3.8	Noise	3.18	Temporary construction impacts
3.9	Visual resources	3.19	Section 4(f) and Section 6(f) resources
3.10	Topography, geology, and soils		

The study team did not analyze the following environmental resources because they do not occur in the study area: wild and scenic rivers, outstanding waters, wilderness areas, national natural landmarks, scenic roads and parkways, and coastal zones or barriers.

3.1.2 Approach to Analysis of Environmental Impacts

Most of the environmental impacts discussed in this chapter are described using a segment-by-segment approach—meaning that potential impacts of the action corridor alternatives are discussed based on the

limits of Segments 1 through 4 of the study area. The exceptions are air quality (Section 3.7) and energy (Section 3.16), where the potential environmental impacts are described for the full-length action corridor alternatives. Additional considerations for indirect and cumulative impacts are discussed in Chapter 4.

As noted in Chapter 2, *Alternatives*, the study area is divided into four segments that incorporate transition areas to allow the action corridor alternatives to shift east to west or west to east. The ability to make these shifts facilitates the avoidance of sensitive resources as necessary while maintaining a continuous north-to-south corridor. For air quality and energy, however, the segment-by-segment approach was not appropriate because shifting the corridor between segments would not make an appreciable difference with regard to regional air quality impacts or corridor-length energy use.

3.1.3 Approach to Identification of a Preferred Corridor Alternative

Potential impacts on the natural, human, and built environments discussed in this chapter informed the identification of a preferred corridor alternative, as discussed in detail in Chapter 6, *Evaluation of Alternatives*. The study team also used information regarding transportation and traffic operations, land use planning, stakeholder input, and the project purpose and need (see Chapter 1, *Purpose and Need*) to identify the preferred corridor alternative. Chapter 6 identifies the preferred corridor alternative by segment (Section 6.3.1) and by full-length corridor (Section 6.3.2). This final synthesis of the largely segment-by-segment analysis of environmental resources within the study area ensured that the study team did not overlook corridor-length environmental impacts in the process of identifying a preferred corridor alternative.

3.2 Land Use

The study area for the land use analysis encompassed the approximately 900-square-mile area that was defined early in the study process (Figure 3.2-1). The study area encompassed north-central Pinal County and a small portion of southeastern Maricopa County. Study area municipalities are the Cities of Apache Junction, Mesa, Coolidge, and Eloy, and the Towns of Queen Creek and Florence. Sovereign nations with land in the study area are the Gila River Indian Community and Tohono O'odham Nation. The study area does not necessarily follow tribal, municipal, or county boundaries, and only land in the study area was included in the analysis.

Located in the Sun Corridor, the study area has experienced substantial growth, which is projected to continue through 2040. Because of its proximity to Phoenix and Tucson, Pinal County has become a focus area for future development and economic growth in the Sun Corridor. Development pressure has begun to change the historically rural character of study area municipalities. Since 1990, Pinal County's population has increased by a factor of nearly 3.5, from 116,867 to 406,468 in 2015. By 2040, the county is projected to nearly double its 2015 population. As a result, and in accordance with Arizona Revised Statutes (A.R.S.), governing agencies in the study area have implemented policies regulating how, where, and to what extent future development may occur.

This section describes existing land ownership, management, land use, and zoning, and future land use for Maricopa and Pinal Counties and incorporated municipalities in the study area. It then describes how conditions are anticipated to change by 2040, with and without the proposed action, taking into account planned and projected development. This section then discusses whether the action corridor alternatives are consistent with existing land use plans and whether they would result in property acquisitions and displacements. Information is organized by the aforementioned categories and is presented by county and municipality to the extent feasible.

3.2.1 Regulatory Context

ADOT prepares all environmental documents in accordance with the requirements of NEPA. CEQ Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR Parts 1500 through 1508) stipulate that "possible conflicts between the proposed action and the objectives of federal, regional, state, and local (and in the case of a reservation, Indian tribe) land use plans, policies, and controls for the area concerned" be fully documented and evaluated in the appropriate environmental document. The regulations further state that to "better integrate environmental impact statements into state or local planning processes, statements shall discuss any inconsistency of a proposed action with any approved state or local plan and laws (whether or not federally sanctioned). Where an inconsistency exists, the statement should describe the extent to which the agency would reconcile its proposed action with the plan or law."

State law requires that municipalities and counties maintain a general or comprehensive plan, respectively. The plans are a municipal statement of land development policies that set forth objectives, principles, and standards for local growth and redevelopment.

The general framework identified in the guidance includes (1) understanding existing conditions and trends, (2) establishing policy assumptions, (3) estimating regional population and employment growth resulting from the change in accessibility, (4) inventorying land with development potential, and (5) assigning population to specific locations (FHWA 2010). Each step is either addressed in this document or has been used to inform the purpose and need for the proposed action.

3.2.2 Methodology

The study team analyzed existing study area land uses using a combination of aerial photographs, GIS data, digital orthophoto quadrangles, and consultation with representatives from the affected jurisdictions.

Existing land use data provided by county and municipal governments were input into electronic GIS files so that the impacts of each action corridor alternative could be evaluated. The data layers in the GIS files included the general land use types in the study area: agricultural, commercial, industrial, open space, public/quasi-public, residential, and undeveloped.

Open space includes public land designated as either active or passive open space (for example, parks and preserves). Note that the existing land use as described in this section does not necessarily match current zoning and land use plans because these plans and zoning programs are continually updated.

The study team collected regional and local land use and transportation plans from regional planning organizations, counties, and local jurisdictions. The team reviewed information in each plan for future land use, the future transportation network, and any discussion of potential future alignments of the Corridor.

To assess the expected impacts on land use from the action corridor alternatives, the study team used aerial photographs and GIS analysis to identify the types of land uses in each action corridor alternative and the number of acres that would be converted to a roadway use, along with how many potential property acquisitions or displacements would occur. In addition, the team analyzed each alternative's consistency with local and regional land use plans.

3.2.3 Affected Environment

Municipal information is based on existing incorporated municipal boundaries, not the MPAs. Each incorporated municipality in the study area has an MPA that identifies its area of planning concern, which is based on the anticipated future incorporated boundaries of that municipality. However, because land outside incorporated areas is considered county land until annexed, it was treated as such in this evaluation.

This study, as discussed in Section 3.2.4, *Environmental Consequences*, assumed that land identified within the MPAs will be incorporated by the 2040 build year of the proposed action and, subsequently, it is included in municipal calculations later in the section (No-Action Alternative).

Figure 3.2-1 depicts existing incorporated municipal boundaries and MPAs in the study area. The square mileage and acreage of incorporated municipal and MPA limits in the study area are presented in Table 3.2-1. Based on a study area of approximately 903 square miles, incorporated municipal land represents 22 percent of the total study area land, tribal land represents approximately 2 percent, and the remaining 76 percent is unincorporated Pinal County land.

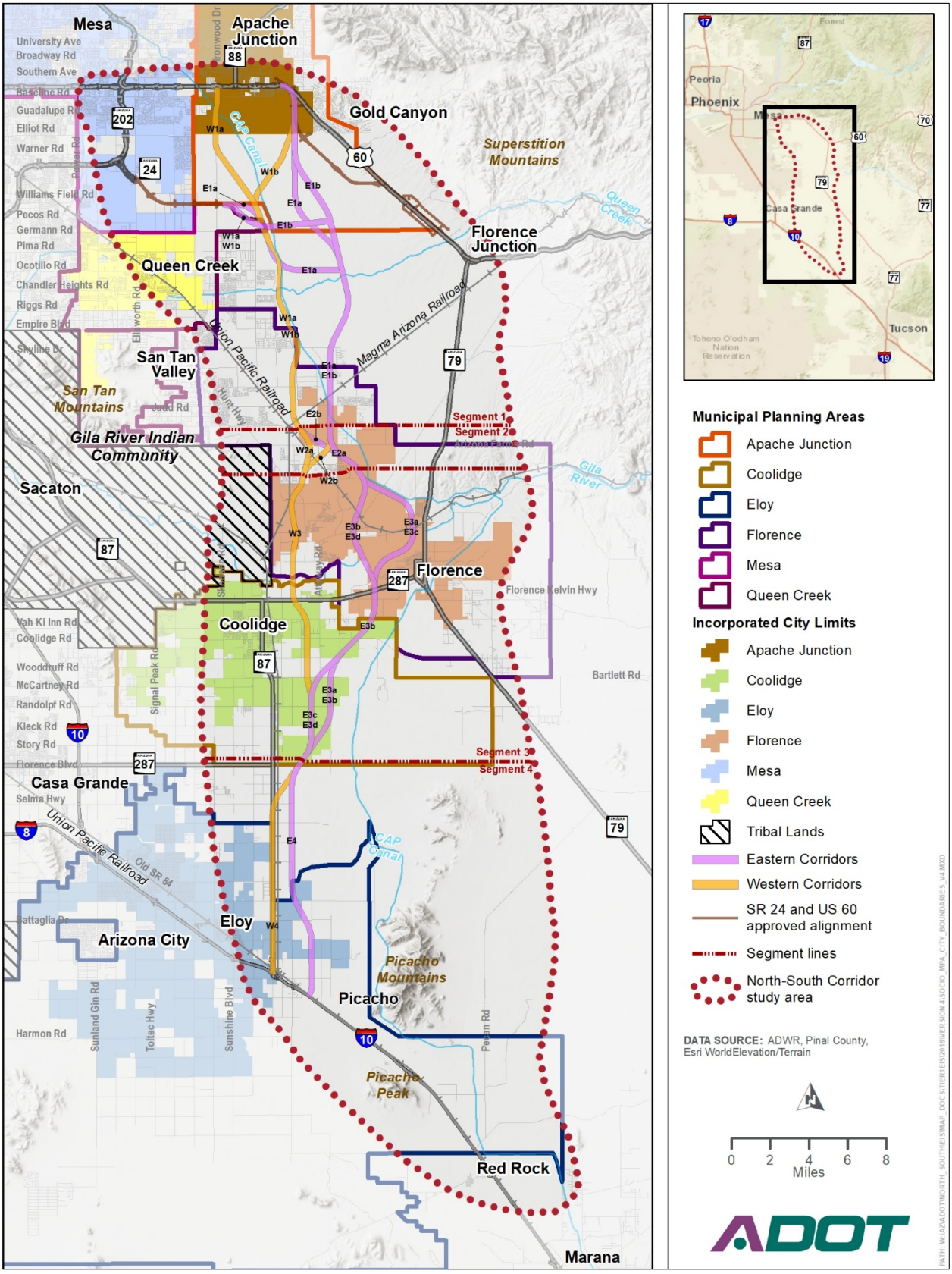
Table 3.2-1. Incorporated, municipal planning, and sovereign nation area of jurisdictions in the study area

Municipality[a]	Incorporated limits		Municipal planning area limits[b]	
	Square miles	Acres	Square miles	Acres
Apache Junction	19.5	12,487	69.0	44,171
Mesa	36.6	23,396	44.2	28,259
Queen Creek	12.0	7,653	23.0	14,748
Florence	61.6	39,409	165.0	105,578[c]
Coolidge	45.9	29,358	109.9	70,327
Eloy	21.6	13,811	132.2	84,588
Incorporated area subtotal	**197.1**	**126,114**	**—**	**—**
Gila River Indian Community	19.5	12,511	19.5	12,511
Tohono O'odham Nation	0.1	44	0.1	44
Unincorporated	685.9	438,996	—	—
Total area	**902.6**	**577,664**	**—**	**—**

[a] Only the acreage and square mileage included in the study area limits are reported.

[b] Land that overlaps two or more municipal planning areas is considered part of Pinal or Maricopa County and is not reported in the municipal planning area limits summary.

Figure 3.2-1. Municipal planning areas and incorporated boundaries



3.2.3.1 Land Ownership and Management

Most land in the study area is either owned by ASLD or private land owners (Table 3.2-2). ASLD manages State Trust land on behalf of the trust's beneficiaries, and this land may transfer to private interests through sale or lease for residential, commercial, or employment development or for agricultural or natural resource extraction uses. It is anticipated that much of the future growth in the study area would result from the sale of ASLD land for development. Figure 3.2-2 shows land ownership in the study area.

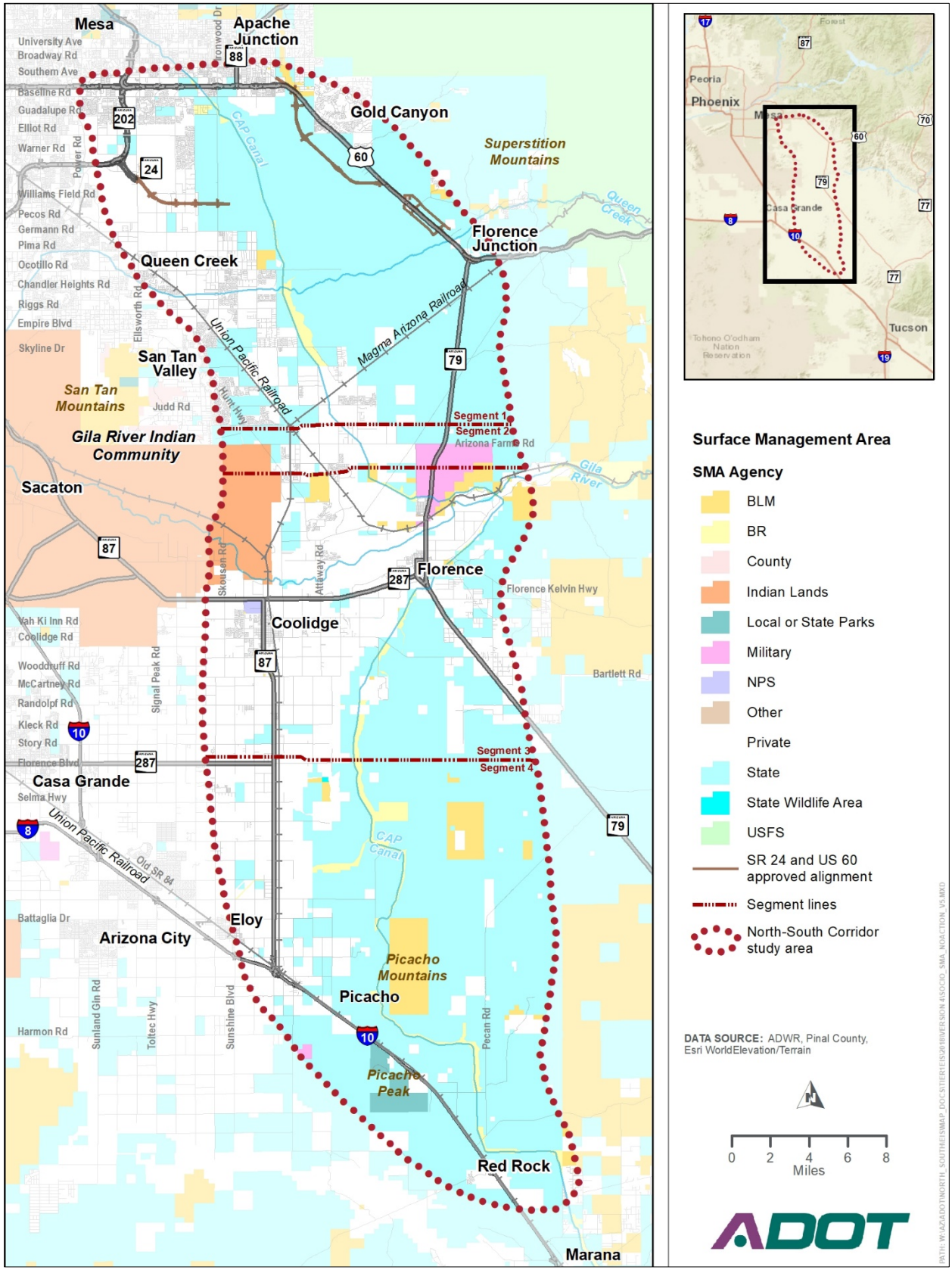
Table 3.2-2. State, federal agency, and sovereign nation existing land ownership and management in the study area, 2015

Land owner/manager	Percentage of study area
Arizona State Land Department	52.1
Private entity	39.2
U.S. Bureau of Land Management	2.9
Gila River Indian Community	2.2
U.S. Bureau of Reclamation	1.9
Florence Military Reservation[a]	1.0
Arizona State Parks	0.6
Casa Grande Ruins National Monument	0.1
Arizona Game and Fish Department	<0.1
Parks and Recreation	<0.1
Tohono O'odham Nation	<0.1
Total	**100.0**

Source: Arizona State Land Department, Arizona Land Resource Information System (2012). Arizona Land Resource Information System land ownership information does not include local planning agencies' land ownership.

Note: The Florence Military Reservation is managed by the Arizona Army National Guard, in cooperation with other state and federal agencies.

Figure 3.2-2. Surface land management in the study area



Federal, tribal, and non-ASLD land in the study area includes:

- U.S. Bureau of Land Management – This agency's land is located south of Tonto National Forest (which is north of and outside the study area), near Gold Canyon, at the Florence Military Reservation, at the Rittenhouse Army Heliport (which is operated by the Arizona Army National Guard), and in large swaths in the southern portion of the study area, near Eloy. Smaller parcels of U.S. Bureau of Land Management land are dispersed throughout the study area.
- Military – Land in the study area owned or managed by the Arizona Army National Guard.
    - The Florence Military Reservation is on unincorporated Pinal County and incorporated Florence land, north of downtown Florence. The approximately 40-square-mile site is managed by the Arizona Army National Guard in cooperation with other state and federal agencies.
    - Rittenhouse Army Heliport is on unincorporated Pinal County land, east of Queen Creek. The facility is owned by the Arizona Army National Guard. The site is listed as a military helicopter training and staging field with night and day operations.
- National Park Service – Managed by the National Park Service, Casa Grande Ruins National Monument is one of the largest prehistoric structures ever built in North America. The monument is in Coolidge, south of SR 87 and west of SR 287.
- State – State land (excluding ASLD land, discussed separately) in the study area includes McFarland State Historic Park, Picacho Peak State Park, and a 53-acre parcel adjacent to Picacho Reservoir managed by the Arizona Game and Fish Department (AGFD).
- Tribal – Two tribal nations have sovereign land in the study area. A brief description of these is provided below, with additional detail presented in Section 3.14, *Cultural Resources*.
    - The Gila River Indian Community is located west of Florence. Approximately 12,522 acres of undeveloped tribal land is located in the study area (Gila River Indian Community 2015).
    - The Tohono O'odham Nation contains more than 2.8 million acres on four land bases. One of the smaller bases, Florence Village, is located in the study area, north of SR 287. Florence Village is approximately 44 acres (Tohono O'odham Nation 2014).
- U.S. Bureau of Reclamation – The 336-mile CAP Canal was constructed by the U.S. Bureau of Reclamation. In 1971, the Central Arizona Water Conservation District was formed and since then has managed and operated the canal.

3.2.3.2 Existing Land Use

Existing land use by county, municipality, and tribal nation is described in detail below and is presented in Table 3.2-3 and Figure 3.2-3.

Table 3.2-3. Existing land use in the study area, 2015

Geographic area[a]	Total acres[b]	Agricultural (%)	Commercial (%)	Industrial (%)	Open space (%)	Public/ Quasi-public (%)	Residential[c] (%)	Undeveloped (%)
Maricopa County	13,410	37.1	4.7	0.0	0.1	2.4	30.3	25.8
Pinal County	423,820	10.7	0.1	1.2	0.7	1.0	6.3	80.0
Apache Junction	12,545	0.0	0.6	2.3	1.4	2.5	19.1	74.0
Mesa	23,396	9.1	11.3	3.6	2.2	2.4	37.0	34.3
Queen Creek	558	98.3	0.0	0.0	0.0	0.0	1.7	0.0
Florence	39,654	30.4	0.1	5.9	0.1	1.4	7.7	54.5
Coolidge	37,734	82.7	0.7	2.3	1.8	0.9	7.0	4.5
Eloy	13,851	75.6	0.0	4.5	0.0	0.3	2.0	17.6
Tribal land	12,566	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Study area	**577,534**	**18.5**	**0.7**	**1.8**	**0.7**	**1.1**	**8.3**	**68.9**

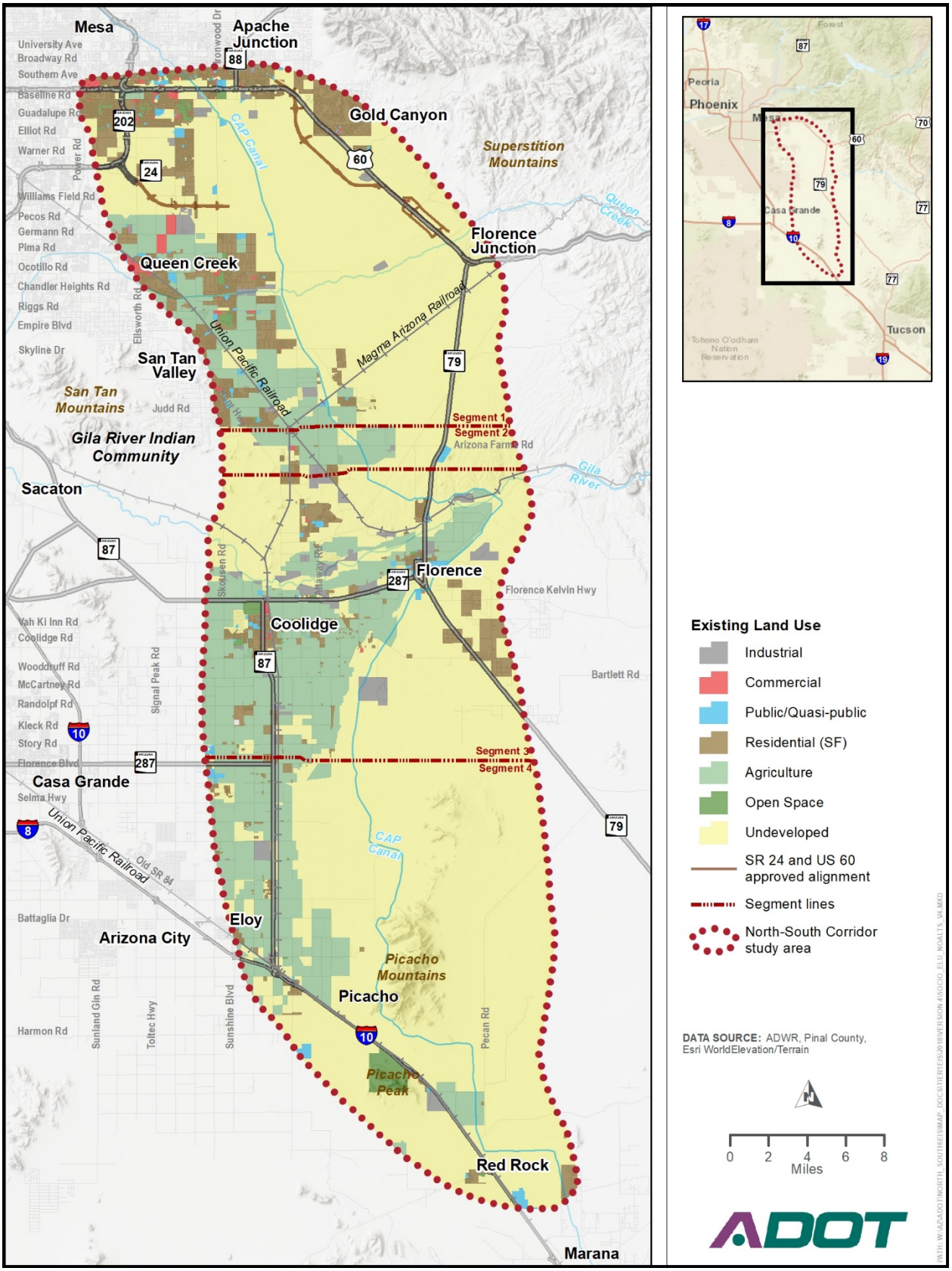
Source: compilation of data from municipal entities and remote sensing, 2016

[a] Information presented for study area municipalities is based on incorporated municipal limits and not municipal planning area boundaries. Unincorporated areas are counted as part of county land.

[b] Acreage is reported for only the portion of tribal, municipal, or county land within the study area.

[c] Residential includes single-family, multifamily, and mobile home park/manufactured housing.

Figure 3.2-3. Existing land use



Maricopa County

Only a small portion of Maricopa County is in the study area. This includes incorporated areas in Mesa and Queen Creek and unincorporated county land (land use discussions for these jurisdictions are provided below).

Pinal County

Most of Pinal County land in the study area that is outside incorporated municipal limits is generally classified as agricultural or undeveloped. Historically, most suburban and urban development in Pinal County has occurred in incorporated municipalities. Recently, however, many homes have been constructed in unincorporated areas.

Apache Junction

Apache Junction is located in Maricopa and Pinal Counties, with portions in far northern Pinal County and far eastern Maricopa County. US 60 is the primary east-to-west corridor connecting Apache Junction with the unincorporated area of Gold Canyon to the east and Phoenix to the west. Ironwood Drive, an important north-to-south arterial street in Apache Junction and Pinal County, traverses the western portion of the city.

Mesa

Mesa is in Maricopa County in the northwestern part of the study area. Major thoroughfares include US 60 and SR 202L. The Phoenix-Mesa Gateway Airport is in the far southeastern portion of Mesa that is in the study area. This area has seen significant development in the past 10 years, including both employment uses and residential development.

Queen Creek

Queen Creek is primarily in southeastern Maricopa County, with a small section in northwestern Pinal County. It is in the western portion of the study area, south of Mesa. Most of Queen Creek within the study area is agricultural and residential development. The area traversed by the existing and planned SR 24 (from SR 202L to Ironwood Drive) is undeveloped ASLD land.

Florence

Florence, the Pinal County seat, is located along the Gila River where SR 287 and SR 79 intersect. Currently, large portions of Florence are undeveloped or in agricultural use—land that is being converting to residential use. This includes Anthem at Merrill Ranch, a developing 3,100-acre, 8,500-home master-planned community adjacent to Hunt Highway. The Florence Townsite Historic District was listed on the National Register of Historic Places (NRHP) in 1982 and includes over 140 historic buildings. The historic town center includes a cluster of commercial businesses and numerous buildings used to support county government activities.

Coolidge

While the city has retained much of its agricultural base, it has also experienced substantial residential growth since 2000. Single-family homes are the dominant residential type and are concentrated around the downtown core. Casa Grande Ruins National Monument is north of downtown. The Coolidge Municipal Airport is southeast of downtown. Approximately 11,000 acres of Pinal County land were recently annexed by the City, and the landowner proposes to construct a new inland port[1] and industrial

[1] Inland ports are locations where international cargo bypasses coastal ports of entry and goes through customs and other processing at an inland location, with goods typically transported inland by rail.

site 0.25 mile east of SR 87 between Hanna and Houser Roads (Southwest Traffic Engineering, LLC 2015).

Eloy

Eloy is in the southern portion of the study area. It is primarily served by I-10 and SR 87 and secondarily by a smaller arterial street network. UPRR tracks run parallel to I-10 and north-to-south along SR 87, an area the City plans for industrial and mixed-use development.

3.2.3.3 Planned Land Use

County and municipal land use plans are designed to serve as long-range visions for how a jurisdiction would like to develop over the next 20 to 30 years. This section provides an overview of jurisdictional planning documents and regional transportation plans, and notes whether the plans identify the Corridor.

State law sets forth the general parameters that jurisdictions follow when developing a zoning ordinance or modifications thereof (rezoning). Specifically, the statutes stipulate that the zoning ordinance and subsequent updates must be consistent with the respective jurisdiction's comprehensive or general plan. As a result, the future land use map included in the comprehensive and general plans reflects anticipated growth based on allowable uses and densities. It should be noted that the future land use maps include land in the MPAs that has yet to be annexed. The zoning ordinance, however, includes only currently incorporated areas and is routinely updated as land is incorporated.

County and Municipal Plans

MARICOPA COUNTY

The Maricopa County *Vision 2030 Comprehensive Plan* was approved by the Maricopa County Board of Supervisors in January 2016. The plan does not mention the Corridor; however, the Maricopa County Department of Transportation *Major Streets and Routes Plan* (2011) references the North-South Freeway as a proposed high-capacity facility.

PINAL COUNTY

The vision and strategic direction for Pinal County are outlined in the *2009 Pinal County Comprehensive Plan* (updated 2015). Chapter 4 of the plan (*Mobility and Connectivity*) states that introducing new major roadways would help alleviate some of the pressure on the existing roadway and freight network while also providing economic advantages for the county. The plan recognizes that the alignment of a north-to-south transportation corridor and other proposed projects are subject to change (Pinal County 2015).

APACHE JUNCTION

The Apache Junction *2010 General Plan* was adopted by the City in 2010. The plan stipulates that connecting regional transportation systems and providing additional access points to and from US 60 are priorities for improving circulation in the city. The plan does not specifically mention the Corridor (City of Apache Junction 2010).

MESA

The Mesa *2040 General Plan* was adopted in 2014. The plan does not reference the Corridor (City of Mesa 2014).

QUEEN CREEK

The 2018 *General Plan* was approved by voters on May 15, 2018. The plan does not identify a preferred alignment (Town of Queen Creek 2018).

FLORENCE

The Florence *2020 General Plan* was adopted in 2008. The *2020 General Plan* Future Land Use map was amended in 2014 to reflect the "North-South ADOT Freeway Conceptual Corridor" (Town of Florence 2014).

COOLIDGE

The Coolidge *General Plan 2025* was adopted in 2014. In December 2016, the City amended the plan's Circulation Element to show the City's preferred alignment and potential traffic interchange locations for the Corridor.

ELOY

The City of Eloy *2010 General Plan Update* was adopted in 2011. The *General Plan* Circulation Element map was amended in 2015 to show the City's preferred Corridor alignment.

Regional Plans

Transportation studies influencing the study area and region were summarized in the 2014 ASR. Additional information regarding these plans is presented in Section 1.3.3, *Previous Transportation Studies in the Study Area*. The regional transportation plan affecting and implementing local planning documents is described below.

PINAL REGIONAL TRANSPORTATION PLAN

The Pinal Regional Transportation Authority was formed in 2015 by the Pinal County Board of Supervisors (in accordance with A.R.S. § 48-5302). The Pinal Regional Transportation Authority is a public, political, tax-levying improvement subdivision of the state. The *Pinal Regional Transportation Plan*, approved by Pinal County voters on November 7, 2017, represents the County's 20-year transportation plan and includes funding for ROW acquisition and construction of portions of the "North-South Parkway." Pinal County voters also approved Proposition 417, which levies a half-cent transportation excise tax to fund transportation projects over the next 20 years.

Future Land Use

Anticipated future land use in the study area is presented in Table 3.2-4 and Figure 3.2-4. By 2040, new development in the study area is projected to be substantial because the study area is centrally located in the Sun Corridor between Phoenix and Tucson and because over 90 percent of the study area is available for development (39 percent is privately owned and 52 percent is ASLD land).

Table 3.2-4. Future land use in the study area under the No-Action Alternative, 2040

Geographic area[a]	Total acres[b]	Agricultural (%)	Business park (%)	Commercial (%)	Industrial (%)	Mixed use (%)	Neighborhood[c] (%)	Open space (%)	Public/ Quasi-public (%)	Residential[d] (%)
Pinal County[e]	205,436.8	0.0	5.1	0.3	3.2	1.6	0.9	28.5	0.9	59.4
Apache Junction	44,170.8	2.2	0.8	0.0	0.0	0.0	0.0	5.8	0.5	90.7
Mesa[f]	28,258.2	0.0	17.2	3.8	0.0	42.1	0.0	0.1	2.3	34.4
Queen Creek[f]	14,748.7	0.0	28.9	2.9	7.8	14.4	0.0	3.0	1.0	41.9
Florence	105,537.3	0.2	0.0	6.3	12.7	0.4	0.0	10.2	8.3	62.1
Coolidge	70,326.5	7.4	0.0	13.8	4.3	0.5	51.0	0.4	3.5	19.0
Eloy	84,587.9	0.1	1.4	2.4	11.3	6.4	0.0	4.5	1.1	72.4
Tribal land	12,565.7	0.0	0.0	0.0	0.0	99.6	0.0	0.0	0.0	0.4
Other[g]	11,902.5	0.0	17.2	3.8	0.0	42.1	0.0	0.1	2.3	34.4
Study area	**577,534.4**	**1.1**	**3.7**	**3.6**	**6.5**	**6.2**	**6.5**	**13.2**	**2.6**	**56.4**

Source: compilation of data from municipal entities and remote sensing, 2016

[a] Acreage is reported only for the portion of tribal, municipal, and county land in the study area.

[b] Information presented for study area municipalities is based on municipal planning area boundaries.

[c] Neighborhood refers to a land use category in Coolidge that allows a mixture of uses, including neighborhood-scale commercial, professional office, and single-family and multifamily residential at varying densities, along with other community facilities and services, parks, and open space.

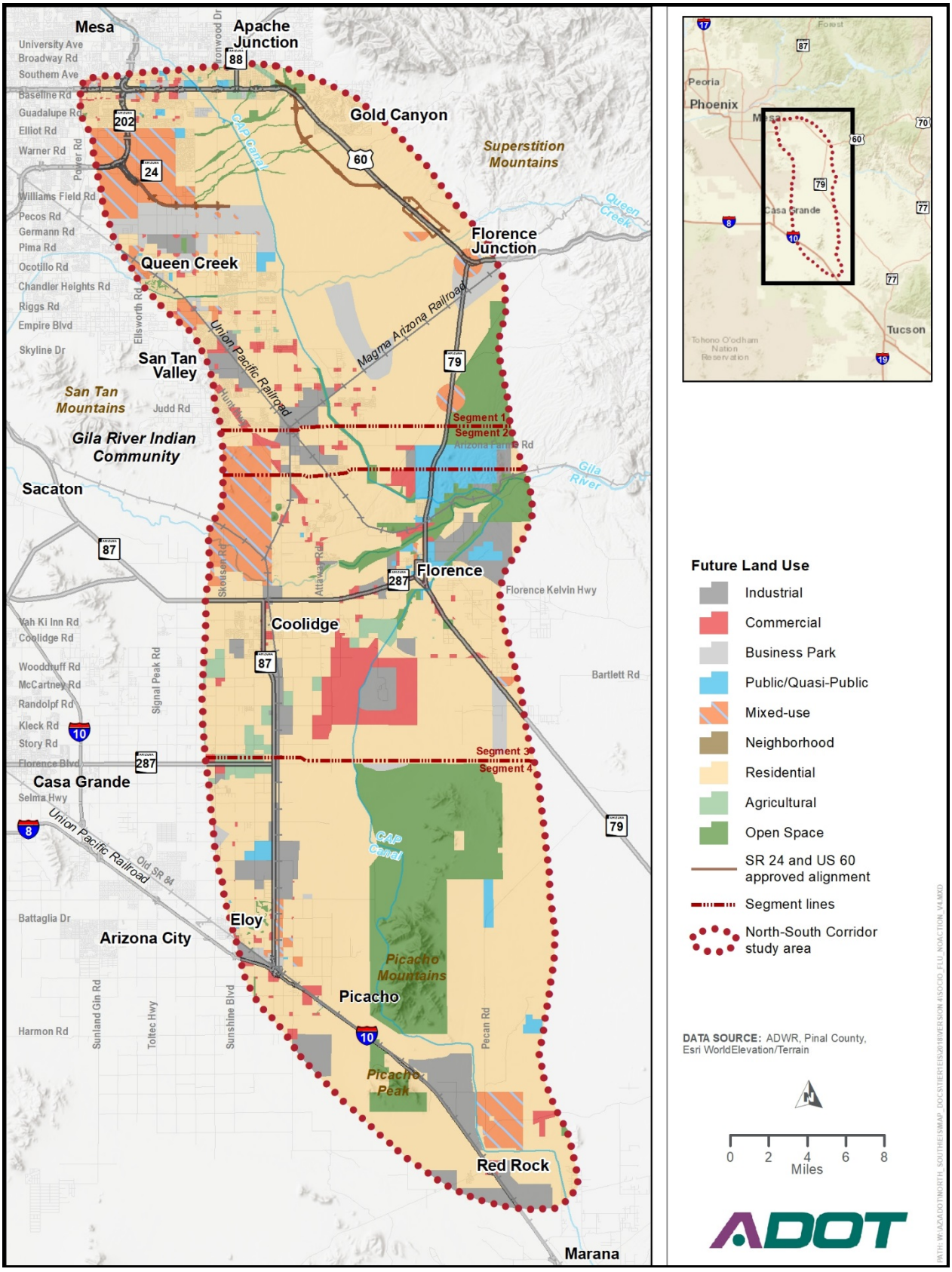
[d] Residential includes single-family and multifamily housing.

[e] Land identified in more than one municipal planning area is included in the Pinal County total.

[f] Previously reported unincorporated land in Maricopa County is now presented in either the Mesa or Queen Creek municipal planning area.

[g] The "other" category includes land in the Marana municipal planning area.

Figure 3.2-4. Future land use under the No-Action Alternative, 2040



Planned Developments

Study area municipalities identify more than 100 planned or proposed residential developments (subdivisions or master-planned communities) and several economic activity centers that may be constructed by the 2040 build year of the proposed action. Some of these potential developments are well along in the development process; others are still conceptual. These developments are reflected in the jurisdictions' general plan land use maps, which, along with the *Pinal County Comprehensive Plan*, are represented in Figure 3.2-4, and the referenced larger planned developments in the study area are described below and shown in Figure 3.2-5.

Lost Dutchman Heights is a proposed 7,700-acre development on ASLD land. The development would be east and west of the CAP Canal, and south of US 60, from Baseline Road to Elliot Road. The proposed project includes nearly 40,000 housing units, 6 to 8 million square feet of commercial space, and approximately 250 acres of light industrial business park development. Major arterial streets in Lost Dutchman Heights are planned to match up with the grid system. Project planning is reflected in Apache Junction's *General Plan* and *Comprehensive Transportation Study*, which shows the general location of the roadway network for the project.

Superstition Vistas is a 275-square-mile tract of undeveloped ASLD land that extends from Apache Junction to Florence. Once built in full, the area would accommodate up to 1 million residents and include commercial and open space land uses. Superstition Vistas is anticipated to be built over the next several decades. A developer-sponsored comprehensive plan for the area was completed in 2012, and in late 2012 the Pinal County Board of Supervisors approved the Superstition Vistas amendment to the *Pinal County Comprehensive Plan*.

Mesa Gateway Employment Center is the area surrounding the Phoenix-Mesa Gateway Airport. The 2008 strategic plan for this area envisions a regional employment center with the potential to attract up to 100,000 jobs.

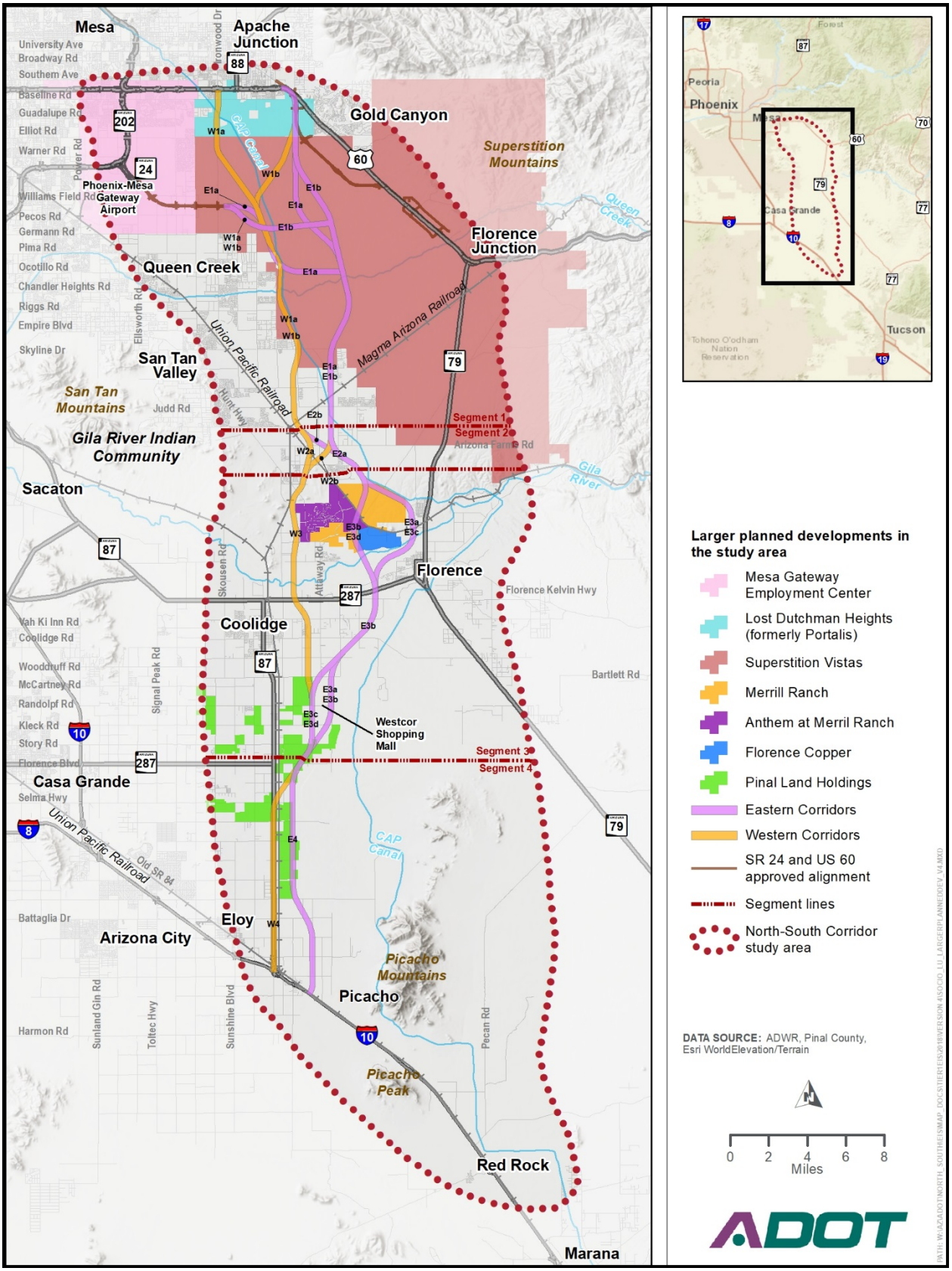
Anthem at Merrill Ranch is a large master-planned community (3,100 acres) of 8,500 housing units within the Florence portion of the study area. At this time, approximately 2,500 single-family housing units have been built.

Florence Copper is a 1,342-acre site where mineral exploration and development activities have occurred since the 1960s. The site currently operates in-situ copper recovery production test facilities including injection, recovery, and monitoring wells; solution storage tanks; and a water impoundment. The site is planned to advance to commercial production (SRK Consulting 2010). The in-situ copper recovery process is used to recover copper from the subsurface without significant land disturbance.

Westcor Shopping Mall is a large regional commercial center proposed southeast of downtown Coolidge.

Inland Port Arizona and Pinal Logistics Park is a proposed inland port and industrial site on approximately 1,500 acres of Pinal Land Holdings land, east of SR 87 in the city of Coolidge.

Figure 3.2-5. Larger planned developments in the study area



3.2.4 Environmental Consequences

The following sections describe anticipated conditions in the study area, both with and without the proposed action, by the 2040 build year of the proposed action. While the existing conditions analysis was based on currently incorporated municipal boundaries, the impact analysis assumes that all land identified in the MPAs will have been annexed by the respective jurisdictions by 2040. In some instances, MPA boundaries are still being determined. Land that is currently reported in more than one MPA is presented under Pinal County.

3.2.4.1 No-Action Alternative

Under the No-Action Alternative, land in the study area would continue to be converted from agricultural and undeveloped use to residential and commercial uses. In their comprehensive or general plans, study area jurisdictions have identified their preferred long-term land use scenarios. The No-Action Alternative analysis is based primarily on a review of these plans and on information provided by individual jurisdictions regarding planned and proposed development.

The *Pinal Regional Transportation Plan* contains potential transportation projects through 2037, including the “North-South Parkway.” The plan forms the basis of the No-Action Alternative by considering all planned transportation projects except for the North-South Freeway. With the No-Action Alternative, the North-South Freeway would not be constructed and no other new project or projects would be identified in the *Pinal Regional Transportation Plan* to replace the North-South Freeway to improve regional mobility.

With the No-Action Alternative, no direct impacts on land uses would occur as a result of the North-South Freeway. With the expected population growth rate, by 2040 much of the agricultural land in incorporated areas of the study area would be converted to urban uses, particularly residential, with or without the North-South Freeway. The growth can occur without the facility because the study area has readily available land and good, but congested, transportation access to regional destinations. This access is one of the reasons why the area has changed substantially from agricultural uses to suburban development.

Under the No-Action Alternative, development in the study area is anticipated to be substantial by 2040. Municipal and county partners have identified more than 100 planned and proposed developments in the study area. Some of these developments, and the existing infrastructure, would be affected to varying degrees under the action corridor alternatives. However, as described in the next section, much of the new development in the study area would be supported by the introduction of a new north-to-south transportation corridor.

Land use plans for jurisdictions in the study area show a mixture of residential and commercial uses in the future to support the projected growth in population and employment. With both the No-Action and action corridor alternatives, the Pinal Regional Transportation Authority would continue to develop other projects in the *Pinal Regional Transportation Plan*, independent of the North-South Freeway. The impacts of these projects, which are independent of the North-South Freeway, would be evaluated in separate environmental documents.

Based on travel demand modeling scenarios, the construction of new roads that are local in scale would not adequately handle the projected demand.

3.2.4.2 Action Corridor Alternatives

The analysis conducted for the action corridor alternatives assumed that land would be similarly converted as described under the No-Action Alternative. As a result, the analysis considered the extent to which the proposed action corridor alternatives would affect existing and future land use, evaluated whether the action corridor alternatives would be consistent with identified planning and policy

documents, and determined whether they would potentially result in property acquisitions and displacements.

Existing Land Use

The direct land use impact of the action corridor alternatives is the ROW needed for the alignment, which would be established in subsequent Tier 2 studies. However, overlaying the action corridor alternatives on the existing land uses provides an understanding of the types and areas of impact that may be experienced with the selection of an action alternative. Table 3.2-5 shows the area of existing land uses within the action corridor alternatives for each of the study area segments.

Table 3.2-5. Acreage of affected existing land uses, by action corridor alternative

Action corridor alternative	Land use							Total
	Agricultural	Commercial	Industrial	Public/ Quasi-public	Residential	Open space	Vacant/ Undeveloped	
Segment 1								
E1a	168	0	0	6	20	0	4,688	4,883
E1b	168	0	0	0	20	0	4,263	4,451
W1a	744	3	3	8	69	64	2,725	3,614
W1b	744	0	0	8	40	0	2,873	3,664
Segment 2								
E2a	454	0	0	0	2	0	57	514
E2b	612	0	0	0	0	0	57	669
W2a	374	0	1	0	0	0	103	479
W2b	436	0	29	0	2	0	94	560
Segment 3								
E3a	2,180	0	126	0	74	0	989	3,369
E3b	1,993	0	128	0	56	0	842	3,018
E3c	2,130	0	126	0	35	0	1,098	3,389
E3d	1,943	0	128	0	17	0	951	3,038
W3	1,615	0	69	9	23	0	1,045	2,760
Segment 4								
E4	1,619	0	14	0	15	0	632	2,280
W4	1,405	0	98	1	136	0	447	2,088

Source: analysis of action corridor alternatives and existing land uses (2015), using aerial photography

SEGMENT 1

The E1a, E1b, and W1b Alternatives share a similar footprint at their system traffic interchange with US 60. Residential development at the southwestern corner of this interchange would be affected by the Corridor; however, an alignment in the Corridor may avoid these impacts. The development's access is from the west from Goldfield Road and would not be affected. Depending on the system traffic interchange configuration, access to US 60 from Goldfield Road may be affected. South of US 60, these alternatives cross undeveloped land for most of their lengths (the W1b Alternative merges with the W1a Alternative west of the CAP Canal). The merged E1a and E1b Alternatives would affect rural residential properties south of Skyline Drive, although an alignment in the Corridor may avoid these properties. South of the Magma Arizona Railroad, the E1a and E1b Alternatives cross the CAP Canal and agricultural land.

The W1a Alternative would have a system traffic interchange with US 60 at the Ironwood Drive alignment. All four corners of this interchange are developed. Depending on the interchange configuration, access to US 60 from Ironwood Drive may be affected. Apache Junction High School is situated in the northeastern quadrant of the interchange. Depending on the intersection configuration, an alignment in the Corridor may avoid direct impacts on Apache Junction High School. The southwestern quadrant is occupied by a manufactured home development with access from both Ironwood Drive and Baseline Road. The southeastern quadrant is occupied by a golf course. Ironwood Drive has an annual ADT volume of nearly 30,000. Depending on the alignment, the W1a Alternative may require through frontage roads because of traffic volume and local access issues. These include the industrial development west of the W1a Alternative and an existing wastewater treatment plant to the east, both accessed exclusively from Ironwood Drive by way of Guadalupe Road.

South of Elliot Road, the W1a Alternative shifts off the Ironwood Drive alignment and turns southeast over undeveloped land, east of the planned connection with SR 24, to where the W1b Alternative merges with the W1a Alternative (just north of the proposed system traffic interchange with SR 24) and is coincident with the E1b Alternative's SR 24 connection.

A Salt River Project power substation extends approximately 400 feet into the W1a, W1b, and E1a Alternative footprints. South of Germann Road, the alternatives cross through the eastern side of the Rittenhouse Army Heliport, located adjacent to existing residential development to the west and south, with the CAP Canal to the east. The E1a Alternative crosses the CAP Canal at Ocotillo Road, where it follows the Ocotillo Road alignment.

South of the Rittenhouse Army Heliport, the W1a and W1b Alternatives follow the western edge of the CAP Canal ROW across undeveloped and agricultural land immediately east of existing residential subdivisions. The alternatives would affect a rural residential development north of Skyline Drive. South of Skyline Drive, the W1a and W1b Alternatives traverse undeveloped and agricultural land for the remainder of Segment 1.

SEGMENT 2

In Segment 2, the merged Eastern and Western Alternatives each split east and west across agricultural land, with only the E2b Alternative directly affecting rural residential development located in the southwestern quadrant of Arizona Farms and Attaway Roads.

SEGMENT 3

At the northern end of Segment 3, the E3a, E3b, E3c, and E3d Alternatives traverse undeveloped land. The alternatives split in the northern part of the segment, and the E3a and E3c Alternatives follow the CAP Canal, then turn south just west of a mobile home and recreational vehicle park on SR 79, north of the Gila River. South of Segment 2, the E3b and E3d Alternatives follow a southwesterly alignment

across the UPRR and Hunt Highway across undeveloped land approximately 0.75 mile east of the developed Anthem at Merrill Ranch master-planned community. South of Hunt Highway, the E3b and E3d Alternatives curve to the southeast and are immediately adjacent to the southwestern portion of the Florence Copper property (the proposed in-situ copper recovery facilities/activities and related mine facilities are not anticipated to pose any geological risks or issues for the alternatives). The E3b and E3d Alternatives cross agricultural land before crossing the Gila River immediately east of sand and gravel mining activities on the northern bank of the river. The E3a and E3c Alternatives cross the Gila River approximately 0.5 mile west of SR 79 before turning to the west across agricultural fields and an active private wedding and event site in Florence. The E3a and E3c Alternatives continue across agricultural land before turning south across Adamsville Road, where they rejoin the E3b and E3d Alternatives and cross undeveloped land and SR 287.

South of SR 287, the Eastern Alternatives would affect an electrical substation, although a Tier 2 alignment in this corridor may avoid impacts on this property. The Eastern Alternatives continue southeast across agricultural land, affecting several rural residences east and west of the crossing of Valley Farms Road and Coolidge Avenue. The Eastern Alternatives continue southwest across Martin Road, splitting around the regional shopping center planned for the southwestern corner of Bartlett and Wheeler Roads.

The E3a and E3b Alternatives follow Wheeler Road south, affecting several rural residential properties south of Bartlett Road.

South of Kleck Road, the E3a and E3b Alternatives traverse agricultural land, rejoin the E3c and E3d Alternatives, and continue southwest across agricultural land before splitting south of Steele Road.

A developed subdivision along Hunt Highway south of Arizona Farms Road extends approximately 300 feet into the W3 Alternative (no homes are within the action corridor alternative footprint). The W3 Alternative then crosses Hunt Highway and turns south at UPRR and continues across undeveloped land. South of the North Side Canal, the W3 Alternative crosses agricultural land and the Gila River just west of sand and gravel operations on the river's northern bank.

South of the Gila River, the W3 Alternative crosses agricultural land and would affect several rural homes on the northern side of SR 287 and extends less than 200 feet over the edge of an existing cemetery. The W3 Alternative traverses agricultural land and would affect several rural homes before merging with the E3c and E3d Alternatives south of Bartlett Road on the Fast Track Road alignment.

The W3, E3c, and E3d Alternatives traverse agricultural and undeveloped land until joining the E3a and E3b Alternatives at Storey Road. There the merged alternatives curve to the southwest across agricultural land at the southern end of Segment 3.

SEGMENT 4

South of Steele Road, the Eastern and Western Alternatives would affect a rural residential property before diverging. The E4 Alternative follows the Fast Track Road alignment past Picacho Reservoir and across agricultural and undeveloped land to its juncture with I-10.

After diverging, the W4 Alternative continues southwest across UPRR to SR 87, with which it is coincident south from Selma Highway to its juncture with I-10. UPRR runs parallel to SR 87 on the eastern side to its juncture with the UPRR Sunset Line on the northern side of I-10. South of Hanna Road, the W4 Alternative crosses less than 200 feet over the eastern edge of the Eloy Detention Center. South of Shedd Road, the W4 Alternative would affect a number of rural homes whose primary access is from SR 87. SR 87 is a two-lane road today, and any alignment coincident with SR 87 would require frontage roads or other means of preserving access to the agricultural land east of SR 87 and west of UPRR.

Additional rural homes would be affected south of Alsdorf Road because they are situated along the western side of SR 87, with access only from SR 87. At the southern end of the W4 Alternative, south of Battaglia Drive, a cotton warehousing facility is on the eastern side of the alternative and an agricultural chemical supply site is on the western side. Another cotton warehouse facility may be affected by the W4 Alternative and the proposed traffic interchange with I-10.

Future Land Use

The land use impact analysis included a review of all study area jurisdictions' comprehensive or general plans and an evaluation of the action corridor alternatives to determine consistency with these documents and to assess the potential direct and indirect impacts of each action corridor alternative on different land use types.

The discussion that follows compares the action corridor alternatives by segment. Land in areas where action corridor alternatives overlap is considered for all applicable action corridor alternatives. Future land use and the action corridor alternatives are presented in Figure 3.2-6.

Land Use Compatibility

Table 3.2-6 describes whether the action corridor alternatives would be compatible with anticipated future land use patterns for areas near the proposed action. While the analysis that follows assumes that all planned developments would be constructed by 2040, there may be an opportunity to work with municipal and county partners, other landowners, and developers to increase land use compatibility. This would depend on identifying a preferred alternative prior to constructing the developments.

Figure 3.2-6. Future land use under the action corridor alternatives, 2040

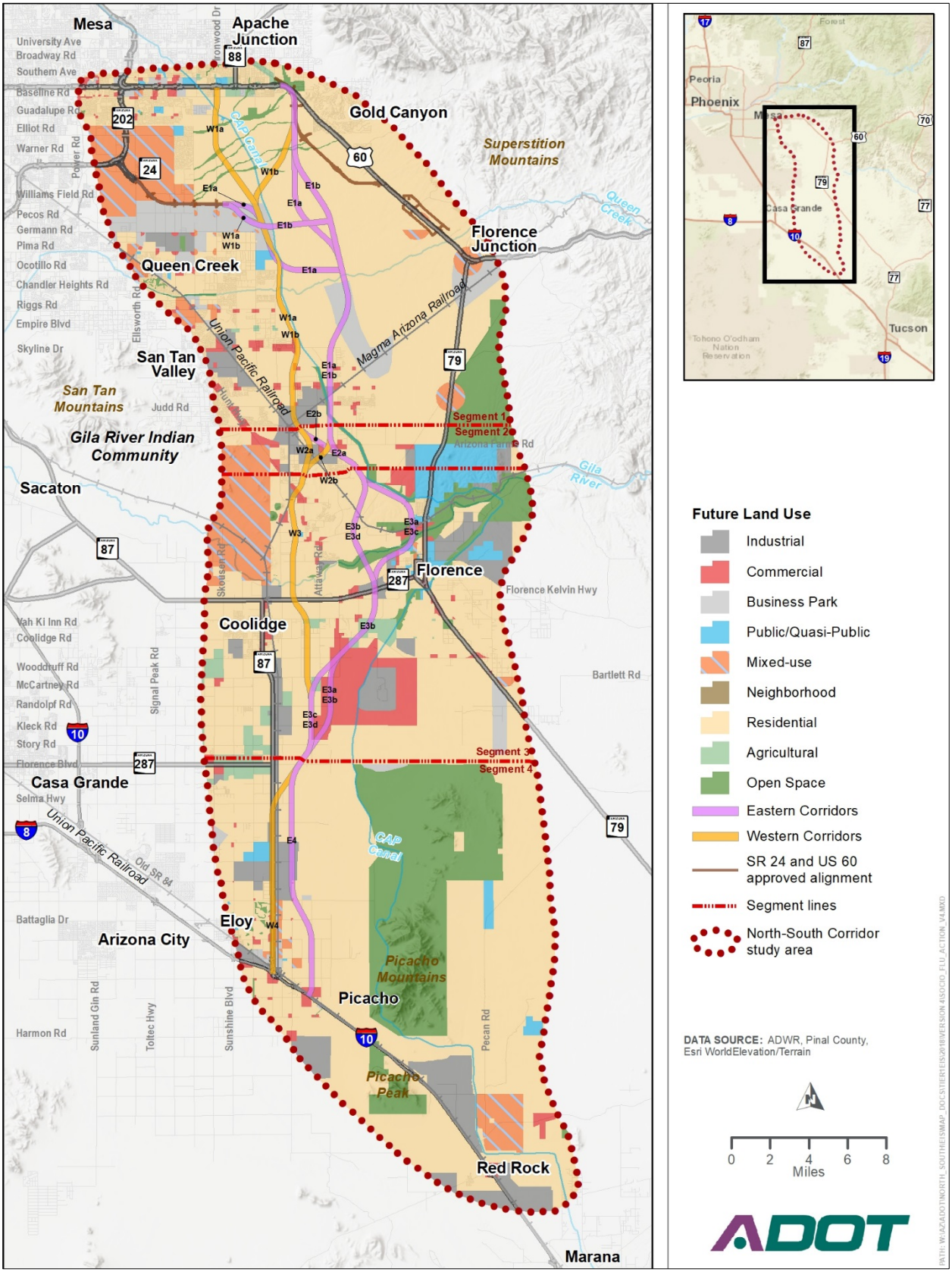


Table 3.2-6. Land use compatibility with the action corridor alternatives

Action corridor alternative	Land use compatibility
Segment 1	
Segment 1	• Most of the affected land in Segment 1 is owned by ASLD and is undeveloped.

E1a	• Almost all of the land potentially affected by the E1a Alternative is ASLD land proposed for future master-planned communities such as Lost Dutchman Heights (north of Elliot Road) and Superstition Vistas (south of Elliot Road).
	• Because most land is currently undeveloped, the E1a Alternative provides more opportunities to design an alignment that minimizes impacts on existing development and lessens impacts on the Lost Dutchman Heights development.
	• Affects the
	  ○ developing Dolce Vita residential development at US 60 (the development extends less than 400 feet into the 1,500-foot corridor).
	  ○ Rittenhouse Army Heliport.
	  ○ Sonoran Villages planned multifamily development.
	  ○ planned Dobson Farms residential subdivision.

E1b	• Almost all of the land potentially affected by the E1b Alternative is ASLD land proposed for future master-planned communities such as Lost Dutchman Heights (north of Elliot Road) and Superstition Vistas (south of Elliot Road).
	• Because most land is currently undeveloped, the E1b Alternative provides more opportunities to design an alignment that minimizes impacts on existing development and lessens impacts on the Lost Dutchman Heights development, and is the preferred alignment for ASLD's Superstition Vistas planning area.
	• Requires crossing the Rittenhouse Flood Retarding Structure, which is planned to be raised.
	• Affects the
	  ○ developing Dolce Vita residential development at US 60 (the development extends less than 400 feet into the 1,500-foot corridor).
	  ○ Sonoran Villages planned multifamily development.
	  ○ planned Dobson Farms residential subdivision.

W1a	• Almost all of the land potentially affected by the W1a Alternative is ASLD land proposed for the Lost Dutchman Heights future master-planned community (north of Elliot Road).
	• Would require mitigation where the alternative is aligned with Ironwood Drive because of the volume of local traffic on this route and local access that uses Ironwood Drive today.
	• Affects the
	  ○ Rittenhouse Army Heliport.
	  ○ planned Quail Run Estates residential subdivision.
	  ○ planned Bella Vista residential subdivision.
	  ○ developing Skyline Estates residential subdivision.

W1b	• Does not affect the Lost Dutchman Heights development and would be relatively more compatible with ASLD's Superstition Vistas planning area than would be the W1a Alternative.
	• Affects future land use the most because of the development planned along Ironwood Drive. Under all Segment 1 alternatives, the majority of potentially affected land is planned as residential.
	• Requires crossing the Vineyard Flood Retarding Structure, which is planned to be raised.
	• Affects the
	  ○ developing Dolce Vita residential development at US 60 (the development extends less than 400 feet into the 1,500-foot corridor).
	  ○ Rittenhouse Army Heliport.
	  ○ planned Quail Run Estates residential subdivision.
	  ○ planned Bella Vista residential subdivision.
	  ○ developing Skyline Estates residential subdivision.

Table 3.2-6. Land use compatibility with the action corridor alternatives

Action corridor alternative	Land use compatibility
Segment 2	
E2a	• Potentially affects the ○ planned Dobson Farms residential subdivision. ○ northeastern corner of the conceptual Arizona Farms residential subdivision. ○ planned regional commercial and high-density residential land on Arizona Farms Road, a potential traffic interchange (although not as much as E2b because E2a is less skewed). ○ conceptual Paloroso residential subdivision. ○ planned Felix Farms residential subdivision. ○ Mesquite Trails residential subdivision (although a Tier 2 alignment in this alternative may avoid impacts on the platted portion of this development).
E2b	• May create access issues for remnant parcels, depending on the alignment, because of the close proximity of the Magma and Union Pacific Railroads. • Potentially affects the ○ planned Dobson Farms residential subdivision. ○ northeastern corner of the conceptual Arizona Farms residential subdivision. ○ planned regional commercial and high-density residential land on Arizona Farms Road, a potential traffic interchange. ○ conceptual Paloroso residential subdivision. ○ planned Felix Farms residential subdivision. ○ Mesquite Trails residential subdivision.
W2a	• May create access issues for remnant parcels, depending on the alignment, because of the close proximity of the Magma and Union Pacific Railroads. • Potentially affects the ○ planned Dobson Farms residential subdivision. ○ northeastern corner of the conceptual Arizona Farms residential subdivision. ○ conceptual Magic Ranch residential subdivision.
W2b	• Potentially affects the ○ planned Dobson Farms residential subdivision. ○ conceptual Arizona Farms residential subdivision. ○ conceptual Magic Ranch residential subdivision.
Segment 3	
E3a	• Potentially affects the ○ planned Mesquite Trails residential subdivision. ○ northeastern edge of the planned Merrill Ranch residential subdivision where it borders the CAP Canal. ○ planned Heritage Creek Estates residential subdivision. ○ Town of Florence Territory Square Zoning District. The area potentially affected is planned for a mix of civic and recreation uses, and includes a new roadway parallel to the Gila River extending from Plant Road to SR 79. ○ conceptual Dobson/Florence residential subdivision. ○ conceptual Florence Industrial Park on the northern side of SR 287. ○ eastern edge of the planned Urton Farms residential subdivision. ○ planned Sendera residential subdivision. ○ eastern edge of the planned Westcor regional shopping center at the southwestern corner of Bartlett and Wheeler Roads.
E3b	• Potentially affects the ○ planned Mesquite Trails residential subdivision. ○ planned Merrill Ranch residential subdivision north and south of the Hunt Highway. ○ developing Anthem at Merrill Ranch residential subdivision. ○ conceptual Dobson/Florence residential subdivision. ○ conceptual Florence Industrial Park on the northern side of SR 287. ○ eastern edge of the planned Urton Farms residential subdivision. ○ planned Sendera residential subdivision. ○ eastern edge of the planned Westcor regional shopping center at the southwestern corner of Bartlett and Wheeler Roads.

Table 3.2-6. Land use compatibility with the action corridor alternatives

Action corridor alternative	Land use compatibility
E3c	• Potentially affects the ○ planned Mesquite Trails residential subdivision. ○ northeastern edge of the planned Merrill Ranch residential subdivision where it borders the CAP Canal. ○ planned Heritage Creek Estates residential subdivision. ○ Town of Florence Territory Square Zoning District. The area potentially affected is planned for a mix of civic and recreation uses, and includes a new roadway parallel to the Gila River extending from Plant Road to SR 79. ○ conceptual Dobson/Florence residential subdivision. ○ conceptual Florence Industrial Park on the northern side of SR 287. ○ eastern edge of the planned Urton Farms residential subdivision. ○ planned Sendera residential subdivision. ○ western edge of the planned Westcor regional shopping center at the southwestern corner of Bartlett and Wheeler Roads. ○ planned Sontesta residential subdivision.
E3d	• Potentially affects the ○ planned Mesquite Trails residential subdivision. ○ planned Merrill Ranch residential subdivision north and south of the Hunt Highway. ○ developing Anthem at Merrill Ranch residential subdivision. ○ conceptual Dobson/Florence residential subdivision. ○ conceptual Florence Industrial Park on the northern side of SR 287. ○ eastern edge of the planned Urton Farms residential subdivision. ○ planned Sendera residential subdivision. ○ western edge of the planned Westcor regional shopping center at the southwestern corner of Bartlett and Wheeler Roads. ○ planned Sontesta residential subdivision.
W3	• Potentially affects the ○ edge of the developing Oasis at Magic Ranch subdivision (no homes are within the alternative corridor footprint). ○ conceptual Magic Ranch residential subdivision. ○ conceptual Twin Peaks residential subdivision. ○ portion of the planned Walker Butte residential subdivision, east of the Southern railroad. ○ developing Anthem at Merrill Ranch residential subdivision. ○ planned Patria residential subdivision. ○ planned Kachina Heights residential subdivision. ○ planned Sontesta residential subdivision.
Segment 4	
E4	• Potentially affects the ○ planned Hanna Picacho residential development. ○ conceptual Bool Eloy 2180 residential development. • Supports the conceptual Inland Port Arizona and Pinal Logistics Park, an inland port and industrial site proposed on approximately 1,500 acres east of SR 87 between Hanna and Houser Roads.
W4	• Potentially affects the ○ conceptual Bool Eloy 2180 residential development. ○ planned Roberts Resort residential development. ○ planned Pamilla residential development. ○ planned Daybreak at Picacho residential development.

Notes: ASLD = Arizona State Land Department, CAP = Central Arizona Project, SR = State Route, US 60 = U.S. Route 60

Planning and Policy Documents

The need for a north-to-south transportation corridor has increased as study area municipalities and the larger Sun Corridor have experienced substantial growth over the past 30 years. More recently, and as mentioned previously, a number of studies have been commissioned to evaluate the need for an enhanced transportation network in and around the study area.

As these studies have advanced and confirmed the need for a north-to-south transportation corridor based on existing and projected demand, some study area jurisdictions have incorporated the proposed action into their comprehensive or general plans. Other jurisdictions have not specifically identified the proposed action in their comprehensive or general plans but have identified the need for improved regional connectivity and a safe, efficient transportation network.

Tables 3.2-7 and 3.2-8 describe how and to what extent the proposed action would be consistent with existing comprehensive and general plans and regional transportation plans.

Overall, study area jurisdictions are in agreement that a new north-to-south transportation corridor is necessary; however, the preferred alignment of that corridor is disputed.

Table 3.2-7. Comprehensive and general plans' consistency with the action corridor alternatives

Geographic area plan	North-South Corridor referenced?	Preferred alternative identified?	Action corridor alternatives' consistency comments
Pinal County *2009 Pinal County Comprehensive Plan*	Yes	No	Generally consistent with the comprehensive plan. A north-to-south transportation corridor has been incorporated into the transportation element of the *2009 Pinal County Comprehensive Plan*; however, it does not specify a preferred alternative.
Maricopa County *Vision 2030 Comprehensive Plan*	No	No	Generally consistent with the comprehensive plan. The action corridor alternatives would help achieve transportation-specific goals identified in the plan.
City of Apache Junction *2010 General Plan*	No	No	Generally consistent with the general plan. The action corridor alternatives would (1) improve access to and from US 60 and (2) introduce a roadway network that can support future development south of Baseline Road. Both goals were identified in the general plan.
City of Mesa *2040 General Plan*	No	No	Generally consistent with the general plan. The proposed action would support municipal goals of concentrated economic development along US 60 and the area surrounding the Phoenix-Mesa Gateway Airport.
Town of Queen Creek *General Plan Update 2018*	Yes	No	Generally consistent with the general plan. Identifies the SR 24 extension and North-South Freeway as contributing to the Town's regional transportation access, and alleviating congestion as a result of regional through traffic that affects the community today. Identifies the need for multijurisdictional coordination regarding implementing and maintaining a regional transportation network that can accommodate existing and projected demand.
Town of Florence *2020 General Plan*	Yes	E1a/E1b, E2a, E3a/E3c	Generally consistent with the general plan. The extent of this consistency will be determined once a preferred alternative is identified. The plan's future land use map identifies the Town's preferred alignment for the proposed action. This was later reaffirmed in the Town of Florence Resolution 1490-14 (December 2014, see Appendix A). The resolution supports the E1a/E1b, E2a, and E3a/E3c Alternatives and does not support the E3b/E3d Alternatives.

Table 3.2-7. Comprehensive and general plans' consistency with the action corridor alternatives

Geographic area plan	North-South Corridor referenced?	Preferred alternative identified?	Action corridor alternatives' consistency comments
City of Coolidge *2025 General Plan*	Yes	E3a/E3b, E4	Consistent with the general plan. The extent of this consistency will be determined once a preferred alternative is identified. The plan's future land use map identifies the Town's preferred alignment for the proposed action. The City's identified corridor follows the *Alternatives Selection Report* "AB" segment (no longer a viable option), and then generally follows the E3a/E3b and E4 Alternatives. The plan stipulates that the economic impact of a north-to-south transportation corridor through the city would be "significant and one of the most important transportation and land use goals that must be addressed by local, county, and state leaders as well as private property owners" (City of Coolidge 2014).
City of Eloy *2010 General Plan Update*	No	W4	Consistent with the general plan. The extent of this consistency will be determined once a preferred alternative is identified. In a letter from December 2014, the City of Eloy expressed support for the W4 Alternative for the following reasons: (1) reduced right-of-way acquisition and mitigation costs, (2) proximity and connectivity to downtown Eloy, (3) better distribution of vehicular and transit trips, and (4) enhanced opportunities for economic development along the SR 87 corridor. This was later reaffirmed in the City of Eloy Resolution 15-1343 (March 2015).

Source: comprehensive and general plans prepared by or for study area geographies (dates vary)
Notes: SR = State Route, US 60 = U.S. Route 60

Table 3.2-8. Regional and other transportation plans' consistency with the action corridor alternatives

Study	North-South Corridor referenced?	Preferred alternative identified?	Action corridor alternatives' consistency comments
Pinal Regional Transportation Plan, May 2016[a]	Yes	No	Consistent with the plan. The comprehensive multimodal regional transportation plan elements are financed with a transaction privilege (sales) tax for regional transportation purposes, including right-of-way acquisition for the North-South Freeway alignment.
Southeast Maricopa/ Northern Pinal County Area Transportation Plan, 2003	Yes	Illustrative alignment included	Consistent with the plan. The plan identified four new primary thoroughfares, one of which was the Apache Junction Coolidge Corridor (later renamed the North-South Corridor). Generally follows the Western Alternative, with two options identified at the southern end (one east-west, aligned with Interstate 8, and one north-south co-located with SR 87).
Pinal County Corridors Definition Study, 2007	Yes	West alignment; the study illustrates a western alignment that bypasses Florence	Largely consistent with the plan. Recommendations set forth in the report included a north-to-south transportation corridor and were adopted into MoveAZ, the then-current statewide long-range transportation plan. Inclusion in MoveAZ allowed for funding studies that would identify potential alignments of a north-to-south transportation corridor. The study noted that there is no need for a north-to-south corridor south of SR 287.
Statewide Transportation Planning Framework Program, 2010	Yes	Illustrative alignment included	Consistent with the plan. The Central Arizona Regional Framework Study, which was undertaken as part of the Framework Program, identified the need for a major north-to-south transportation corridor in the study area.
Pinal County Regionally Significant Routes Plan for Safety and Mobility, 2017 update	Yes	Illustrative alignment	Consistent with the plan. An illustrative alignment notes that the alignment is currently under study by ADOT. The document identifies both the Eloy (W4) and Coolidge (E4) Alternatives as Council-approved corridors.
Coolidge-Florence Regional Transportation Plan, 2008	Yes	No	Consistent with the plan. This plan developed a regional multimodal transportation system for the Coolidge-Florence planning areas. Based on anticipated growth in 2008, traffic projections with and without a north-to-south transportation corridor in 2025 were modeled. Recommendations set forth in the plan identified continued coordinated efforts regarding a design concept study for a north-to-south transportation corridor.
Queen Creek Small Area Transportation Study, 2008	Yes	No	Consistent with the plan. The study focused on identifying long-term transportation planning issues, primarily within Queen Creek's municipal limits. However, it also identified a north-to-south transportation corridor and need for coordinating future road systems to promote connectivity between and among communities.

Sources: regional plans prepared by or for study area geographies (dates vary)
Notes: ADOT = Arizona Department of Transportation, SR = State Route
[a] The *Pinal Regional Transportation Plan* was approved by Pinal County voters on November 7, 2017.

Potential Acquisitions and Displacements

The action corridor alternatives would result in property acquisitions and the potential displacement of residents, businesses, and community facilities depending on the exact ROW needs to accommodate a Tier 2 alignment. In areas that are currently developed, the risk that ROW requirements would affect existing properties is higher than in currently undeveloped areas. Agricultural land impacts would be

greatest with action corridor alternatives that use Western Alternative options in Segment 1, Eastern Alternative options in Segment 3, and the E4 Alternative in Segment 4. Agricultural and farmland acquisition impacts are discussed in Section 3.6, *Prime and Unique Farmland*.

Table 3.2-9 shows the number of residential properties that may potentially be affected with each action corridor alternative. These represent the properties within the 1,500-foot action corridor alternative footprints; impacts based on a Tier 2 alignment would be lower. Business impacts are not calculated because the impact on business properties is difficult to assess prior to defining a Tier 2 alignment.

Table 3.2-9. Residential properties potentially displaced by action corridor alternatives

Action corridor alternative	Potential displacements	Action corridor alternative	Potential displacements
Segment 1		***Segment 3***	
E1a	64	E3a	17
E1b	64	E3b	16
W1a	315	E3c	5
W1b	72	E3d	4
Segment 2		W3	2
E2a	0	***Segment 4***	
E2b	0	E4	3
W2a	0	W4	57
W2b	0		

Sources: compilation of Pinal County Assessor information (2017) and review of aerial photography (2016)

In Segment 1, existing residential development concentrated in the northern end of the Eastern and Western Alternatives is at the greatest risk of displacement. The W1a Alternative would affect a considerable number of homes at the juncture of Ironwood Drive and US 60, although the number would be less with a Tier 2 alignment. With the E1a, E1b, and W1b Alternatives, the Corridor overlays homes south of US 60 and east of Goldfield Road, although the number would be less with a Tier 2 alignment. In addition, farther south in Segment 1, there are a few locations where both the Eastern and Western 1,500-foot-wide corridors include homes; however, actual impacts would be less once a Tier 2 alignment defined.

Several businesses are located on either side of US 60 where the Corridor would meet US 60. A system traffic interchange at Ironwood Drive with the W1a Alternative would likely require the acquisition of nonresidential property, whereas the connection with the E1a, E1b, and W1b Alternatives east of Goldfield Road may have less of an impact on nonresidential properties.

In Segment 2, none of the action corridor alternatives would displace residents, businesses, or community facilities.

In Segment 3, the W3 Alternative may potentially affect a few rural residences located south of SR 287, and a private airport south of Bartlett Road and west of Fast Track Road. The E3a and E3c Alternatives, which follow a more eastern alignment closer to Florence, would avoid affecting developed property south to Adamsville Road, with the exception of potential impacts on a rural residence and a portion of the private commercial event center located immediately south of the Gila River. The E3b and E3d Alternatives would not affect developed property. All Eastern Alternatives have the potential to affect

isolated residential, civic, and commercial property south of Adamsville Road—the extent of these impacts would be determined during Tier 2 studies. The E3a and E3b Alternatives may potentially affect a few rural residences along Wheeler and Kleck Roads.

In Segment 4, the E4 and W4 Alternatives have the potential to affect isolated rural residences south to Shedd Road. However, between Shedd and Houser Roads and between Alsdorf Road and I-10, the W4 Alternative may affect several residential and commercial properties because it would be co-located with SR 87. The E4 Alternative would not result in any displacements.

Land acquisition and relocation assistance services would be available to all affected parties and individuals in accordance with the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended (Uniform Act). The Uniform Act is implemented through 49 CFR Part 24, which provides regulations for federally funded highway projects. Objectives of the Uniform Act include:

- Providing uniform, fair, and equitable treatment of persons whose property is acquired or who are displaced as a result of a federally funded project.
- Ensuring relocation assistance is provided to displaced persons to lessen the emotional and financial impact of being displaced.
- Ensuring that no individual or family is displaced unless decent, safe, and sanitary housing is available within the displaced person's financial means.
- Improving the housing conditions of displaced persons currently living in substandard housing.
- Encouraging and expediting acquisition by agreement and without coercion.

3.2.5 Potential Avoidance, Minimization, and Mitigation Strategies

Construction of the North-South Freeway would result in direct, indirect, and cumulative impacts that could require mitigation. At this stage in the development of the proposed freeway, potential mitigation measures can be identified only in general terms—such as minimizing impacts on residential and sensitive environmental areas—until a specific alignment is defined during Tier 2 studies.

The following describes potential mitigation measures to consider as future commitments to avoid, minimize, or mitigate adverse impacts on land use that may result from implementing the proposed action. ADOT may elect to modify, remove, or add measures to mitigate impacts, as appropriate and feasible, as the decision-making process advances and a preferred alternative is identified. Potential mitigation measures identified to date include:

- ADOT would continue to be an active participant in a broader effort with MPOs, local jurisdictions, resource agencies, and private stakeholders to cooperatively plan development in the study area. The effort would coordinate wildlife connectivity, local land use planning, and context-sensitive design for the facility.
- ADOT would coordinate with the entities managing affected public land (for example, ASLD, BLM, and U.S. Bureau of Reclamation) to accommodate the proposed action. In the case of ASLD, ADOT would continue to engage with the Superstition Vistas Steering Committee or other entities involved in planning efforts for this area of State Trust land.

Appendix D, *Summary of Avoidance, Minimization, and Mitigation Strategies*, contains a consolidated list of strategies to address environmental impacts.

3.2.5.1 Local Agency Mitigation Strategies

The following describes potential mitigation measures for local planning agencies to consider as future commitments to avoid, minimize, or mitigate adverse impacts on land use that may result from

implementing the proposed action. ADOT would work with municipal and county partners to determine the extent to which the below-mentioned measures are appropriate.

- Amending general plans as necessary, depending on individual municipality amendment requirements as stipulated by State law. A.R.S. § 9-461.06 requires each municipality to prepare a plan for addressing major amendments to its general plan. Depending on the municipal requirements, a major amendment process may be triggered by changes to the land use plan to accommodate the proposed action (or the No-Action Alternative, in the case of Pinal County). By statute, major amendments may be considered only once per calendar year.
- Clustering development in certain areas or allowing new development patterns to accommodate a transportation corridor through the area.
- Considering, on a case-by-case basis, mitigation initiated by private landowners as advocated by affected jurisdictions to improve the compatibility of land uses adjacent to the proposed action. The implementation of this strategy would be the responsibility of the affected jurisdictions and landowners and would be subject to the affected jurisdiction's land development approval process.
- Rezoning undeveloped land to more freeway-compatible uses.

3.2.6 Subsequent Tier 2 Analysis

Future Tier 2 studies would address specific impacts on private and public property, planned developments, zoning regulations, neighborhoods, or community facilities. The approach to acquisitions, easements, and displacements, including ownership (public or private), would be determined as part of project-specific Tier 2 studies. Tier 2 studies would also address compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the Civil Rights Act of 1964, which ensure that property owners (residential and business) receive fair market value for their property and that displaced persons receive fair and equitable treatment and do not suffer disproportionate harm because of programs designed for overall public benefit.

Additionally, the specific alignment and locations of traffic interchanges would be planned in coordination with local government entities and with public input to minimize the potential for land use conflicts and to develop appropriate mitigation specific to each location.

3.2.6.1 Conclusion

Based on 2040 projections under the No-Action Alternative, the implementation of new arterial and local roads would not adequately handle the projected travel demand. Study area municipalities recognize the need to implement a regional transportation network that can move people and goods within and through the entire study area. Some study area jurisdictions have incorporated a north-to-south transportation corridor in their general plans; others have not specifically identified the proposed action in their comprehensive or general plans but have identified the need for improved regional connectivity and a safe, efficient transportation network. A north-to-south transportation corridor would be consistent with comprehensive and general plans for all study area municipalities; however, the extent to which this is recognized would depend on the alternative selected. All action corridor alternatives would require that land to accommodate a Tier 2 alignment within the 1,500-foot corridors be converted to a transportation use.

In the northern part of the study area, the E1b Alternative would result in fewer impacts on existing development in areas adjacent to US 60, would minimize impacts on the Lost Dutchman Heights development, and, along with E1a Alternative, is the preferred alignment for ASLD's plan for Superstition Vistas. The W1a Alternative would have the greatest impact on existing development. The location of a facility within the W1a Alternative, either along or adjacent to Ironwood Drive, would create traffic and

access issues. The W1b Alternative would avoid these impacts; however, it would require crossing the Vineyard FRS and the CAP Canal. The E1a, W1a, and W1b Alternatives would affect the Rittenhouse Army Heliport. All of the action corridor alternatives require crossing the CAP Canal; however the Eastern Alternatives require a second crossing to facilitate the SR 24 connection.

The existing development affected in Segment 2 is primarily agricultural; however, numerous planned developments would be affected by the alternatives. The E2b Alternative's skew with the potential interchange at Arizona Farms Road would result in the greatest impacts on planned developments in this area.

The W3 Alternative is not supported by the affected jurisdictions of Florence and Coolidge; however, it is the preferred alternative of the Four Southern Tribes (Ak-Chin Indian Community, Gila River Indian Community, Salt River Pima-Maricopa Indian Community, and Tohono O'odham Nation). The E3a and E3c Alternatives are similar to the Town of Florence's preferred alternative. The differences are primarily a result of adjustments to avoid environmentally sensitive sites in the areas north and south of the Gila River and to meet the project design criteria for accommodating future intercity passenger rail.

The W4 Alternative is preferred by the City of Eloy, which cited economic development opportunities with a route situated along SR 87. The City of Coolidge prefers the E4 Alternative because it would support recently annexed industrial and manufacturing land uses planned for the Inland Port Arizona and Pinal Logistics Park.

From a land use perspective, the E1b, E2a, E3a, and E4 Alternatives are the most consistent with land use planning in the study area. With the exception of the E4 Alternative, the noted action corridor alternatives are largely consistent with the affected jurisdictions' adopted land use plans. In the case of Segment 4, City of Eloy plans have adopted the W4 Alternative, whereas the City of Coolidge has adopted the E4 Alternative. Based on the land use impacts (including potential displacements and acquisitions), the W4 Alternative would have greater land use impacts.

3.3 Social Conditions

This section provides an overview of the study area's setting for social conditions and preliminary information concerning social conditions in the action corridor alternatives.

Social conditions are characteristics and cultural behaviors that develop from people interacting with each other in their communities and over time. Social conditions include demographic characteristics, availability of and access to community facilities, and community cohesion, all of which are described in this section.

3.3.1 Regulatory Context

CEQ regulations specify that "effects" include social and economic effects. Section 1508.14 of the CEQ regulations states when an EIS is prepared and economic or social and natural or physical environmental effects are interrelated, then the document will discuss all of these effects on the human environment. The Intermodal Surface Transportation Efficiency Act of 1991 incorporated 23 USC §§ 109(h) and 128, requiring that social and economic impacts of proposed federal-aid projects be determined, evaluated, and eliminated or minimized as part of project development. These include destruction or disruption of human-made and natural resources, aesthetic values, community cohesion, and the availability of public facilities and services; adverse employment effects and tax and property value losses; injurious displacement of people, businesses, and farms; and disruption of desirable community and regional growth. Implementing regulations for the legislation are contained in 23 CFR Part 771. Many of the provisions originating in the Intermodal Surface Transportation Efficiency Act of 1991 have been continued or expanded in subsequent surface transportation legislation, including the Transportation Efficiency Act for the 21st Century and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users.

This section assesses the effects of the action corridor alternatives on communities in the study area. In September 1996, FHWA published *Community Impact Assessment: A Quick Reference for Transportation* (Publication No. FHWA-PD-96-036) that lays out a process to better understand affected communities and residents and to evaluate the likely consequences of a proposed action such that human values and concerns receive proper attention during project development. The community impact assessment discussed in this section is also consistent with FHWA's Livability Initiative, which recognizes the relationships between transportation, infrastructure, land use, and community needs. The assessment evaluates the effects of a transportation action on a community and its quality of life.

3.3.2 Methodology

The evaluation presented in this section is based on available information regarding regional social conditions, which include demographic characteristics, availability of and access to community facilities, and community cohesion. The following sources describe the existing community character and resources in the study area:

- socioeconomic data, including population, race/ethnicity, age, housing, income, and employment:
    - U.S. Census Bureau's American Community Survey 2011 to 2015 5-year estimates, place data for the state of Arizona, Maricopa and Pinal Counties, and jurisdictions in the study area, as defined in Section 1.1.2, *Corridor Location and Study Area*
    - U.S. Census Bureau's American Community Survey 2011 to 2015 5-year estimates, block groups within or adjacent to the study area, assigned to each segment of the corridor

- community facilities, including educational, medical, recreational, and other public facilities:
    - data obtained from jurisdictional GIS databases, review of Google Earth imagery, and direct field observation

3.3.3 Affected Environment

This section describes existing demographic characteristics of the regional and study area populations, including population trends, race and ethnicity, age, employment, income, and housing. It also describes existing community facilities and services in the study area.

3.3.3.1 Demographic Characteristics

The following provides an overview of population and housing characteristics across the region and throughout the study area. Indicators presented below include historic and existing population, race and ethnicity, age, employment, income and poverty, and housing characteristics. Data have been retrieved from several sources, including the U.S. Census Bureau's American Community Survey 2011 to 2015 5-year estimates. Demographic characteristics are first presented in the regional context, followed by the specific study area segments.

Geographic areas included in the regional context are the state of Arizona, Maricopa and Pinal Counties, and incorporated municipalities in the 900-square-mile study area. Appendix E, *Social Conditions Information*, provides the methodology used to identify the appropriate census block groups included in each segment and action corridor alternative. Block groups that overlap multiple segments were assigned to only one segment, based on the methodology described in detail in Appendix E. Segment 2 includes portions of multiple block groups that were assigned to other segments; therefore, no block groups were analyzed for Segment 2, as noted in the following sections.

Population Trends

The regional population has increased substantially over the last several decades. Between 1970 and 2000, Arizona's population increased more than 187 percent (Table 3.3-1). During the same period, Maricopa County's population, where Phoenix is located, increased by over 215 percent. Pinal County, which has a considerably smaller population than Maricopa County, experienced slower population growth during this period; however, between 2000 and 2015, Pinal County experienced a 124 percent increase in population.

In 1970, the population of Maricopa County represented 55 percent of the total Arizona population—increasing to more than 60 percent in 2015. Comparatively, the 1970 Pinal County population represented less than 4 percent of the state population. This increased to approximately 6 percent by 2015.

Table 3.3-1. Population trends, 1970 to 2015

Geographic area	1970	1980	1990	2000	2010	2015	% change 1970–2000	% change 2000–2015
Arizona	1,794,912	2,737,774	3,684,097	5,160,586	6,411,999	6,758,251	187.5	31.0
Maricopa County	980,133	1,520,840	2,132,249	3,092,197	3,823,609	4,167,947	215.5	34.8
Pinal County	69,547	91,342	116,867	181,280	385,738	406,584	160.7	124.3

Race and Ethnicity

White non-Hispanics represent approximately 57 percent of Arizona's population, and of Maricopa and Pinal Counties (Table 3.3-2), while Hispanics or Latinos (of any race) represent approximately 30 percent. However, Eloy has a lower percentage of White non-Hispanics (23 percent) and a higher percentage of Hispanics or Latinos (of any race) (62 percent). Alternatively, Apache Junction and Queen Creek have higher percentages of White non-Hispanics (above 75 percent) and lower percentages of Hispanics or Latinos (of any race) (below 18 percent).

Arizona, Pinal County, Florence, and Coolidge all have populations of American Indians or Alaska Natives above 4 percent. In Pinal County, this is largely attributable to members of the Gila River Indian Community and Tohono O'odham Nation living in the county. The highest percentage of Black or African American residents is in Eloy (7 percent), followed by Florence (6 percent). Populations of Asians are below 4 percent in every jurisdiction.

Table 3.3-2. Race and ethnicity characteristics in the region

Geographic area	Total population	White alone (%)	Black or African American alone (%)	American Indian and Alaska Native alone (%)	Asian alone (%)	Other[a] (%)	Hispanic or Latino[b] (%)
Arizona	6,641,928	56.5	4.0	4.0	2.9	2.3	30.3
Maricopa County	4,018,145	57.3	4.9	1.6	3.7	2.3	30.1
Pinal County	389,772	58.0	4.4	4.7	1.6	2.2	29.1
Apache Junction	36,586	79.7	0.8	1.3	1.1	2.4	14.6
Mesa	458,860	64.0	3.4	1.8	1.9	2.3	26.6
Queen Creek	30,143	76.0	2.2	1.1	1.4	1.5	17.7
Florence	30,770	50.8	5.8	4.2	0.7	1.8	36.7
Coolidge	11,973	45.2	4.5	5.3	0.4	2.5	42.1
Eloy	16,954	22.8	7.3	1.6	2.6	3.8	61.9

Source: U.S. Census Bureau, American Community Survey 2011 to 2015 5-year estimates, Table B03002
[a] The "other" category includes those who identify themselves as non-Hispanic and Native Hawaiian and Other Pacific Islander alone, some other race alone, or two or more races.
[b] The Hispanic or Latino category includes all races.

The race and ethnicity characteristics of the study area are shown in Table 3.3-3 and discussed below.

Segment 1. The action corridor alternatives in Segment 1 all have similar race and ethnicity characteristics, with approximately 75 percent White non-Hispanic and approximately 17 percent Hispanic. All other populations in the study area have representations of 3 percent or less.

Segment 2. No block groups were analyzed for Segment 2. All block groups that fall within Segment 2 are also in adjacent segments; therefore, these population characteristics are summarized for adjacent segments. See Appendix E for a detailed description of the analysis methodology.

Segment 3. Over a third of the populations in the E3a and E3c Alternatives identify themselves as Hispanic or Latino (37 percent), while the percentage in the E3b and E3d Alternatives is lower, at 26 percent. The percentage in the W3 Alternative is 28 percent. Moreover, the E3a, E3b, E3c,

and E3d Alternatives have almost no representation from other non-White racial/ethnic categories (approximately 1 percent), while the W3 Alternative has a slightly higher representation (ranging from 1 to 5 percent).

Segment 4. In Segment 4, the E4 Alternative has a higher percentage of White non-Hispanic (57 percent) and a lower percentage of Hispanic or Latino (43 percent), while the W4 Alternative has a higher percentage of Hispanic or Latino and Black or African American (78 and 8 percent, respectively).

Table 3.3-3. Race and ethnicity characteristics in the study area

Action corridor alternative	Total population	White alone (%)	Black or African American alone (%)	American Indian and Alaska Native alone (%)	Asian alone (%)	Other[a] (%)	Hispanic or Latino[b] (%)	Minority (%)
Segment 1								
E1a	32,036	75.3	2.6	1.0	1.9	2.0	17.2	24.7
E1b	27,165	73.6	2.8	1.2	1.9	2.0	18.5	26.4
W1a	27,200	75.6	3.1	1.2	1.0	2.3	16.9	24.4
W1b	33,662	75.9	2.8	0.9	1.9	2.4	16.1	24.1
Segment 2[c]								
E2a, E2b, W2a, W2b	—	—	—	—	—	—	—	—
Segment 3								
E3a, E3c	10,353	59.0	1.4	1.6	0.3	0.7	37.0	41.0
E3b, E3d	12,678	67.3	1.1	1.3	0.3	1.3	28.6	36.7
W3	12,027	61.6	3.8	5.6	0.4	1.9	26.7	38.4
Segment 4								
E4	4,777	57.0	2.1	1.3	0.5	2.2	36.8	43.0
W4	14,182	24.3	8.2	2.1	2.9	5.0	57.4	75.7

Source: U.S. Census Bureau, American Community Survey 2011 to 2015 5-year estimates, Table B03002
[a] The "other" category includes those who identify themselves as non-Hispanic and Native Hawaiian and Other Pacific Islander alone, some other race alone, or two or more races.
[b] The Hispanic or Latino category includes all races.
[c] No block groups were analyzed for Segment 2 because all block groups that fall within Segment 2 are summarized in adjacent segments. See Appendix E for analysis methodology.

Age

Queen Creek has the highest percentage of residents under 18 years of age (40 percent) and the lowest percentage over 65 years of age (7 percent) (Table 3.3-4). Eloy has approximately 10 percent of over 65 years of age residents, while other jurisdictions have higher percentages, between 13 and 30 percent. Florence has the lowest percentage of under 18 years of age residents (13 percent), while other jurisdictions, apart from Queen Creek, have approximately 16 to 28 percent.

Table 3.3-4. Age characteristics in the region

Geographic area	Total population	Under 18 years of age (%)	18–44 years of age (%)	45–64 years of age (%)	65 years of age and over (%)
Arizona	6,641,928	24.3	35.9	24.5	15.4
Maricopa County	4,018,145	25.3	37.4	24.0	13.5
Pinal County	389,772	24.9	34.8	23.0	17.2
Apache Junction	36,586	19.5	25.1	24.9	30.4
Mesa	458,860	24.7	36.1	23.6	15.6
Queen Creek	30,143	39.6	33.7	19.5	7.2
Florence	30,770	13.2	45.5	23.9	17.5
Coolidge	11,973	28.1	32.1	27.3	12.6
Eloy	16,954	16.4	51.4	22.4	9.9

Source: U.S. Census Bureau, American Community Survey 2011 to 2015 5-year estimates, Table B01001

Age characteristics for the study area are shown in Table 3.3-5 and discussed below.

Table 3.3-5. Age characteristics in the study area

Action corridor alternative	Total population	Under 18 years of age (%)	18–44 years of age (%)	45–64 years of age (%)	65 years of age and over (%)
Segment 1					
E1a	32,036	26.9	32.2	22.1	18.7
E1b	27,165	24.9	31.6	23.0	20.4
W1a	27,200	28.2	34.8	18.8	18.1
W1b	33,662	26.1	33.6	21.8	18.4
Segment 2[a]					
E2a, E2b, W2a, W2b	—	—	—	—	—
Segment 3					
E3a, E3c	10,353	18.1	24.5	27.5	29.9
E3b, E3d	12,678	19.7	23.6	23.9	32.8
W3	12,027	30.8	32.1	18.6	18.5
Segment 4					
E4	4,777	25.2	31.8	19.0	23.9
W4	14,182	13.8	52.6	21.8	11.7

Source: U.S. Census Bureau, American Community Survey 2010 to 2014 5-year estimates, Table B01001
[a] No block groups were analyzed for Segment 2 because all block groups that fall within Segment 2 are summarized in adjacent segments. See Appendix E for analysis methodology.

Segment 1. Overall, Segment 1 action corridor alternatives demonstrate similar age characteristics, with approximately 55 percent of residents between 18 and 64 years of age, approximately 25 percent under 18 years of age, and approximately 20 percent over 65 years of age.

Segment 2. No block groups were analyzed for Segment 2 because all block groups that fall within Segment 2 are summarized in adjacent segments. See Appendix E for a detailed description of the analysis methodology.

Segment 3. In Segment 3, the E3a, E3b, E3c, and E3d Alternatives demonstrate similar age characteristics, with approximately 20 percent under 18 years of age, about 50 percent between 18 and 64 years of age, and approximately 30 percent over 65. The W3 Alternative has about 31 percent under 18 years of age, about 51 percent between 18 and 64 years of age, and about 19 percent over 65.

Segment 4. In Segment 4, the E4 Alternative has a higher percentage of residents under 18 years of age (25 percent), while the W4 Alternative has a lower percentage (14 percent). The E4 Alternative has a lower percentage of residents between 18 and 64 years of age (50 percent), while the W4 Alternative has a higher percentage (75 percent). The E4 Alternative also has a higher percentage of residents over 65 years of age (24 percent), while the W4 Alternative has a lower percentage (12 percent).

Employment

Approximately 60 percent or more of Maricopa County and Arizona residents 16 years of age and older are in the labor force, whereas approximately 50 percent of Pinal County residents are employed (Table 3.3-6). Among study area municipalities, Eloy and Florence have the lowest share of residents in the labor force (24 and 21 percent, respectively), although over 70 percent are between 18 to 65 years of age. This is likely a result of the large prison populations in these areas. Apache Junction and Eloy have the highest unemployment rates (approximately 14 percent), while Florence, Mesa, and Queen Creek report unemployment rates near or below the rates in Maricopa and Pinal Counties.

Table 3.3-6. Labor force characteristics in the region

Geographic area	Total population 16 years of age and older[a]			Civilian labor force[b]		
	Total population	In the labor force (%)	Not in the labor force (%)	Total civilian labor force	Employed (%)	Unemployed (%)
Arizona	5,207,123	59.7	40.3	3,076,629	91.1	8.9
Maricopa County	3,115,673	63.5	36.5	1,968,588	92.3	7.7
Pinal County	302,678	49.7	50.3	150,055	89.3	10.7
Apache Junction	30,112	43.0	57.0	12,955	85.5	14.5
Mesa	358,227	62.3	37.7	222,837	92.2	7.8
Queen Creek	19,286	67.7	32.3	13,058	97.1	2.9
Florence[c]	27,166	20.7	79.3	5,627	92.8	7.2
Coolidge	8,871	52.6	47.4	4,670	87.8	12.2
Eloy[c]	14,314	24.3	75.7	3,479	85.7	14.3

Source: U.S. Census Bureau, American Community Survey 2011 to 2015 5-year estimates, Table B23025

[a] The prison population is not included in the labor force.

[b] Employment in the armed forces is not included in the civilian labor force.

[c] Florence and Eloy have incarcerated populations not in the labor force that may skew the data for these jurisdictions.

Employment characteristics in the study area are shown in Table 3.3-7 and discussed below.

Segment 1. In Segment 1, the action corridor alternatives all demonstrate similar employment characteristics, with approximately 55 percent of the total population 16 years of age and over in the labor force and approximately 9 to 11 percent unemployed.

Segment 2. No block groups were analyzed for Segment 2 because all block groups that fall within Segment 2 are summarized in adjacent segments. See Appendix E for a detailed description of the analysis methodology.

Segment 3. In Segment 3, between 38 and 48 percent of the population 16 years of age and over is in the labor force for all action corridor alternatives, while the unemployment rates range between 8 and 11 percent.

Segment 4. In Segment 4, the E4 Alternative has a higher percentage of the population 16 years of age and over that is in the labor force (47 percent), while the W4 Alternative has a low percentage (16 percent). Unemployment rates range between 6 and 8 percent.

Table 3.3-7. Labor force characteristics in the study area

Action corridor alternative	Total population 16 years of age and older[a]			Civilian labor force[b]		
	Total population	In the labor force (%)	Not in the labor force (%)	Total civilian labor force	Employed (%)	Unemployed (%)
Segment 1						
E1a	24,222	55.0	45.0	13,274	89.5	10.5
E1b	20,954	53.6	46.4	11,218	88.7	11.3
W1a	20,137	54.1	45.9	10,860	91.4	8.6
W1b	25,657	54.8	45.2	14,025	90.4	9.6
Segment 2[c]						
E2a, E2b, W2a, W2b	—	—	—	—	—	—
Segment 3[d]						
E3a, E3c	8,768	45.7	54.3	3,414	88.4	11.6
E3b, E3d	10,482	38.2	61.8	4,004	92.1	7.9
W3	8,606	48.8	51.2	4,202	90.0	10.0
Segment 4[d]						
E4	3,851	47.6	52.4	1,812	94.0	6.0
W4	12,465	16.6	83.4	2,065	92.0	8.0

Source: U.S. Census Bureau, American Community Survey 2011 to 2015 5-year estimates, Table B23025

[a] The prison population is not included in the labor force.

[b] Employment in the armed forces is not included in the civilian labor force.

[c] No block groups were analyzed for Segment 2 because all block groups that fall within Segment 2 are summarized in adjacent segments. See Appendix E for analysis methodology.

[d] Florence and Eloy have incarcerated populations not in the labor force that may skew the data for these jurisdictions.

Income and Poverty

Table 3.3-8 shows the median household income and percentage of individuals with income below the federal poverty level in the region. Additional information specific to poverty levels and the spatial distribution of people with incomes below the poverty level is presented in Section 3.17, *Environmental Justice and Title VI*.

Maricopa and Pinal Counties and Arizona have median household incomes of approximately $50,000 per year. Mesa and Florence household incomes are similar to the state and county; however, Queen Creek has a substantially higher median household income ($83,678) and Eloy and Apache Junction have much lower median household incomes ($31,033 and $35,671, respectively).

Table 3.3-8 shows that approximately 17 percent of individuals in Maricopa and Pinal Counties have incomes below the federal poverty level. These percentages are slightly lower than that for the state of Arizona. Apache Junction, Coolidge, and Eloy have much higher percentages of incomes below the poverty level (24, 27, and 36 percent, respectively), while Queen Creek has the lowest percentage (9 percent).

Table 3.3-8. Median household income and individuals below poverty level in the region

Geographic area	Median household income ($)	Persons for whom poverty is determined	Persons below poverty level (%)[a]
Arizona	50,255	6,488,917	18.2
Maricopa County	54,229	3,965,553	17.0
Pinal County	49,477	365,192	17.3
Apache Junction	35,671	36,172	24.0
Mesa	48,809	455,299	16.5
Queen Creek	83,678	30,068	8.6
Florence[b]	47,891	16,864	16.8
Coolidge	39,621	11,857	27.4
Eloy[b]	31,033	9,537	36.2

Source: U.S. Census Bureau, American Community Survey 2011 to 2015 5-year estimates, Table B17021, Table C17002

[a] Federal poverty levels are assigned by age and household size. 2015 levels include $11,770 income for an individual under 65 and approximately $24,250 for a family of four (U.S. Census 2015 Poverty Thresholds, Table 2014). From http://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html, accessed November 2017.

[b] Florence and Eloy have incarcerated populations with zero to very low income that may skew the data for these jurisdictions.

Income and poverty characteristics of the study area are shown in Table 3.3-9 and discussed below.

Segment 1. Median household income is higher in the E1a and E1b Alternatives (approximately $53,000), and ranges from approximately $43,000 to $47,000 in the W1b and W1a Alternatives, respectively. The Segment 1 action corridor alternatives demonstrate similar poverty rates (approximately 11 percent).

Segment 2. No block groups were analyzed for Segment 2 because all block groups that fall within Segment 2 are summarized in adjacent segments. See Appendix E for a detailed description of the analysis methodology.

Segment 3. The highest median household incomes are similar in the E3b, E3d, and W3 Alternatives (approximately $52,000 to $53,000), and approximately $48,000 in the E3a and E3c Alternatives. The E3a

and E3c Alternatives have the highest poverty rate, at approximately 20 percent, while poverty rates in the E3b, E3d, and W3 Alternatives range from 15 to 17 percent.

Segment 4. In Segment 4, the E4 Alternative has a higher median household income of approximately $41,000, while the W4 Alternative has a lower median household income (approximately $30,000). The poverty rate in the E4 Alternative is approximately 22 percent, compared with 37 percent for the W4 Alternative.

Table 3.3-9. Median household income and individuals below poverty level in the study area

Action corridor alternative	Median household income ($)	Persons for whom poverty is determined	Persons below poverty level (%)
Segment 1			
E1a	53,394	31,919	11.8
E1b	53,270	27,062	11.7
W1a	47,241	27,083	11.1
W1b	43,304	33,545	11.8
Segment 2[a]			
E2a, E2b, W2a, W2b	—	—	—
Segment 3[b]			
E3a, E3c	48,354	10,043	20.0
E3b, E3d	53,085	12,376	15.3
W3	52,311	11,986	16.9
Segment 4[b]			
E4	41,536	4,770	22.3
W4	30,748	6,703	37.0

Source: U.S. Census Bureau, American Community Survey 2011 to 2015 5-year estimates, Table B17021, Table C17002

[a] No block groups were analyzed for Segment 2 because all block groups that fall within Segment 2 are summarized in adjacent segments. See Appendix E for analysis methodology.

[b] Florence and Eloy have incarcerated populations with zero to very low income that may skew the data for these jurisdictions. Additionally, some block groups did not have available data for these populations.

Housing

Arizona and Maricopa County have housing occupancy rates greater than 80 percent, as do Coolidge, Eloy, and Mesa (Table 3.3-10). Apache Junction and Florence have rates of approximately 73 percent, which are slightly lower than Pinal County as a whole (78 percent). Approximately 60 to 70 percent of the occupied units in Maricopa and Pinal Counties and Arizona are owner-occupied. Among the study area municipalities, Queen Creek has the highest occupancy rate (88 percent). Of the occupied housing units, Mesa has the lowest percentage of owner-occupied units (60 percent) and Queen Creek has the highest percentage (79 percent). The average household sizes range from 2 to 4 people, with renter-occupied households generally having slightly larger household sizes.

Table 3.3-10. Housing tenure and average household size in the region

Geographic area	Housing units			Owner- and renter-occupied housing units			Average household size	
	Total	Occupied (%)	Vacant (%)	Occupied	Owner-occupied (%)	Renter-occupied (%)	Owner-occupied	Renter-occupied
Arizona	2,890,664	83.4	16.6	2,412,212	62.8	37.2	2.67	2.72
Maricopa County	1,668,555	86.5	13.5	1,442,518	60.7	39.3	2.74	2.76
Pinal County	163,490	78.1	21.9	127,599	72.2	27.8	2.71	3.28
Apache Junction	21,766	73.2	26.8	15,933	71.2	28.8	2.22	2.46
Mesa	200,782	84.1	15.9	168,914	60.2	39.8	2.67	2.74
Queen Creek	10,002	87.6	12.4	8,758	79.5	20.5	3.37	3.71
Florence[a]	9,319	73.3	26.7	6,832	71.8	28.2	2.46	2.54
Coolidge	4,688	81.2	18.8	3,806	59.7	40.3	2.86	3.55
Eloy[a]	3,953	82.0	18.0	3,241	63.8	36.2	2.92	3.04

Source: U.S. Census Bureau, American Community Survey 2011 to 2015 5-year estimates, Table B25002, Table B25003, Table B25010
[a] Florence and Eloy have incarcerated populations that live in group quarters, not households, that may skew the data for these jurisdictions.

Housing tenure and household size for the study area are shown in Table 3.3-11. Discussions of key housing characteristics are below.

Segment 1. In Segment 1, the W1b Alternative has the most housing units (15,392), and the W1a Alternative has the lowest vacancy percentage (20 percent). The E1a and E1b Alternatives have vacancy rates of 23 and 24 percent, respectively. The majority of housing units in all action corridor alternatives are owner-occupied (approximately 78 percent) with household sizes ranging from 2 to 3 persons per household.

Segment 2. No block groups were analyzed for Segment 2 because all block groups that fall within Segment 2 are summarized in adjacent segments. See Appendix E for a detailed description of the analysis methodology.

Segment 3. In Segment 3, the E3b and E3d Alternatives have the most housing units (7,353) and the highest vacancy percentage (30 percent). The owner occupancy rate in Segment 3 ranges from 68 to 76 percent, and the average household sizes range between 3.5 and 3.8 persons per household.

Segment 4. In Segment 4, the W4 Alternative has the most housing units (2,975) and the highest vacancy percentage (21 percent). The E4 Alternative has a higher owner occupancy rate of approximately 80 percent, while the W4 Alternative has a rate of approximately 67 percent. The average household sizes range from 2 to 3 persons per household.

Table 3.3-11. Housing tenure and average household size in the study area

Action corridor alternative	Housing units			Owner- and renter-occupied housing units			Average household size	
	Total	Occupied (%)	Vacant (%)	Occupied	Owner-occupied (%)	Renter-occupied (%)	Owner-occupied	Renter-occupied
Segment 1								
E1a	14,799	77.2	22.8	11,420	77.9	22.1	2.71	2.97
E1b	13,244	75.8	24.2	10,043	78.9	21.1	2.67	2.83
W1a	11,824	80.0	20.0	9,462	77.8	22.2	2.58	2.81
W1b	15,392	78.2	21.8	12,032	77.6	22.4	2.67	2.85
Segment 2[a]								
E2a, E2b, W2a, W2b	—	—	—	—	—	—	—	—
Segment 3[b]								
E3a, E3c	5,898	71.7	28.3	4,231	68.7	31.3	2.45	2.74
E3b, E3d	7,353	70.0	30.0	5,149	76.0	24.0	2.53	2.66
W3	5,156	77.0	23.0	3,968	75.0	25.0	2.88	3.82
Segment 4[b]								
E4	2,215	80.3	19.7	1,779	80.2	19.8	2.55	3.14
W4	2,975	78.6	21.4	2,337	66.6	33.4	2.26	2.54

Source: U.S. Census Bureau, American Community Survey 2011 to 2015 5-year estimates, Table B25002, Table B25003, Table B25010
[a] No block groups were analyzed for Segment 2 because all block groups that fall within Segment 2 are summarized in adjacent segments. See Appendix E for analysis methodology.
[b] Florence and Eloy have incarcerated populations that live in group quarters, not households, that may skew the data for these jurisdictions.

3.3.3.2 Community Facilities and Services

Community facilities and services include those organizations, both public and private, that fulfill a social function or provide services to the community. Community facilities and services include schools, colleges, and libraries; hospitals, health care facilities, and nursing homes; police, fire, and emergency medical services; municipal services and other civic institutions; religious institutions; and parks and recreational facilities. This section provides an overview of community facilities and services within 0.5 mile of the action corridor alternatives. Parks and recreational facilities, as well as other open space resources, are discussed separately in Section 3.5, *Parkland and Recreational Facilities*.

Table 3.3-12 lists the community facilities and services within 0.5 mile of the action corridor alternatives in each segment. These resources are generally concentrated close to incorporated municipalities (Figures 3.3-1 and 3.3-2).

Table 3.3-12. Community facilities within 0.5 mile of action corridor alternatives

Action corridor alternative	Educational	Municipal	Social	Medical	Religious	Other
Segment 1						
E1a	None	None	None	None	Mountain View Lutheran Church	Rittenhouse Army Heliport
E1b	None	None	None	None	Mountain View Lutheran Church	None
W1a	Apache Junction High School, Cactus Canyon Junior High School, Mountain Shadows Education Center, Apache Junction Unified School District	None	Apache Junction Multi-generational Center	None	None	Rittenhouse Army Heliport
W1b	None	None	None	None	Mountain View Lutheran Church	Rittenhouse Army Heliport
Segment 2						
E2a, E2b, W2a, W2b	None	None	None	None	None	None
Segment 3						
E3a, E3c	None	Town of Florence (Town Hall, Elections Department, Post Office, Fire Department)	None	None	None	Adamsville Cemetery
E3b, E3d	None	None	None	None	None	None
W3	None	None	None	None	Calvary Coolidge Church	None
Segment 4						
E4	None	Kenilworth School	None	None	None	None
W4	None	None	None	None	None	Eloy Memorial Park

Figure 3.3-1. Community facilities and services, Segments 1 and 2

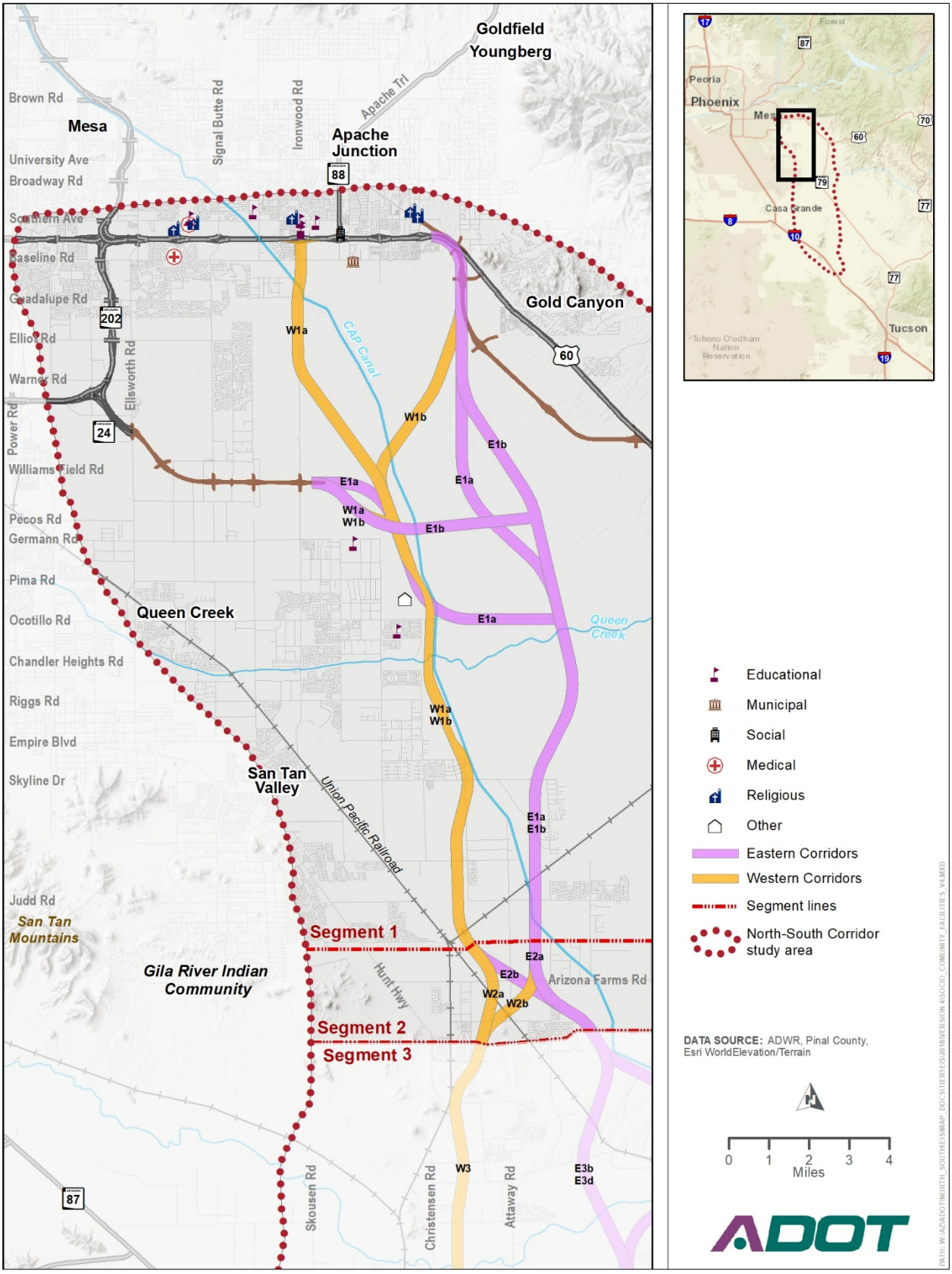
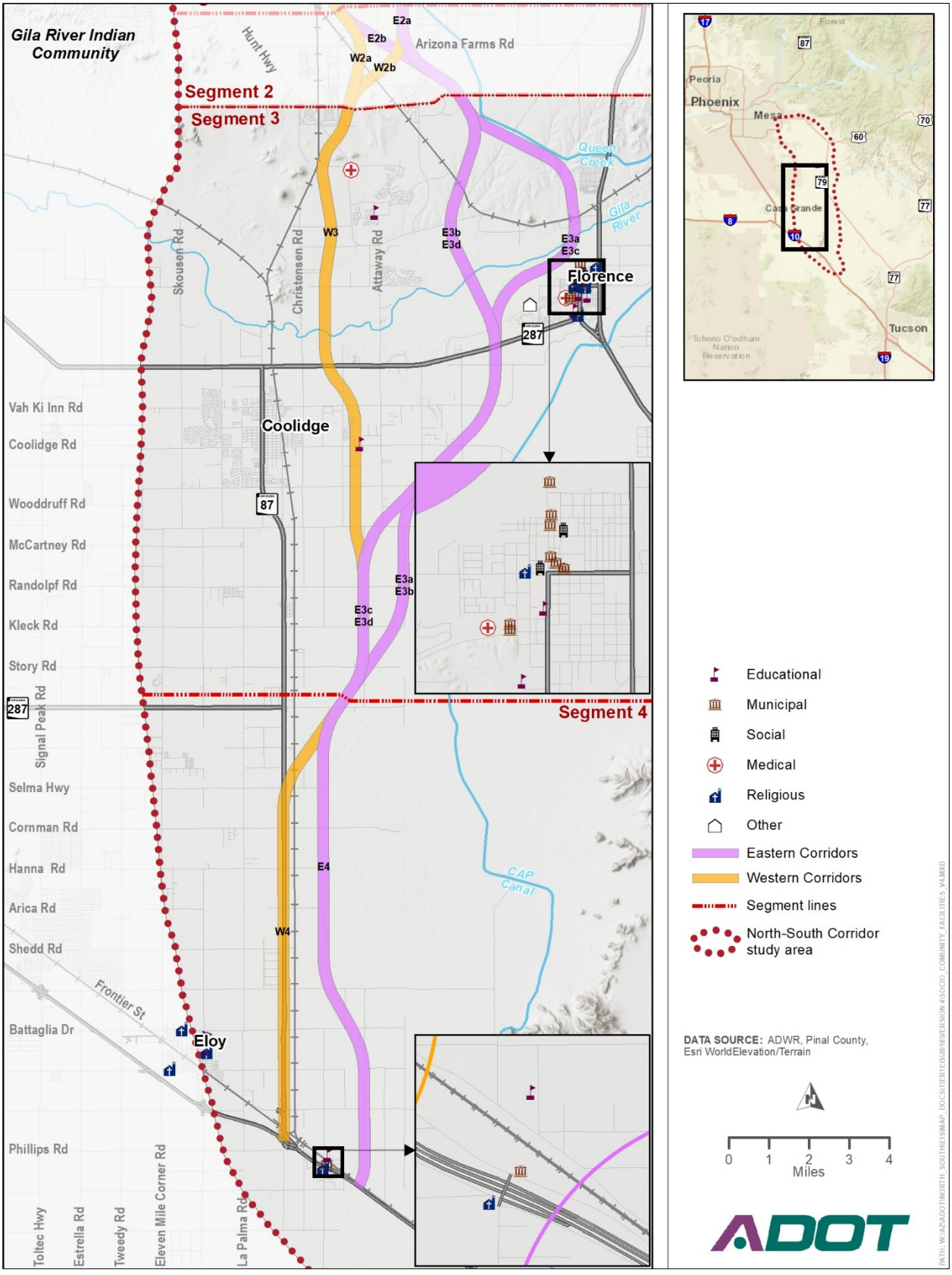


Figure 3.3-2. Community facilities and services, Segments 3 and 4



3.3.4 Environmental Consequences

The action corridor alternatives' anticipated impacts on social conditions, particularly as they pertain to community character and cohesion, are discussed below. The analysis assumed that land use conversions would occur by 2040 for both the action corridor alternatives and the No-Action Alternative, as described in Section 3.2, *Land Use*.

3.3.4.1 No-Action Alternative

Because of their proximity to Phoenix and Tucson, Pinal County and the study area have become focal points for future development and economic growth in the Sun Corridor. Table 3.3-13 summarizes existing and projected population and employment for geographies in the approximately 900-square-mile study area described in Section 3.2, *Land Use*. Under existing conditions, population and employment data are based on currently incorporated municipal boundaries. Future conditions are based on currently identified MPA boundaries. High population and employment projections are attributable to new growth and, in some cases, annexation of already developed land in Pinal County.

Table 3.3-13 shows the population is projected to increase by almost 118 percent by 2040. The table also shows that employment growth is anticipated to be substantial, growing by 347 percent by 2040 through the creation of over 160,000 new jobs.

Table 3.3-13. Existing and projected population and employment for geographies in study area, 2015 to 2040

Geographic area	2015 population[a]	2040 population[a]	Percentage change	2015 employment[a]	2040 employment[a]	Percentage change
Pinal County	163,972	377,964	131	16,838	92,115	447
Maricopa County	111,685	223,089	100	19,578	70,570	260
Total	**275,657**	**601,053**	**118**	**36,416**	**162,685**	**347**

Source: 2015 and 2040 population and employment estimates and projections, second-generation Arizona statewide travel demand model (AZTDM2).

[a] Population and employment projections are reported for traffic analysis zones in the approximately 900-square-mile study area identified in Section 3.2, *Land Use*, as compared with the full extent of county boundaries.

The large increase in population and employment in the study area demonstrates a substantial shift from agricultural and undeveloped land uses to primarily residential and commercial land uses. In these areas, the social fabric has historically centered on agricultural activities. While agricultural activities align with low population density, agricultural neighborhoods generally have community cohesion as a result of a common lifestyle.

Under the No-Action Alternative, new low-capacity roadways would be introduced to help support planned development. The No-Action Alternative also includes improvements to regionally significant routes (see Chapter 2, *Alternatives*). However, congestion levels on existing roadways and the lack of connectivity in the study area to existing and planned community facilities have the potential to adversely affect the quality of life of area residents and the ability to attract new economic activity. The No-Action Alternative has the potential to reduce the attractiveness of the study area as a place to live, work, and play because of increased congestion associated with projected development.

3.3.4.2 Action Corridor Alternatives

The proposed action corridor alternatives have the potential to adversely affect social conditions through changes in community character and accessibility, fragmentation of communities, and alteration of community cohesion. Although the exact nature of impacts related to social conditions that could result from implementing the proposed action would vary (depending on whether an action corridor alternative becomes the preferred alternative), all action corridor alternatives have the potential to affect social conditions (Figures 3.3-1 and 3.3-2). While much of the study area is undeveloped or farmland, implementing the proposed action could directly and indirectly affect established resources such as neighborhoods, schools, religious institutions, and businesses. However, all action corridor alternatives would also provide community benefits in the form of improved mobility and access for residents across the region. Improved mobility would reduce travel times, which would improve emergency vehicle access times, access to jobs, and access to community facilities and services.

This evaluation considered how the action corridor alternatives could enhance or reduce access to community facilities and organizations, both public and private, that fulfill a social function or provide services to the community, including schools, colleges, and libraries; hospitals, health care facilities, and nursing homes; police, fire, and emergency medical services; municipal services and other civic institutions; religious institutions; and parks and recreational facilities. Because the study area is mostly undeveloped, impacts on social conditions would be limited to specific locations where existing communities or facilities are located and would be directly affected by one of the action corridor alternatives. These locations include the following:

- In Segment 1, the W1a Alternative would reduce access to existing schools with the introduction of the access-controlled transportation facility and system traffic interchange with US 60 that has the potential to divide communities and affect local access. The E1a, W1a, and W1b Alternatives would reduce access to an existing airfield.
- In Segment 2, no community facilities would be affected by or benefit from the E2a, E2b, W2a, or W2b Alternatives.
- In Segment 3, the E3a and E3c Alternatives would enhance access to community facilities in Florence for areas to the north and for other neighboring communities by providing a direct north-to-south travel option without dividng existing communities; however, most community facility use in this segment would originate in Florence. The W3 Alternative would either directly affect an existing church located within the 1,500-foot corridor or potentially reduce access to the church if the Corridor were to avoid the church and be located between the majority of the local population and the church. The E3b or E3d Alternatives would not divide existing communities; however, no community facilities would be affected by or benefit from either alternative.
- In Segment 4, community facilities are located in the likely footprint of a system traffic interchange with I-10 for both the E4 and W4 Alternatives.

3.3.5 Potential Avoidance, Minimization, and Mitigation Strategies

Potential measures to mitigate adverse impacts on social conditions include:

- ADOT would coordinate with municipal and County partners and affected communities to address concerns regarding the internal roadway network, connectivity with the freeway, and potential grade separations at non-interchange locations to improve local and regional connectivity.
- ADOT would coordinate with municipal and County partners as development occurs to fully integrate the freeway into the regional transportation network.

- ADOT would build upon public involvement efforts undertaken for the NSCS to engage study area residents in the EIS process to help understand community access, connectivity, and circulation concerns and opportunities.

Appendix D, *Summary of Avoidance, Minimization, and Mitigation Strategies*, contains a consolidated list of strategies to address environmental impacts.

3.3.6 Subsequent Tier 2 Analysis

No issues related to social conditions have been identified that would preclude constructing the proposed action in any of the action corridor alternatives. However, social conditions need to be considered in the Tier 2 phase and in final design, should an action corridor alternative become the preferred alternative.

The Tier 2 analysis should include updated documentation (based on the most recent U.S. Census data) of the region's existing demographic characteristics and study area populations, including population trends, race and ethnicity, age, employment, income, and housing. Subsequent analyses should also include updated documentation of existing community facilities and services in the study area, followed by a detailed assessment of the anticipated effects on these resources as a result of the proposed action.

3.3.6.1 Conclusion

Because the study area is mostly undeveloped, effects on social conditions in the study area would be limited to specific locations where existing communities or facilities would be directly affected by one of the action corridor alternatives. For Segment 1, the W1a Alternative has the potential to reduce access to existing schools, and the E1a, W1a, and W1b Alternatives would reduce access to an existing airfield. For Segment 2, no community facilities would be affected by or benefit from the E2a, E2b, W2a, or W2b Alternatives. For Segment 3, the E3a and E3c Alternatives would enhance access to community facilities in Florence for areas to the north and for other neighboring communities, the W3 Alternative would either directly affect or reduce access to an existing church, and no community facilities would be affected by or benefit from the E3b or E3d Alternatives. For Segment 4, community facilities are located in the likely footprint of a system traffic interchange with I-10 for both the E4 and W4 Alternatives.

All segments would benefit from implementing any of the action corridor alternatives because each would improve regional connectivity, reduce travel times, and provide enhanced access to jobs, community resources, and other destinations for both existing and future populations.

3.4 Economics

The study area is part of a single megaregion connecting Phoenix and Tucson (as described in Chapter 1, *Purpose and Need*). Section 3.2, *Land Use*, documents the future land use for the study area. Since the majority of the land potentially affected by the action corridor alternatives is ultimately identified for development, the analysis considers the impacts the action corridor alternatives and the No-Action Alternative could have on tax revenues. This analysis did not attempt to quantify the economic impact on business revenue, wages, and jobs. At the corridor level, these results would be speculative.

For this analysis, the 1,500-foot-wide action corridor alternatives were considered (in terms of overall acres affected, an actual alignment would be determined in subsequent Tier 2 studies).

If the proposed action were built, some properties that are currently taxable would be converted to a nontaxable transportation use. As a result, property taxes would no longer be collected from those properties. The economic impacts study also considered potential loss of tax revenues associated with the conversion of productive agricultural land in the Corridor to a transportation use. Few nonagricultural businesses exist in the corridor, and information related to specific retail sales for those entities is limited. As a result, retail sales tax revenues for those businesses were not included in the analysis. The limited amount of existing commercial activity indicates a low likelihood of any adverse impacts on local nonagricultural businesses in the area.

3.4.1 Regulatory Context

Potential impacts on property and sales tax revenues were evaluated to comply with Title I, Section 101(a), of NEPA to "fulfill the social, economic and other requirements of present and future generations of Americans." The evaluation considers the change in available tax-generating land and the impacts on the overall economy. Specific details regarding parcel-level and land use impacts are discussed in Section 3.2, *Land Use*.

3.4.2 Methodology

Property and sales tax revenue losses would most likely occur in the municipalities of Apache Junction, Queen Creek, Florence, Coolidge, and Eloy, and in unincorporated portions of Pinal County. Sales tax revenue would be lost when taxable agricultural production land is converted to nontaxable transportation use land under the action corridor alternatives. To evaluate potential adverse tax revenue impacts, the market value for the land that would be converted to highway use was applied to current property tax rates in the specified area. Taxable land uses in the study area include residential, commercial, industrial, and agricultural land.

3.4.2.1 Fiscal Economic Impact Assumptions

Tax generation data used in the analysis were extracted from the Pinal County Assessor's database. The analysis examined the full cash values and limited cash values that are used to calculate property tax; these values are readily available from the County Assessor. The full and limited cash values are calculated based on market value using complex formulas.

The average full and limited cash values were determined by examining the averages of parcels with available Assessor data in the 1,500-foot-wide action corridor alternatives. These property values were converted to a per-acre average and were then used to calculate the probable economic impacts of each action corridor alternative. The average of all available parcel values for the potentially affected land was calculated for each land use type under consideration.

The 2017 assessment ratio for each land use type was considered (Table 3.4-1). The assessment ratio for commercial and industrial land was updated to the long-term value of 18 percent, in effect as of December 31, 2015. Vacant or undeveloped land was valued to reflect its zoning.

The tax rate applied to calculate property tax impacts was updated using the 2017 levies and was separated into primary and secondary rates. Because each action corridor alternative overlaps multiple tax districts, the weighted average levy for each action corridor alternative was used to determine the average primary and secondary rates to be applied to calculate the primary and secondary taxes per acre by jurisdiction. The calculations in Table 3.4-1 reflect the expected average per-acre tax rate for representative properties affected by the action corridor alternatives.

Table 3.4-1. Land valuation assumptions and tax rates used to estimate action corridor alternatives' property tax impacts

Area	Land use				
	Agricultural	Commercial	Industrial	Residential	Vacant/ Undeveloped
Market value					
Full cash value for tax purposes (80% of market value, $)	546	80,027	15,167	19,928	1,723
Limited value (95% of full cash value, $)	518	76,026	14,408	18,932	1,637
Assessment ratio	0.15	0.18	0.18	0.10	0.15
Assessed valuation for primary tax levies ($)	78	13,685	2,593	1,893	246
Assessed valuation for secondary tax levies ($)	82	14,405	2,730	1,993	259
Primary tax rate ($ per $100 of assessed value)					
Apache Junction	10.47	10.47	10.47	10.47	10.47
Queen Creek	—[a]	—	—	—	—
Florence	11.32	11.32	11.32	11.32	11.32
Coolidge	13.30	13.30	13.30	13.30	13.30
Eloy	11.46	11.46	11.46	11.46	11.46
Unincorporated	10.73	10.73	10.73	10.73	10.73
Secondary tax rate ($ per $100 of assessed value)					
Apache Junction	5.42	5.42	5.42	5.42	5.42
Queen Creek	—	—	—	—	—
Florence	2.43	2.43	2.43	2.43	2.43
Coolidge	1.94	1.94	1.94	1.94	1.94
Eloy	4.70	4.70	4.70	4.70	4.70
Unincorporated	2.32	2.32	2.32	2.32	2.32

Table 3.4-1. Land valuation assumptions and tax rates used to estimate action corridor alternatives' property tax impacts

Area	Land use				
	Agricultural	Commercial	Industrial	Residential	Vacant/ Undeveloped
Primary taxes per acre ($)					
Apache Junction	8.14	1,432.26	271.44	198.14	25.70
Queen Creek	—	—	—	—	—
Florence	8.80	1,548.49	293.47	214.22	27.79
Coolidge	10.34	1,820.23	344.97	251.81	32.67
Eloy	8.91	1,568.63	297.28	217.01	28.15
Unincorporated	8.34	1,468.02	278.22	203.09	26.35
Secondary taxes per acre ($)					
Apache Junction	4.44	780.83	147.98	108.02	14.01
Queen Creek	—	—	—	—	—
Florence	1.99	350.72	66.47	48.52	6.29
Coolidge	1.59	279.51	52.97	38.67	5.02
Eloy	3.85	677.74	128.44	93.76	12.16
Unincorporated	1.90	333.86	63.27	46.19	5.99

Sources: Pinal County assessor data, Pinal County treasurer; note that no taxable parcels in Queen Creek are in the 1,500-foot action corridor alternatives.

[a] not applicable; representative land in the study area did not provide basis for comparison

3.4.3 Affected Environment

The study area encompasses nearly 578,000 acres, most of which is vacant or undeveloped land in areas that are unincorporated. The primary use of developed land is for agricultural purposes, which accounts for approximately 107,000 of the nearly 578,000 acres.

3.4.4 Environmental Consequences

The following sections discuss the proposed action's potential impact on property and sales tax revenues under existing and future conditions.

3.4.4.1 No-Action Alternative

The No-Action Alternative assumes that existing land uses would remain as allocated and would develop according to land uses as envisioned by the governing planning agencies in their future land use plans.

3.4.4.2 Action Corridor Alternatives

Potential property and sales tax revenue impacts under the action corridor alternatives are discussed in the following sections. These alternatives assume that land uses under the No-Action Alternative would carry forward, with sections of land removed for construction of the proposed action.

Table 3.4-2 summarizes the total acreage of available land with taxable uses on parcels in the action corridor alternatives.

Table 3.4-2. Acreage of existing taxable land uses, by action corridor alternative

Action corridor alternative	Land use					Total
	Agricultural	Commercial	Industrial	Residential	Vacant/ Undeveloped	
Segment 1						
E1a	168	0	0	20	4,584	4,772
E1b	168	0	0	20	4,263	4,451
W1a	744	3	3	69	2,676	3,494
W1b	744	0	0	40	2,824	3,608
Segment 2						
E2a	454	0	0	2	57	514
E2b	612	0	0	0	57	669
W2a	374	0	1	0	103	479
W2b	436	0	29	2	94	560
Segment 3						
E3a	2,180	0	126	74	989	3,369
E3b	1,993	0	128	56	842	3,018
E3c	2,130	0	126	35	1,098	3,389
E3d	1,943	0	128	17	951	3,038
W3	1,615	0	69	23	1,045	2,751
Segment 4						
E4	1,619	0	14	15	632	2,280
W4	1,405	0	98	136	447	2,087

Source: analysis of action corridor alternatives and existing land uses, using Pinal County Assessor data

The table highlights only taxable uses, because the assumption is that the following land uses would not generate substantial tax revenues:

- institutional or other public land – generally reserved for public purposes; not subject to property taxes and does not generate sales tax revenue
- park land and open space – typically public lands; not considered as part of the tax base
- transportation land – includes existing public ROW used as streets, roads, and highways; excluded from the tax base

Consistent with the study area's primarily rural nature, most of the taxable land in each action corridor alternative is either vacant/undeveloped or agricultural (Table 3.4-2). Note that the action corridor alternatives each encompass more land than would be directly affected by a Tier 2 alignment.

Absent the proposed action, this land would generate tax revenues under its existing use type, but would transition to nontaxable transportation land under the noted action corridor alternative. Because not all land in the action corridor alternative would be acquired, the impacts of the action corridor alternatives are greater than the likely impacts of a Tier 2 alignment.

Property Tax Impacts, Existing Conditions

Table 3.4-3 presents the estimated property tax reductions that could be expected for each land use type by each action corridor alternative. This provides an estimate of the likely change in property tax income caused by converting taxable land uses to nontaxable transportation uses (however, an alignment may be located anywhere in the action corridor alternative). The estimates are based on existing land uses, land values, and tax rates, and are presented in 2016 dollars.

Table 3.4-3. Detailed property tax impacts ($) of 1,500-foot action corridor alternatives, existing land uses

Action corridor alternative	Land use					Total
	Agricultural	Commercial	Industrial	Residential	Vacant/ Undeveloped	
Segment 1						
E1a	0	0	0	5,072	148,246	153,319
E1b	0	0	0	5,072	137,860	142,932
W1a	0	4,696	1,030	17,222	86,715	109,663
W1b	0	0	0	9,953	91,493	101,447
Segment 2						
E2a	0	0	0	637	1,847	2,483
E2b	0	0	0	58	1,847	1,905
W2a	0	0	441	0	3,344	3,786
W2b	0	0	10,266	637	3,040	13,943
Segment 3						
E3a	0	0	43,140	18,568	32,211	93,918
E3b	0	0	43,677	13,871	27,444	84,992
E3c	0	0	43,140	8,863	36,316	88,319
E3d	0	0	43,677	4,166	31,549	79,393
W3	0	0	23,393	6,206	34,589	64,188
Segment 4						
E4	123	0	5,919	3,753	24,667	34,462
W4	0	0	40,693	35,597	17,270	93,560

Source: analysis of action corridor alternatives and existing land uses

Table 3.4-3 reflects the affected land identified in Table 3.4-2 valued and assessed at the rates shown in Table 3.4-1 to calculate the loss in tax revenues associated with the removal of taxable land acquired for ROW for each action corridor alternative in the Corridor.

Property tax impacts for Segment 1 are consistent with expectations based on the total acreage. The land in the area is primarily vacant or undeveloped, and the E1a Alternative would result in the largest reduction in potential future revenue. The ultimate impacts would depend on the Tier 2 alignment.

In Segment 2, the W2b Alternative would have the highest tax impact, despite not having the highest land impact. This is because industrial land, which generates high revenue per acre, would be converted to transportation, which generates no revenue.

Impacts on tax revenue in the Segment 3 range by nearly 50 percent, with the W3 Alternative resulting in the smallest impact. Each action corridor alternative would primarily affect unincorporated areas, with some modest impacts on Coolidge.

The W4 Alternative would have larger tax impacts than the E4 Alternative, with most of the impacts on land in Eloy and residential land in unincorporated areas of Pinal County. The tax impacts would differ depending on the final Tier 2 alignment.

Sales Tax and Farm Revenue Impacts, Existing Conditions

In many locations, retail sales are from businesses on commercial or industrial land, with commercial land experiencing greater impacts than industrial land. There are 722 acres of industrially zoned land in the action corridor alternatives that would be potentially affected. The maximum impact of any single action corridor alternative would be 35 acres. Given the small impact, the overall impact on sales tax would be negligible.

The losses associated with losing agricultural land are a consideration. Two primary agriculture uses exist in the study area—field crop production and land used for livestock. In the study area, approximately 78 percent of the potentially affected agricultural land is used for grazing or ranchland and the remaining 22 percent is used for crop production.

According to the 2012 Census of Agriculture (U.S. Department of Agriculture 2014), the primary crops grown in Pinal County are cotton, hay, wheat, corn, and barley. These commodities accounted for nearly 229,000 of the almost 241,000 acres of field crops harvested in the county. The exact nature of the crops in the action corridor alternatives is unknown, so a weighted average of expected yields and sale prices was calculated to estimate the expected lost value from farm production attributable to the loss of cropland for ROW acquisition. Average yield per acre was generated using average yield per acre in Pinal County from 2012 to 2016, based on the Census of Agriculture. (Note that not all commodities were available for every year during this time period.) Table 3.4-4 shows the assumed mix of field crops, their yields, and sale prices.

Table 3.4-4. Field crops, yields, and prices

Crop	Yield per acre	Units	Average price per unit ($)	Assumed share of study area (%)
Barley	119.2	Bushels	4.71	10.74
Corn – grain	201.4	Bushels	5.74	1.42
Corn – silage	29.6	Tons	4.83	8.57
Cotton – Pima	982.2	Pounds	1.20	1.86
Cotton – upland	1,507.6	Pounds	0.72	38.76
Alfalfa hay	8.4	Tons	191.40	28.31
Wheat – spring durum	101.4	Bushels	7.92	9.65
Wheat – winter	100.5	Bushels	8.49	0.68

Sources: U.S. Department of Agriculture National Agricultural Statistics Service 2016 State Agriculture Overview for Arizona; National Agricultural Statistics Service Pinal County Data, U.S. averages for wheat, Pima cotton, and silage corn attributable to suppression in Arizona data

To approximate the agricultural losses associated with land takings, the information in Table 3.4-4 was applied to relevant parcel data for each action corridor alternative. Given a lack of additional detail, it is assumed that the general mix of agricultural uses in Pinal County applies to the study area. To determine the overall mix of use in the action corridor alternatives and the anticipated overall value of production, the analysis examined the impacts if every parcel were fully taken. Table 3.4-5 shows the analysis results.

Table 3.4-5. Lost crop production revenues, by action corridor alternative, existing land uses

Action corridor alternative	Full acreage of field crops	Total impact ($000s)
Segment 1		
E1a	558	597.5
E1b	558	597.5
W1a	222	237.8
W1b	425	454.3
Segment 2		
E2a	1,059	1,133.1
E2b	1,857	1,987.1
W2a	767	820.9
W2b	655	701.4

Table 3.4-5. Lost crop production revenues, by action corridor alternative, existing land uses

Action corridor alternative	Full acreage of field crops	Total impact ($000s)
Segment 3		
E3a	6,157	6,588.3
E3b	6,507	6,962.6
E3c	5,229	5,595.7
E3d	5,489	5,873.8
W3	2,348	2,512.3
Segment 4		
E4	968	1,035.5
W4	1,642	1,756.7

Future Land Use

Table 3.4-6 shows the future land use estimates for the action corridor alternatives. These estimates are based on land use data provided by the local planning agency, although no build-out date is projected for this information. Note that determining reductions in future property tax revenues for the action corridor alternatives based on land use plans is speculative, given the uncertainty associated with the timing of development.

The planned future land uses largely indicate a shift away from agricultural uses and toward primarily residential uses. The share of commercial land would increase, reflecting a shift from a rural environment to a more suburban environment.

The shift to developed and more intense land uses causes greater overall tax revenue impacts. The conversion of commercial and industrial land from taxable uses to transportation purposes also removes the possibility of earning sales and use taxes on those parcels. That could be offset by greater accessibility to the remaining parcels if an alternative were built, and any assessment of the potential loss in sales tax is purely speculative.

Property Tax Impacts, Future Conditions

The property tax impacts would be much greater than under the existing land uses, and any annexation of unincorporated areas may further increase the impacts if additional tax levies are enacted on those annexed properties.

Table 3.4-6. Future land use, by study area segment, 1,500-foot action corridor alternative, acres

Action corridor alternative	Land use					Total
	Agricultural	Commercial	Industrial	Residential	Public	
Segment 1						
E1a	0	1,138	79	3,401	265	4,883
E1b	0	983	79	3,190	199	4,451
W1a	9	961	208	2,316	120	3,614
W1b	0	958	208	2,385	114	3,664
Segment 2						
E2a	0	38	5	471	0	514
E2b	0	25	15	629	0	669
W2a	0	0	189	290	0	479
W2b	0	18	150	393	0	560
Segment 3						
E3a	293	1,107	137	1,488	343	3,369
E3b	293	1,026	58	1,507	134	3,018
E3c	426	495	137	1,987	343	3,389
E3d	426	414	58	2,006	134	3,038
W3	55	130	52	2,523	0	2,760
Segment 4						
E4	0	97	443	1,741	0	2,280
W4	0	471	640	820	129	2,060

Source: analysis of action corridor alternatives and future land uses

Sales Tax and Farm Revenue Impacts, Future Conditions

Similar to property taxes, larger impacts on retail sales would occur under future land use conditions than under existing land uses. Future land uses indicate a shift in land use, away from agriculture and toward residential, commercial, and industrial uses. These changes would cause a shift in area revenue sources, reducing agricultural-related revenues and increasing sales tax revenues associated with more retail and commercial activity. The development of commercial and industrial land would depend on demand, which may be impeded by congestion without the proposed action, possibly delaying the realization of sales tax revenues for the affected areas.

The agricultural impacts are greater under existing land uses than under planned future uses, where most agricultural land would be repurposed. Under future land uses, only Segment 3 would be affected by the loss of agricultural lands. According to its planning documents, the City of Coolidge intends to continue agricultural uses, which would be affected by the Eastern Alternatives.

Other Types of Fiscal Impacts

Other types of fiscal impacts were considered in this analysis, but were not estimated because they represent a relatively small portion of total revenues for the communities compared with the tax base, which was evaluated. Not considered, for example, were ecotourism impacts. In 2012, Pinal County, in partnership with The Trust for Public Land, prepared an analysis of the economic benefits of parks, trails, and open space in Pinal County. While the analysis quantified the benefits that parks, trails, and protected open space contribute to the local economy, these features would not be directly affected by the action corridor alternatives being evaluated (trails may be crossed by the facility, but these impacts could be avoided, minimized, and/or mitigated at the Tier 2 phase when the alignment is determined).

3.4.5 Potential Avoidance, Minimization, and Mitigation Strategies

The impact of land acquisition on property and sales taxes in the area could be mitigated as follows:

- Select action corridor alternatives that minimize full parcel takes.
- Position the freeway in the action corridor alternative in a manner that minimizes takes of taxable land.
- Select action corridor alternatives that minimize takes of land that is currently taxable.

Appendix D, *Summary of Avoidance, Minimization, and Mitigation Strategies*, contains a consolidated list of strategies to address environmental impacts.

3.4.5.1 Local Agency Mitigation Strategies

The following describes potential mitigation measures for local planning agencies to consider as future commitments to avoid, minimize, or mitigate adverse impacts on economic conditions that may result from implementing the proposed action:

- Rezone existing undeveloped land for other taxable uses that may compensate for lost tax revenue associated with the necessary takes.

3.4.6 Subsequent Tier 2 Analysis

The economic impacts of the selected alternative would be further analyzed in Tier 2 studies. This analysis would involve completing more detailed environmental investigations, including field studies and corresponding updates to impacts on social, economic, and environmental resources. Economic effects associated with business displacements and related economic effects would be addressed in Tier 2 analyses. At the Tier 2 level, potential mitigation strategies would be identified when the specifics of an alignment are known.

3.4.6.1 Conclusion

Recent growth rates indicate that much of the currently vacant land in the study area will convert to residential or commercial uses in the future, although the timing and location of these changes are uncertain. Coordination with local planning agencies regarding planned development and zoning can help alleviate some of the potential revenue losses associated with the proposed action. While land would need to be converted to a transportation use for construction of the proposed action, many of the impacts would likely affect currently undeveloped land. Over time, as the region continues to grow, it is expected that new development may actually increase overall property and sales tax revenues in the region as compared with today’s revenues.

3.5 Parkland and Recreational Facilities

This section provides an overview of the study area's parkland and recreational facilities and preliminary information concerning such facilities in the action corridor alternatives.

Parkland is generally defined as land that has been officially designated as a national, state, or local park by a federal, state, or local agency. Recreational facilities, such as trails or sports fields, may be located within parkland or may be independently located. For this Tier 1 DEIS, federal, state, local, and private parkland and recreational facilities in the study area were identified and assessed for potential impacts that would result from implementation of the proposed action.

3.5.1 Regulatory Context

Potential impacts on parkland and recreational facilities were evaluated in accordance with CEQ and FHWA regulations for NEPA implementation, as well as Section 4(f) of the Department of Transportation Act of 1966. Section 4(f) serves to preserve and protect public parks and recreational lands, wildlife and waterfowl refuges, and historic sites. Under Section 6(f) of the Land and Water Conservation Fund Act, conversions of park land that was developed using money from the Land and Water Conservation Fund to uses other than park or recreational uses would require that replacement lands of equivalent value and utility be provided. Section 3.19 of this Tier 1 DEIS provides additional information on Section 4(f) and Section 6(f), and an overview of potential impacts with the action corridor alternatives.

3.5.2 Methodology

The evaluation presented in this section was based on available information regarding existing and planned parks and recreational facilities in the study area. Data sources used to inventory parkland and recreational facilities in the study area included federal, state, and local websites and associated GIS data, where available.

Potential impacts on parks and recreational resources were assessed based on the quantity and type of resources included in the 1,500-foot-wide action corridor alternatives.

3.5.3 Affected Environment

3.5.3.1 Existing and Planned Parks and Recreational Facilities

Almost 50 existing and planned federal, county, municipal, and private parks, open space, recreation areas, and trails were found in the study area. Figures 3.5-1 and 3.5-2 show existing and planned parks and recreational facilities in the study area. Table 3.5-1 lists the parks and recreational facilities and their corresponding map numbers.

If the specific location of a planned park or recreational facility was identified, it was included on Figures 3.5-1 and 3.5-2. However, for some planned parks or recreational facilities, a specific location has not yet been identified. As a result, these facilities are noted with "none" in the map number column in Table 3.5-1. As shown on the figures, several existing multiuse trail corridors intersect the action corridor alternatives in all segments and may not be noted with a corresponding map number.

Any of these resources may be considered Section 4(f) resources for evaluation in subsequent Tier 2 studies. Refer to Section 3.19, *Section 4(f) and Section 6(f) Resources,* for further discussion.

Figure 3.5-1. Parks and trails, Segments 1 and 2

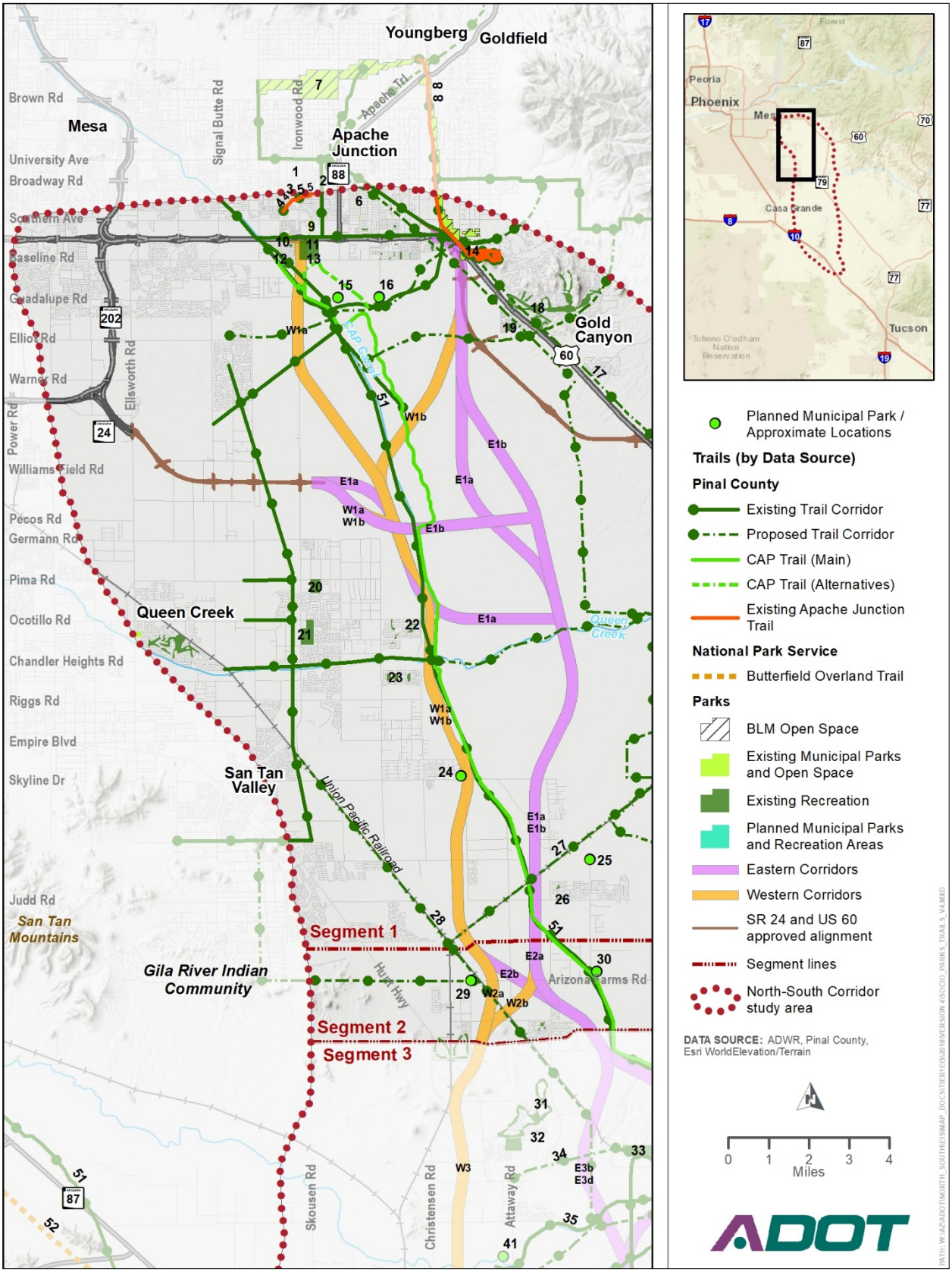


Figure 3.5-2. Parks and trails, Segments 3 and 4

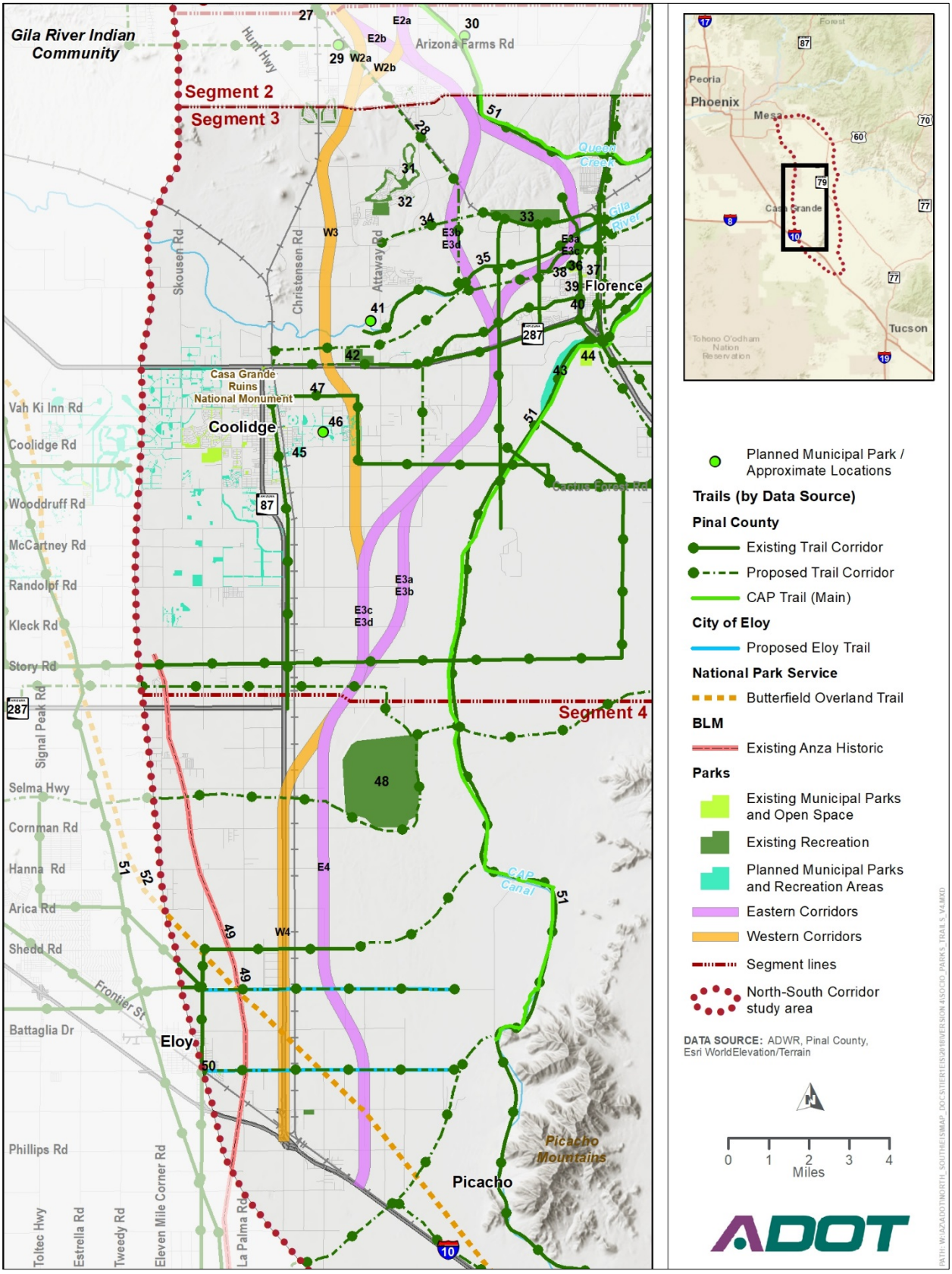


Table 3.5-1. Park and trails map identification guide

Map no.	Facility name	Segment	Status
1	Little League Park	1	Existing
2	Phelps Drive Open Space	1	Existing
3	Ironwood Cove Retention Basin Open Space	1	Existing
4	Renaissance Point Trail and Open Space	1	Existing
5	Arroyo Verde Trail and Open Space	1	Existing
6	Royal Palm Road Open Space	1	Existing
7	Sheep Drive Multiuse Trail	1	Existing
8	Goldfield to Florence Historic Trail	1	Existing
9	Superstition Shadows Park	1	Existing
10	Palmas del Sol East Neighborhood Parks	1	Existing
11	Apache Creek Golf Course	1	Existing
12	La Casa Blanca Neighborhood Parks	1	Existing
13	Desert Harbor Neighborhood Parks	1	Existing
14	Silly Mountain Park and Trails	1	Existing/Planned
15	Apache Junction Community Parks	1	Planned
16	Apache Junction Community Parks	1	Planned
17	Crest Trail	1	Planned
18	Mountain Brook Golf Club	1	Existing
19	Gold Canyon RV & Golf Resort	1	Existing
20	Apache Sun Golf Club	1	Existing
21	Links at Queen Creek	1	Existing
22	Castlegate Neighborhood Parks	1	Existing
23	Laredo Ranch Neighborhood Parks	1	Existing
24	Florence Community Park #8	1	Planned
25	Florence Magma Dam Basin Community Park and Open Space	1	Planned
26	Magma Ranch Neighborhood Parks	1	Existing
27	Magma Arizona Railroad Trail	1, 2	Planned
28	Copper Basin Railroad Trail	1, 2, 3	Planned
None	City of Apache Junction, Proposed Future Trail Link	1	Planned
29	Florence Dobson Farms Community Park	2	Planned
30	Florence Skyview Farms Community Park	2	Planned
31	Poston Butte Golf Club	3	Existing
32	Anthem at Merrill Ranch Neighborhood Parks	3	Existing

Table 3.5-1. Park and trails map identification guide

Map no.	Facility name	Segment	Status
33	Poston Butte Trail and Open Space	3	Existing
34	Florence Power Line Corridor Trail	3	Planned
35	Gila River Trail	3	Existing
36	Heritage Park/McFarland State Historic Park	3	Existing
37	Little League Park/Dorothy Noland Senior Center	3	Existing
38	Jacques Square	3	Existing
39	Arriola Square	3	Existing
40	Main Street Park	3	Existing
41	Florence Gila River North Side Community Park	3	Planned
42	Hohokam Country Club (approximate)	3	Existing
43	Florence Municipal Park, Proposed Between Canals Open Space	3	Planned
44	Florence Memorial Park (Cemetery)	3	Existing
45	Kenilworth Sports Complex	3	Existing
46	Coolidge Parks	3	Planned
47	Pima Lateral Canal Trail	3	Existing
48	Picacho Reservoir	4	Existing
49	Anza Historic Trail	4	Existing
50	Jones Park	4	Existing
51	Florence/Casa Grande Canal Corridors	1, 2, 3, 4	Existing
52	National Park Service, Butterfield Overland Trail	4	Planned
None	Pinal County, Other Proposed Multiuse Trail Corridors	1, 3, 4	Planned
None	City of Eloy, Proposed Trail	4	Planned

3.5.4 Environmental Consequences

The following sections discuss the potential impacts of the No-Action Alternative and action corridor alternatives. With implementation of the proposed action, the anticipated parks and recreational facilities impacts would be (1) direct, where recreational land is permanently incorporated into the transportation facility or is no longer available for recreational activities, or (2) indirect, where adjacent recreational land uses are altered by the presence of the new transportation facility, such as increased noise or diminished aesthetic character and quality.

3.5.4.1 No-Action Alternative

With the No-Action Alternative, the parks and recreational facilities summarized above would continue to be used by and/or built to serve the growing communities in the study area, and no recreational land would be incorporated into a transportation facility. The proposed action would not be implemented;

therefore, any improvements to access and connectivity to the parks and recreational facilities provided by the proposed action would not be available to study area residents.

3.5.4.2 Action Corridor Alternatives

Direct impacts would occur if all or a portion of the park or recreational facility were permanently incorporated into the proposed transportation facility. Direct impacts may also occur if access to the facility or the intended use of the facility were altered in some way. However, depending on the specific characteristics of the park or recreational facility, such as proximity to the action corridor alternative and sensitivity of the use, impacts could also be indirect if construction or operation of the proposed action would affect the park and/or recreational facility user experience, such as by construction-generated noise and dust or by operational noise and aesthetic impacts.

As shown on Figures 3.5-1 and 3.5-2, all of the action corridor alternatives could potentially directly or indirectly affect existing and planned parks and recreational facilities. Based on the extensive presence of parks and recreational facilities throughout the study area, it is unlikely that all of these resources within the 1,500-foot-wide corridors would be entirely avoided with a Tier 2 alignment. Although the exact number and acreage of parks and/or recreational facilities that would be affected by implementation of the proposed action would vary (depending on the alignment developed during Tier 2 studies), impacts would generally be direct conversion of parks or recreational facilities to a nonrecreational use.

Indirect construction impacts on parks or recreational facilities would also occur if the resource were located near or within the construction area. Impacts of this type might include increases in dust from ground disturbance, noise from construction equipment, views of construction activities, access restrictions, and the presence of construction staging areas. These impacts would be short-term and temporary because they would occur during construction or until ground disturbance activities were completed. Construction impacts would be more likely around urban and more densely populated areas where parks or recreational resources are concentrated. Permanent indirect impacts on parks or recreational facilities may occur if operational aspects of the transportation facility affect the recreational features or value of the park or recreational facility. Indirect operational impacts on parks or recreational facilities could consist of permanent changes in access to the resource, increased noise, and changes to the visual character or quality as a result of the presence of the new transportation facility. The parks or recreational resources within 0.5 mile of the action corridor alternatives, and which have the potential to be directly or indirectly affected, are shown in Table 3.5-2. The action corridor alternatives with the potential to directly affect the most recreational resources are: for Segment 1, the W1a or W1b Alternatives; for Segment 2, the W2a or W2b Alternatives; for Segment 3, the E3b, E3d, or W3 Alternatives; and for Segment 4, the E4 or W4 Alternatives. Additional details for these potential direct impacts are described below.

- In Segment 1, the E1a, E1b, and W1b Alternatives may directly affect the planned portion of Silly Mountain Park and Trails, an existing public recreation facility on the northeastern side of US 60 with plans for expansion within the 1,500-foot-wide corridors. However, the actual impacts of a Tier 2 alignment may avoid impacts on the planned portions of the park, and the City of Apache Junction has indicated that it would be open to consultation during Tier 2 studies for the project. Moreover, planning documents for the park identify a future transportation facility through Silly Mountain Park. The W1a Alternative would directly affect the Apache Creek Golf Course, an existing private recreational facility. Avoiding this direct impact during Tier 2 studies would require shifting the alignment farther west, encroaching further into residential development and potentially affecting the Palmas Del Sol East Neighborhood Parks. It is likely that the W1a Alternative system traffic interchange with US 60 that would be developed in the Tier 2 phase could be designed to avoid direct impacts on recreational facilities associated with Apache Junction High School, immediately north of US 60. The W1a and W1b Alternatives would potentially affect the Florence Community Park #8, a

planned public recreational facility. All other potential impacts in Segment 1 would be related to existing or planned trails, where such impacts may be avoided through local agency coordination and/or design modifications to avoid or minimize impacts. These measures would be determined during the subsequent Tier 2 analysis.

- In Segment 2, all potential direct impacts are related to existing or planned trails, where such direct impacts may be avoided through local agency coordination and/or design modifications to avoid or minimize impacts. These measures would be determined during the subsequent Tier 2 analysis.
- In Segment 3, the W3 Alternative would potentially directly affect the Coolidge Parks, which are planned recreation facilities. All other potential direct impacts in Segment 3 are related to existing or planned trails, where such direct impacts may be avoided through local agency coordination and/or design modifications to avoid or minimize impacts. These measures would be determined during the subsequent Tier 2 analysis.
- In Segment 4, all potential direct impacts are related to existing or planned trails, where such direct impacts may be avoided through local agency coordination and/or design modifications to avoid or minimize impacts. These measures would be determined during the subsequent Tier 2 analysis.

Table 3.5-2. Parks and recreation facilities within 0.5 mile of action corridor alternatives

Action corridor alternative	Parks and recreation facilities within 0.5 mile	Potential impact
Segment 1		
E1a	Sheep Drive Multiuse Trail	Direct
	Silly Mountain Park and Trails	Direct
	Magma Ranch Neighborhood Parks	Indirect
	Goldfield to Florence Historic Trail	Indirect
	Crest Trail (planned)	Indirect
	Magma Arizona Railroad Trail (planned)	Direct
	Florence/Casa Grande Canal Corridors	Direct
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct
E1b	Sheep Drive Multiuse Trail	Direct
	Silly Mountain Park and Trails	Direct
	Magma Ranch Neighborhood Parks	Indirect
	Goldfield to Florence Historic Trail	Indirect
	Crest Trail (planned)	Indirect
	Magma Arizona Railroad Trail (planned)	Direct
	Florence/Casa Grande Canal Corridors	Direct
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct

Table 3.5-2. Parks and recreation facilities within 0.5 mile of action corridor alternatives

Action corridor alternative	Parks and recreation facilities within 0.5 mile	Potential impact
W1a	Superstition Shadows Park	Indirect
	Palmas Del Sol East Neighborhood Parks	Indirect
	Apache Creek Golf Course	Direct
	La Casa Blanca Neighborhood Parks	Indirect
	Desert Harbor Neighborhood Parks	Indirect
	Castlegate Neighborhood Parks	Indirect
	Laredo Ranch Neighborhood Parks	Indirect
	Florence Community Park #8 (planned)	Direct
	Magma Arizona Railroad Trail (planned)	Direct
	Copper Basin Railroad Trail (planned)	Indirect
	Florence/Casa Grande Canal Corridors	Direct
	Pinal County Other Existing Multi-Use Trail Corridors	Direct
W1b	Sheep Drive Multiuse Trail	Direct
	Silly Mountain Park and Trails	Direct
	Castlegate Neighborhood Parks	Indirect
	Laredo Ranch Neighborhood Parks	Indirect
	Florence Community Park #8 (planned)	Direct
	Goldfield to Florence Historic Trail	Indirect
	Crest Trail (planned)	Indirect
	Magma Arizona Railroad Trail (planned)	Direct
	Copper Basin Railroad Trail (planned)	Indirect
	Florence/Casa Grande Canal Corridors	Direct
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct
Segment 2		
E2a	Florence/Casa Grande Canal Corridors	Indirect
E2b	Magma Arizona Railroad Trail (planned)	Indirect
	Copper Basin Railroad Trail (planned)	Indirect
	Florence/Casa Grande Canal Corridors	Indirect
W2a	Florence Dobson Farms Community Park (planned)	Indirect
	Magma Arizona Railroad Trail (planned)	Indirect
	Copper Basin Railroad Trail (planned)	Direct
W2b	Copper Basin Railroad Trail (planned)	Direct
	Florence/Casa Grande Canal Corridors	Indirect

Table 3.5-2. Parks and recreation facilities within 0.5 mile of action corridor alternatives

Action corridor alternative	Parks and recreation facilities within 0.5 mile	Potential impact
Segment 3		
E3a	Poston Butte Trail and Open Space	Indirect
	Heritage Park/McFarland State Historic Park	Indirect
	Gila River Trail	Direct
	Florence/Casa Grande Canal Corridors	Indirect
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct
E3b	Copper Basin Railroad Trail (planned)	Direct
	Florence Power Line Corridor Trail	Direct
	Gila River Trail	Direct
	Florence/Casa Grande Canal Corridors	Indirect
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct
E3c	Poston Butte Trail and Open Space	Indirect
	Heritage Park/McFarland State Historic Park	Indirect
	Gila River Trail	Direct
	Florence/Casa Grande Canal Corridors	Indirect
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct
E3d	Copper Basin Railroad Trail (planned)	Direct
	Florence Power Line Corridor Trail (planned)	Direct
	Gila River Trail	Direct
	Florence/Casa Grande Canal Corridors	Indirect
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct
W3	Hohokam Country Club	Indirect
	Pima Lateral Canal Trail	Direct
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct
	Coolidge Parks (planned)	Direct
Segment 4		
E4	Butterfield Overland Trail (planned)	Direct
	Picacho Reservoir	Indirect
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct
W4	Butterfield Overland Trail (planned)	Direct
	Pinal County Other Existing and Proposed Multi-Use Trail Corridors	Direct

3.5.5 Potential Avoidance, Minimization, and Mitigation Strategies

During the Tier 2 design for the proposed action, ADOT would avoid impacts on parks and recreational facilities to the extent possible. ADOT would coordinate with the local jurisdictions regarding the affected parks and/or recreational facilities to maintain access to the resources potentially affected to the extent feasible. Where access cannot be maintained or where implementation of the proposed action would require full or partial acquisition of existing parks or recreational facilities, potential mitigation measures would be developed in consultation with the local agencies. Specific mitigation measures may include minimizing the acreage of acquisition of these areas during the Tier 2 design, selecting alternatives that avoid parks and recreational facilities, strategically locating construction equipment to suitable locations within existing parks and recreational facilities, and designing landscaping to offset vegetation removal or to establish screening for noise and visual disturbances.

Appendix D, *Summary of Avoidance, Minimization, and Mitigation Strategies*, contains a consolidated list of strategies to address environmental impacts.

3.5.6 Subsequent Tier 2 Analysis

Parkland and recreational facilities would require consideration in the Tier 2 phase and in final design, should an action corridor alternative become the preferred alternative. Subsequent analysis related to parkland and recreational resources for the Tier 2 analysis should involve a detailed description of existing and planned parks and recreational facilities that are within 0.5 mile of the study area, along with their distance from the preferred alternative.

As Tier 2 alignments within the selected corridor are developed, all efforts would be made during preliminary design to avoid impacts of any type on parks or recreational facilities.

3.5.6.1 Conclusion

As shown on Figures 3.5-1 and 3.5-2, existing and planned parks and recreational facilities are located adjacent to or intersect the action corridor alternatives in all segments. Therefore, all action corridor alternatives would affect these resources. The action corridor alternatives with the potential to directly affect the most recreational resources are: for Segment 1, the W1a or W1b Alternatives; for Segment 2, the W2a or W2b Alternatives; for Segment 3, the E3b, E3d, or W3 Alternatives; and for Segment 4, the E4 or W4 Alternatives.

In Segment 1, the E1a, E1b, and W1b Alternatives may directly affect the planned portion of Silly Mountain Park and Trails; however, the actual impacts of a Tier 2 alignment may avoid impacts on the park since planning documents for the park identify a future transportation facility through the park. The W1a Alternative would directly affect the existing Apache Creek Golf Course, a private facility, and the recreational facilities associated with Apache Junction High School. Also in Segment 1, the W1a and W1b Alternatives may directly affect the planned Florence Community Park #8. In Segment 3, the W3 Alternative may directly affect the planned Coolidge Parks. All other potential direct impacts are related to existing or planned trails, where such direct impacts may be avoided or minimized through local agency coordination and/or design modifications during subsequent Tier 2 analysis.

3.6 Prime and Unique Farmland

This section provides an overview of the study area's prime and unique farmland setting and preliminary information concerning prime and unique farmlands in the action corridor alternatives.

3.6.1 Regulatory Context

Land in the study area could be subject to regulation under the Farmland Protection Policy Act (FPPA) (7 CFR Part 658).

The FPPA was established in 1981 and is administered by the Natural Resources Conservation Service (NRCS) (2016a). According to NRCS, the purpose of the FPPA is to:

1. Minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.
2. Encourage alternative actions, if appropriate, that could lessen the adverse effects on farmland; and
3. Ensure that federal programs are operated in a manner that, to the extent practicable, will be compatible with state, local government, and private programs that protect farmland.

According to NRCS, under the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. However, farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but water or urban built-up land is not included. NRCS defines prime and unique farmland as:

- Prime farmland – Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods of time, and is either not flooded frequently or is protected from flooding.

  Prime farmland soils are further defined by the following qualifiers:

  - prime farmland if irrigated
  - prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

- Unique farmland – Land other than prime farmland that is used for production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high-quality or high yields of specific crops.

3.6.2 Methodology

The evaluation presented in this section was based on available information on prime and unique farmland in the study area, which was identified using NRCS data (2016b). NRCS soil surveys were used to identify the soil types that are best able to support cultivation and farming of common crops, when irrigated, in the study area. Further, indicators of prime farmland (such as water supply, lack of flooding, growing season length) were applied and prime farmland areas located. Areas able to support high-value

food and fiber crops were identified as unique farmland. The acreages of these areas were tabulated and then analyzed as a percentage of the total study area.

3.6.3 Affected Environment

To accurately depict the farmland setting of the study area, descriptions of existing and planned agricultural land uses and characteristics in the study area jurisdictions were reviewed and are summarized below.

- Pinal County – According to the *Pinal County Comprehensive Plan*, the County has had, and continues to experience, rapid growth. The County has seen a reduction in agricultural activities because of increasing costs, federal regulations, development encroachment, and the changing global market. At the same time, Native American communities in the County are increasing the number of acres in agricultural production (Pinal County 2015). The Gila River Indian Community has major agricultural operations.

  Historically, farming has been a valued part of the County's heritage, with thousands of acres still in agricultural production. However, the County is experiencing a transition away from agricultural production as farmland is sold for residential development. The *Comprehensive Plan* indicates that agricultural land uses will be supported as long as they are economically feasible.

- Mesa – According to the *Mesa 2040 General Plan*, several small pockets of agricultural land are scattered throughout the city's urbanized areas, with larger concentrations around the Lehi area, Falcon Field Airport, and Phoenix-Mesa Gateway Airport (City of Mesa 2014).

- Queen Creek – According to the Queen Creek *North Specific Area Plan*, the town was originally developed as a rural residential and agricultural community. It prioritizes the preservation of its unique agricultural and rural character while planning for the use of the remaining agricultural land and managing growth (Town of Queen Creek 2016).

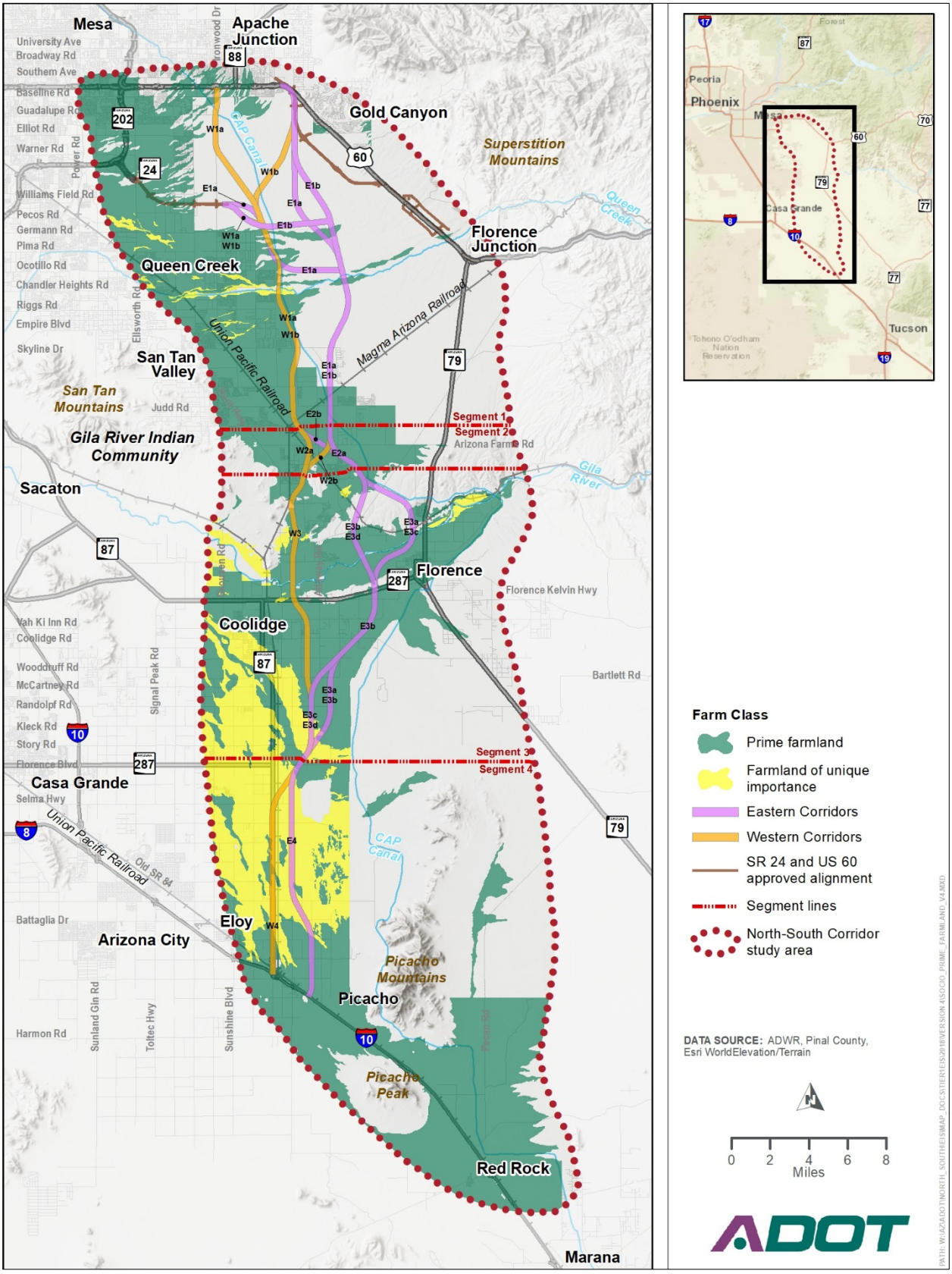
- Florence – According to the *Town of Florence 2020 General Plan*, the town has historically been an agricultural community because of good soils and the presence of the Gila River (Town of Florence 2008a). The planning area encompasses 196 square miles, of which about 10 percent is currently developed. The remainder is undeveloped or in agricultural production. The Town of Florence predicts that the agricultural and natural areas north of the Gila River will experience the most development in the planning area, as agricultural land transitions into master-planned communities and employment centers to accommodate future growth.

- Coolidge – According to the City of Coolidge *2025 General Plan*, the city continues to be a major agricultural center (City of Coolidge 2014). The *General Plan* recognizes the importance of agriculture in the planning area, and agricultural land uses account for more than 10 percent of the area.

- Eloy – According to the City of Eloy *2010 General Plan Update*, the city is located in the Santa Cruz Basin, which is one of Arizona's most fertile soil and agricultural areas (City of Eloy 2011). Historically, the city's economy has largely depended on agriculture; however, more recently, the economy has diversified to encompass industrial, wholesale/retail trade, and service sectors. Although most land is designated for residential purposes, the predominant current land use is agriculture.

As noted previously, prime and unique farmland in the study area was identified using NRCS data. The amount of prime and unique farmland varies by action corridor alternative, but generally encompasses large portions of the study area, as shown on Figure 3.6-1. Prime and unique farmland is present in all the study area segments, but predominantly in the southern segments of the study area (Segments 2, 3, and 4).

Figure 3.6-1. Prime and unique farmland



3.6.4 Environmental Consequences

With implementation of the proposed action, the anticipated farmland impacts would be (1) direct, where land is taken out of agricultural production or is no longer farmable or (2) indirect, where adjacent land is taken out of agricultural production. Farmland impacts could also be cumulative, where agricultural land is bisected, resulting in isolated parcels that can no longer be economically or feasibly farmed.

3.6.4.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not be built and would not convert farmland to a transportation use. However, planned land development in the future would convert farmland to other uses. Land use plans prepared by study area jurisdictions identify how, where, and to what extent individual jurisdictions envision future build-out and the relationship between the natural and built environments. County and municipal plans, which describe existing and future land use patterns based on projected population and employment growth, and transportation needs as they relate to the proposed action, are discussed in Section 3.2, *Land Use*. As discussed in Section 3.2, given the study area's central location between Phoenix and Tucson and within the Sun Corridor, new development by 2040 is anticipated to be substantial even without the proposed action, and is expected to convert farmland to nonagricultural uses.

3.6.4.2 Action Corridor Alternatives

As shown in Figure 3.6-1, all the action corridor alternatives contain prime and unique farmland. Based on the extensive presence of prime and unique farmland throughout the study area, farmland could not be entirely avoided. Although the exact acreage of prime and unique farmland that would be affected by implementation of the proposed action would vary based on the selection of a preferred alternative, impacts would generally be direct conversion of prime and unique farmland to a nonagricultural use.

Acreages of prime and unique farmland potentially affected by the action corridor alternatives are shown in Table 3.6-1, which also shows the percentage of land under each action corridor alternative that is considered prime and unique farmland. Acreages were determined by overlaying the alternatives on the existing prime and unique farmlands in the study area. Table 3.6-1 shows that the action corridor alternatives with the potential to directly affect the most prime and unique farmland are: in Segment 1, the W1a Alternative; in Segment 2, the E2b Alternative; in Segment 3, the E3c Alternative; and in Segment 4, the E4 Alternative. In the case of Segment 1, the next closest alternative in impact (W1b Alternative) is only 4 acres less than the W1a Alternative, so they are very similar in impact. In Segment 2, the difference between the top two is a tenth of a percent, so they are almost identical. In Segment 4, the difference is less than one-half percent between the two. Depending on the Tier 2 alignments, impacts would vary from what is reported in Table 3.6-1.

Depending on parcel characteristics such as size and ownership, impacts could also be indirect or cumulative if, during the ROW acquisition process, it is determined that certain farmland areas could become too small or fragmented to economically or feasibly continue farming activities.

Table 3.6-1. Prime and unique farmland resources, by action corridor alternative

Action corridor alternative	Acres of prime and unique farmland	Percentage of total corridor that is prime and unique farmland (%)
Segment 1		
E1a	2,660	17.86
E1b	1,887	13.88
W1a	5,164	43.96
W1b	4,623	39.79
Segment 2		
E2a	1,809	99.50
E2b	2,274	99.60
W2a	1,627	95.56
W2b	1,849	94.93
Segment 3		
E3a	8,528	82.11
E3b	8,026	86.00
E3c	8,587	82.21
E3d	8,085	86.09
W3	8,185	95.75
Segment 4		
E4	7,063	99.37
W4	6,463	98.98

Source: Natural Resources Conservation Service (2016b)

3.6.5 Potential Avoidance, Minimization, and Mitigation Strategies

During the Tier 2 design, ADOT would coordinate with affected property owners to maintain access to farmland to the extent feasible. Where access cannot be maintained, or where property acquisition is required, acquisition would be undertaken in accordance with the Uniform Act (49 CFR Part 24).

Additional mitigation measures may be implemented following consultation with NRCS during Tier 2 analysis.

Appendix D, *Summary of Avoidance, Minimization, and Mitigation Strategies*, contains a consolidated list of strategies to address environmental impacts.

3.6.6 Subsequent Tier 2 Analysis

The presence of prime and unique farmlands would not preclude construction of the proposed action within any of the proposed action corridor alternatives. However, as described below, prime and unique farmlands within the action corridor alternatives would require further consideration in the Tier 2 phase and in final design, should an action corridor alternative become the preferred alternative.

During subsequent Tier 2 analysis, the acreage of prime and unique farmland by action corridor alternative that would be directly converted to nonagricultural uses should be calculated, and a comparative analysis should be prepared to determine which action corridor alternatives would have the greatest or least potential for direct conversion of prime and unique farmland to nonagricultural use.

The Farmland Conservation Impact Rating process is used to determine the impact of a proposed action on land regulated by the FPPA. Under the FPPA, the Land Evaluation and Site Assessment scoring system is used to measure the quality of farmland based on land evaluation and corridor assessment criteria (NRCS 2016c), the results of which are documented on the NRCS-CPA-106 form, “Farmland Conversion Impact Rating for Corridor Type Projects.”

This form is typically completed by both the proposed action sponsor agency and NRCS. Information about the acreage of prime and unique farmland that would be converted to nonagricultural uses is entered into Part III of the NRCS-CPA-106 form. The land evaluation criterion outlined on Part V of the form is used to assign a score of between 0 and 100 to groups of soil types based on their productivity and capability to support crops. In Part VI, the corridor assessment criteria are used to assign a score of between 0 and 160 to farmland in the study area based on the suitability of each action corridor alternative for protecting farmland (7 CFR § 658.5). Land that receives a combined score of 160 points or greater is typically given increased levels of consideration for protection under the FPPA (7 CFR § 658.4). When making decisions on proposed actions for sites receiving scores totaling 160 or more, NRCS considers use of land that is not farmland or use of existing structures; alternative sites, locations, and designs that would serve the proposed purpose but convert either fewer acres of farmland or other farmland that has a lower relative value; and special siting requirements of the proposed project and the extent to which an alternative site fails to satisfy the special siting requirements as well as the originally selected site. Land receiving a score of less than 160 points is not typically given further consideration for protection.

During Tier 2 analysis, ADOT, in conjunction with NRCS, would determine the Land Evaluation and Site Assessment score for the alignments by completing the NRCS-CPA-106 form. Where the score is determined to be 160 points or greater, ADOT would consult with NRCS for alternatives to avoid farmland impacts where feasible. Following this consultation, ADOT would consider the NRCS recommendations for minimizing the adverse effects and alternative actions to lessen the conversion’s adverse effects on protected farmland. Where farmland impacts are determined to be unavoidable, measures to minimize or reduce the impacts would be evaluated and implemented to the extent possible. Finally, ADOT would report the possible alternative actions and the final project decision to NRCS.

3.6.6.1 Conclusion

All action corridor alternatives would affect prime and unique farmland, with the acreage impacts generally increasing from north to south through the study area. The action corridor alternatives with the greatest potential to directly affect prime and unique farmland are: in Segment 1, the W1a Alternative; in Segment 2, the E2b Alternative; in Segment 3, the E3c Alternative; and in Segment 4, the E4 Alternative.

3.7 Air Quality

This section provides an overview of the study area's air quality setting and information regarding potential air quality impacts of the action corridor alternatives.

3.7.1 Regulatory Context

3.7.1.1 National Ambient Air Quality Standards

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. These standards include both primary and secondary standards. Primary standards protect public health, while secondary standards protect public welfare (such as protecting property and vegetation from the effects of air pollution).

These national standards have been adopted by the State of Arizona as the ambient air quality standards in the state and are shown in Table 3.7-1. If an area meets the NAAQS for a given air pollutant, the area is called an *attainment area* for that pollutant (because the NAAQS have been attained). If an area does not meet the NAAQS for a given air pollutant, the area is called a *nonattainment area*. A *maintenance area* is an area previously designated as a nonattainment area but is currently attaining the standard. A maintenance plan outlining steps for continued attainment over the maintenance period is required for all maintenance areas.

Maricopa County is currently designated as a nonattainment area for the 8-hour ozone (O_3) and particulate matter with a diameter of ten microns or less (PM_{10}) NAAQS and as a maintenance area for carbon monoxide (CO). A portion of Pinal County is designated as a nonattainment area for PM_{10}.

Ozone

O_3 is the primary component of photochemical smog. It occurs naturally in the stratosphere and reduces the amount of ultraviolet radiation reaching the earth's surface. O_3 is not emitted directly into the air but is formed by nitrogen oxides and volatile organic compounds that react in the presence of heat and sunlight to form O_3. Ground-level O_3 forms readily in the atmosphere, usually during hot weather, and can affect people's respiratory systems and plant growth.

Nitrogen oxides are emitted from motor vehicles, power plants, and other combustion sources. Volatile organic compounds are emitted from a variety of sources including motor vehicles, chemical plants, refineries, factories, and other industrial sources.

Particulate Matter

Particulate matter (PM) includes both solid particles and liquid droplets in the air. Many anthropogenic (human-caused) and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. PM can be inhaled and accumulate in the respiratory system. Sources of PM include crushing or grinding operations and dust from paved or unpaved roads. Fugitive dust is PM suspended in the air primarily from soil that has been disturbed by wind or other activities.

Carbon Monoxide

CO, which is emitted by engines, is a colorless, odorless, poisonous gas that reduces the amount of oxygen carried in the bloodstream by forming carboxy-hemoglobin, which prevents oxygenation of the blood. CO is emitted directly into the atmosphere from automobiles. Other sources of CO emissions include industrial processes such as non-transportation fuel combustion and natural sources such as wildfires.

Table 3.7-1. National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Averaging time	Level	Form
Carbon monoxide (CO)	Primary	8-hour average	9 ppm	Not to be exceeded more than once per year
		1-hour average	35 ppm	
Lead (Pb)	Primary and secondary	Rolling 3-month average	0.15 µg/m^{3}[a]	Not to be exceeded
Nitrogen dioxide (NO_2)	Primary	1-hour average	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary and secondary	Annual average	53 ppb[b]	Annual mean
Ozone (O_3)	Primary and secondary	8-hour average	0.070 ppm[c]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particulate matter ($PM_{2.5}$)	Primary	Annual average	12 µg/m^3	Annual mean, averaged over 3 years
	Secondary	Annual average	15 µg/m^3	Annual mean, averaged over 3 years
	Primary and secondary	24-hour average	35 µg/m^3	98th percentile, averaged over 3 years
Particulate matter (PM_{10})	Primary and secondary	24-hour average	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur dioxide (SO_2)	Primary	1-hour average	75 ppb[d]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour average	0.5 ppm	Not to be exceeded more than once per year

Source: https://www.epa.gov/criteria-air-pollutants/naaqs-table

Notes: PM_{10} = particulate matter 10 microns in diameter or less, $PM_{2.5}$ = particulate matter 2.5 microns in diameter or less, ppb = parts per billion, ppm = parts per million, µg/m^3 = micrograms per cubic meter

[a] Final rule signed October 15, 2008. The 1978 lead standard (0.15 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[b] The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

[c] Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

[d] Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

High concentrations of CO generally occur along roadways and near intersections with congested traffic. Calm winds during the late fall and winter, combined with nighttime and early morning temperature inversions, can cause a buildup of CO in urban areas.

3.7.1.2 Mobile Source Air Toxics

In addition to the NAAQS, EPA has developed a list of 21 mobile source air toxics (MSATs) that result from industrial activities and motor vehicle emissions. Research has shown that people exposed to MSATs at sufficiently high concentrations or for extended periods of time may have an increased risk of certain health effects, including cancer, compromised immune systems, or neurological problems.

To date, no federal standards have been adopted for MSAT emissions.

3.7.1.3 Greenhouse Gases

Climate change is an important national and global concern, and there is general agreement that the earth's climate is changing at an accelerated rate and will continue to do so for the foreseeable future. Human-caused greenhouse gas (GHG) emissions contribute to this rapid change, with carbon dioxide being the largest component of GHG emissions. The transportation sector is the largest source of total GHGs in the United States and the largest source of carbon dioxide emissions, the predominant GHG. In 2016, the transportation sector was responsible for 27 percent of all carbon dioxide emissions produced in the United States (EPA 2018a).

To date, no national standards have been established for GHGs. Because climate change is a global issue and the emission changes attributable to the proposed action would be very small compared with global totals, in this study, GHG emissions were not estimated for the action corridor alternatives or the No-Action Alternative. Instead, the discussion focuses on VMT for the action corridor alternatives and how the differences between the alternatives are likely to affect GHG emissions, both locally and globally.

As part of ADOT's Resilience Program, and in conjunction with FHWA's Extreme Weather and Climate Resilience Pilot Program, a study was conducted to assess the vulnerability of ADOT-managed transportation infrastructure to Arizona-specific extreme weather and measurable future climate trends. In the long term, ADOT seeks to develop a multistakeholder decision-making framework—including planning, asset management, design, construction, maintenance, and operations—to cost-effectively enhance the resilience of Arizona's transportation system to extreme weather and climate risk.

For the study, ADOT focused on the Interstate corridors connecting Nogales, Tucson, Phoenix, and Flagstaff (Interstate 19, I-10, and Interstate 17). This corridor includes a variety of urban areas, landscapes, biotic communities, and climate zones, which present a range of weather conditions applicable to much of Arizona. The study team examined climate-related stressors including extreme heat, freeze-thaw, extreme precipitation, and wildfire, considering the potential change in these risk factors as the century progresses.

The study leveraged a vulnerability assessment framework, customizing it to fit the study's needs. The study team gathered information on potential extreme weather and climate impacts and collected datasets for transportation facilities and land cover characteristics (for example, watersheds, vegetation), and integrated these datasets to perform a high-level assessment of potential infrastructure vulnerabilities. Each step of the process drew heavily on internal and external stakeholder input and feedback. The assessment qualitatively addressed the complex, often uncertain interactions between climate and extreme weather, land cover types, and transportation facilities—with an ultimate focus on potential risks to infrastructure. The study results will help ADOT integrate climate-resilient features into future projects.

3.7.1.4 Transportation Conformity Requirements

All state governments are required to develop a State Implementation Plan (SIP) that explains how the State will comply with requirements of the federal Clean Air Act of 1990, as amended. The Clean Air Act requires that transportation plans, programs, and projects that are developed, funded, or approved by FHWA must demonstrate that such activities conform to the SIP. Transportation conformity requirements apply to any transportation-related criteria pollutants (for example, CO or PM) for which the project area has been designated a nonattainment or maintenance area.

Under Section 176(c) of the Clean Air Act, a transportation project is said to "conform" to the provisions and purposes of the SIP if the project, both alone and in combination with other planned projects, does not:

- Cause or contribute to new air quality violations of the NAAQS,

- Worsen existing violations of the NAAQS, or
- Delay timely attainment of the NAAQS or required interim milestones.

The transportation conformity rule (40 CFR Part 93, Subpart A) establishes the criteria and procedures for determining whether projects conform to the SIP (EPA 2012).

3.7.2 Methodology

This evaluation was based on available information at this stage of development, including regional nonattainment area data and existing environmental conditions. Additionally, VMT and LOS information from the *Traffic Report, North-South Corridor Study* (Appendix B, *Traffic Information*) were studied to determine whether one or more of the alternatives would result in substantially greater vehicle emissions than the others.

3.7.3 Affected Environment

Table 3.7-2 shows the air quality attainment status for motor vehicle-related pollutants in Maricopa and Pinal Counties for the study area. For each area, the table also shows the years of nonattainment or the date the area was redesignated to maintenance.

As shown in the table, Maricopa County is classified as a nonattainment area for PM_{10} and O_3 and a maintenance area for CO. Pinal County is a nonattainment area for PM_{10}. The major sources of PM_{10} throughout the study area include wind-blown dust and particulates from exposed soils and agricultural tilling practices and from vehicle traffic on unpaved roads. These emission sources account for 80 to 90 percent of PM_{10} emissions in Pinal County, while emissions associated with paved road sources account for less than 1 percent of the county's annual emissions (Arizona Department of Environmental Quality [ADEQ] 2013). Relative to other sources of PM_{10} in the study area, mobile source emissions are not substantial emission sources.

Table 3.7-2. Areas with nonattainment and maintenance status in the study area[a]

Nonattainment area	Pollutant	Status	Classification
Maricopa County, Phoenix	1-hour ozone	Maintenance (redesignation on June 14, 2005)	Serious
Maricopa County, Phoenix/Mesa	8-hour ozone	Nonattainment (2012 through 2018)	Moderate
Maricopa County, Phoenix	Carbon monoxide	Maintenance (redesignation on April 8, 2005)	Serious
Maricopa County, Phoenix	PM_{10}	Nonattainment (1992 through 2018)	Serious
Pinal County, Phoenix/Mesa	8-hour ozone	Nonattainment (2012 through 2018)	Moderate
Pinal County, Phoenix	PM_{10}	Nonattainment (1992 through 2018)	Serious
Pinal County, West Pinal	PM_{10}	Nonattainment (2012 through 2018)	Moderate

Source: U.S. Environmental Protection Agency (2018b)

Note: PM_{10} = particulate matter 10 microns in diameter or less

[a] Appendix F, *Air Quality Information*, contains maps from the Arizona Department of Environmental Quality showing areas of PM_{10} nonattainment, ozone nonattainment, and carbon monoxide maintenance (2018) that overlap the study area.

ADEQ maintains a network of air quality monitoring stations throughout the state. In general, these monitoring stations are in areas with known air quality problems, so they are usually in or near urban areas or close to specific emission sources. Other stations are in suburban locations or remote areas to provide an indication of regional pollutant levels.

Table 3.7-3 shows the monitoring results for PM_{10} from 2014 through 2017 at the monitoring stations in Maricopa and Pinal Counties that are closest to the action corridor alternatives.

Table 3.7-3. PM_{10} monitoring results for stations near the action corridor alternatives

Monitoring station (site ID)	Parameter (µg/m³)	2014	2015	2016	2017
Maricopa County					
Higley (04-013-4006)	Peak 24-hour value[a] Days above standard	137 0	137 0	137 0	113 0
Pinal County					
Apache Junction Fire Station (04-021-3002)	Peak 24-hour value Days above standard	131 0	131 0	131 0	86 0
Combs School (04-021-3009)	Peak 24-hour value Days above standard	80 0	80 0	80 0	143 0
Eloy County Complex (04-021-3014)	Peak 24-hour value Days above standard	137 0	137 0	137 0	51 0

Source: U.S Environmental Protection Agency (2017)
Notes: Exceptional events (that is, high winds) were excluded for all years.
µg/m³ = micrograms per cubic meter
[a] 24-hour PM_{10} standard = 150 µg/m³ (not to be exceeded more than once per year on average over 3 years)

The PM_{10} standard was exceeded in Pinal County at the Combs School station in 2015 and 2016 and at the Eloy County Complex station in 2016. Under certain conditions, such as high winds that result in large amounts of windblown dust, the 24-hour PM_{10} standard can be exceeded. These exceptional events are not included in Table 3.7-3.

3.7.4 Environmental Consequences

3.7.4.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not be constructed and there would be no freeway-related vehicle emissions. Emissions from other sources such as fugitive dust from agricultural tilling and wind-blown dust (the primary sources of particulates in Pinal County) would continue.

3.7.4.2 Action Corridor Alternatives

As discussed in Chapter 2, *Alternatives*, the action corridor alternatives evaluated in this Tier 1 DEIS include a Western Alternative, an Eastern Alternative, and combinations of both to avoid and minimize environmental impacts. In a few locations, two options are under consideration. In total, eight full-length action corridor alternatives are evaluated in this Tier 1 DEIS.

The traffic report prepared for the proposed action included an analysis of traffic performance, where performance measures were used to gauge the efficiency of the entire study area transportation network (see Appendix B, *Traffic Information*). The performance measures were VMT and VHT.

As summarized in the traffic report, an increase in overall study area VMT was measured with each alternative, compared with the 2040 No-Action Alternative. An increase in study area VMT indicated that travelers would be attracted to the proposed Corridor. Additionally, a decrease in total VHT is anticipated with each alternative, indicating that travelers would reach their desired destinations more quickly and efficiently.

The number of congested roads is also anticipated to decrease—by 6 to 17 percent as compared with the 2040 No-Action Alternative. Area-wide congestion is projected to decrease with implementation of the proposed action, benefiting the future study area transportation network.

Table 3.7-4 shows the daily VMT in the study area for alternative analyzed in the traffic report. As the table shows, the annual VMT would increase by 8 to 16 percent compared with the 2040 No-Action Alternative, depending on the alternative. The range of daily VMT is a function of the different options selected (for example, Alternative 2 includes the W1a and W1b options in Segment 1, and the E3a, E3b, E3c, and E3d options in Segment 3). From an air quality perspective, the difference in VMT between the action corridor alternatives is not considered to be substantial.

In addition to the VMT associated with each alternative, a second measure of performance is the LOS throughout the study area. In general, roadways operating with better LOS (that is, under free-flow conditions of LOS A, B, or C) generally have lower emissions than more congested roadways. For the proposed action, the projected LOS in 2040 is LOS C, or better, throughout the study area. Forecast ADT volumes vary throughout the study area, but range from a high of approximately 70,000 to a low of approximately 2,500, with traffic volumes generally decreasing from north to south.

Table 3.7-4. Area-wide traffic performance summary

Scenario	Total vehicle miles traveled (millions)	% change from No-Action Alternative
2015 existing conditions	5.00	—
2040 No-Action Alternative	12.63	—
Alternative 1	14.11–14.15	12
Alternative 2	13.66–14.60	8–16
Alternative 3	13.60–14.60	8–16
Alternative 4	14.09–14.14	12
Alternative 5	13.86–13.99	10–11
Alternative 6	13.65–14.69	8–16
Alternative 7	13.65–13.66	8
Alternative 8	14.14	12

Source: *Traffic Report, North-South Corridor Study* (see Appendix B)

Potential Impacts for Criteria Pollutants (Particulate Matter and Carbon Monoxide)

As noted previously, very little difference exists in the VMT associated with the action corridor alternatives. The proposed action would operate at an acceptable LOS (A, B, or C) in 2040. As a result, little difference would exist in the overall vehicle emissions among the action corridor alternatives.

The study area is in a nonattainment area for PM_{10} and is subject to transportation conformity requirements. Transportation conformity applies to projects funded or approved by FHWA in nonattainment and maintenance areas for transportation-related criteria pollutants. To meet the project-level conformity requirements, a project must come from a conforming metropolitan transportation plan and Transportation Improvement Program; its design concept and scope cannot be substantially different from what was modeled as part of the regional emissions analysis associated with the conformity determination for the metropolitan transportation plan and Transportation Improvement Program; it must

include hot-spot analyses in CO and PM areas; and it must demonstrate compliance with any control measures in a PM SIP.

The *Regional Transportation Plan* for Pinal County was approved in November 2017. However, the project has not been identified in the ADOT construction program, and no project activities have been included in the regional Transportation Improvement Program. As a result, transportation conformity cannot be determined at this time. In addition, no determination has been made regarding the proposed action's air quality status (that is, whether it is a project of air quality concern and warrants quantitative modeling to meet conformity requirements).

Nonetheless, potential air quality impacts can be qualitatively assessed by describing the types of projects that could be of air quality concern and potentially require quantitative analysis and by comparing the proposed action corridor alternatives with those thresholds.

EPA guidelines describe the types of projects that could require a quantitative PM_{10} hot-spot analysis (EPA 2010):

- Projects on a new highway or expressway that serve a significant volume of diesel truck traffic, such as facilities with more than 125,000 annual ADT where 8 percent or more of such traffic is diesel truck traffic;
- New exit ramps and other highway facility improvements that connect a highway or expressway with a major freight, bus, or intermodal terminal;
- Expansion of an existing highway or other facility that affects a congested intersection (operating at LOS D, E, or F) by significantly increasing the number of diesel trucks; or
- Similar highway projects that involve a significant increase in the number of diesel transit buses and/or diesel trucks.

The proposed action would serve a maximum of approximately 70,000 vehicles per day in the most heavily traveled segment of the study area—less than the 125,000 vehicles per day guideline suggested by EPA when quantitative modeling could be warranted. The projected percentage of diesel truck traffic could exceed the 8 percent guideline suggested by EPA; however, the number of trucks would be less than EPA's 10,000-vehicle guideline.

The proposed action is located in a maintenance area for federal CO standards. Therefore, a hot-spot analysis would be required for local conformity.

In addition to the relatively low volume of traffic on the proposed action, the LOS in all segments would be acceptable (LOS A, B, or C). Under these conditions—low traffic volumes and acceptable LOS—it is unlikely that the proposed action would be considered a project of air quality concern or that the vehicle emissions would be substantial.

In addition to the relatively low traffic volumes and the acceptable LOS expected in 2040, future trends in vehicle emissions will reduce the likelihood of substantial air quality impacts associated with the proposed action. Future trends include reformulated gasoline, low-emission vehicles, implementation of Tier 3 motor vehicle emissions standards, gasoline sulfur control, heavy-duty diesel engine programs, and on-highway diesel sulfur control programs. Programs intended to reduce vehicle emissions also include the strategies, standards, and procedures described below.

In December 2000, EPA issued its final rule in a two-part strategy to reduce diesel emissions from heavy-duty trucks and buses. The standards pertain to diesel engines found in vehicles weighing over 8,500 pounds beginning in model year 2004.

Additional standards and procedures were implemented in 2007. EPA required diesel fuel refiners to produce diesel fuels (for highway vehicle use) with a sulfur content of no more than 15 parts per million, a 97 percent reduction from the previous level of 500 parts per million.

In April 2014, EPA finalized its Tier 3 motor vehicle emission and fuel standards. The program considers the vehicle and its fuel as an integrated system, setting new vehicle emissions standards and lowering the sulfur content of gasoline beginning in 2017. The vehicle standards will reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The gasoline sulfur standard will enable more stringent and more effective control systems, which will reduce criteria pollutants and also reduce MSATs, discussed in the next section.

Mobile Source Air Toxics

FHWA has developed a tiered approach to analyzing MSATs in environmental documents (FHWA 2012a). Under FHWA's approach, three levels of analysis are identified, depending on the project circumstances and other considerations:

- No analysis is required for projects with no potential for meaningful MSAT effects.
- Qualitative analysis is required for projects with low potential MSAT effects.
- Quantitative analysis is required to differentiate alternatives for projects with higher potential MSAT effects.

As noted in the guidance, FHWA expects most projects to have a low potential for MSAT effects. Projects with low potential MSAT effects include those that are intended to improve the operations of highway, transit, or freight facilities without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. Examples of projects with low potential MSAT effects include highway widening projects, new traffic interchanges, and projects for which the design-year traffic volume is projected to be less than 140,000 to 150,000 vehicles per day.

The maximum traffic volume on the proposed action in 2040 is expected to be about 70,000 vehicles per day—below FHWA's suggested guideline of 140,000 to 150,000 vehicles per day (at which point a more quantitative analysis of MSAT effects might warrant consideration).

The amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each action corridor alternative. As shown in Table 3.7-4, the VMT estimated for each action corridor alternative is slightly higher than for the No-Action Alternative. The increase in VMT would lead to slightly higher MSAT emissions; however, the emissions increase would be offset by lower MSAT emission rates attributable to increased speeds (the freeway would operate at LOS A, B, or C). According to EPA's MOVES2014 model, emissions for all of the priority MSATs decrease as speed increases. Because the estimated VMT for each action corridor alternative is nearly the same, varying by less than 5 percent among the alternatives, no appreciable difference in overall MSAT emissions among the action corridor alternatives is expected.

Also, regardless of the alternative chosen, MSAT emissions will be lower in the future as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures; however, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

Greenhouse Gas Emissions

To date, no national standards have been established regarding GHGs, nor has EPA established criteria or thresholds for ambient GHG emissions. From a quantitative perspective, global climate change is the cumulative result of numerous and varied emissions sources (in terms of both absolute numbers and types), each of which makes a relatively small addition to global atmospheric GHG concentrations. In contrast to broad-scale actions such as those involving an entire industry sector or very large geographic areas, it is difficult to isolate and understand the climate impacts of GHG emissions for a particular transportation project. Furthermore, at present, no scientific methodology is available for attributing specific climatological changes to a particular transportation project's emissions.

Under NEPA, detailed environmental analysis should focus on issues that are significant and meaningful to decision making. Based on the nature of GHG emissions and the small potential GHG impacts associated with the proposed action, GHG emissions would not result in significant adverse impacts.

The GHG emissions from the action corridor alternatives would be insignificant and would not play a meaningful role in determining an environmentally preferable alternative. For these reasons, no project-level GHG analysis has been performed for this proposed action.

3.7.5 Potential Avoidance, Minimization, and Mitigation Strategies

Because the proposed action would not cause violations of existing air quality standards, and would cause small increases for other pollutants such as MSATs and GHGs, no mitigation measures are proposed.

To avoid and minimize air quality impacts during construction, best management practices would be recommended, such as minimizing wind-blown dust from blasting, particularly near community areas; control and/or avoidance of blasting on days with high winds; and/or the development of a traffic control plan to minimize traffic flow interference from construction equipment movement and activities. Specific measures would be determined during Tier 2 studies.

Appendix D, *Summary of Avoidance, Minimization, and Mitigation Strategies*, contains a consolidated list of strategies to address environmental impacts.

3.7.6 Subsequent Tier 2 Analysis

The Tier 2 analysis would be required to demonstrate that the proposed project has been modeled with a conforming regional transportation plan. In addition, the analysis would need to demonstrate that the project is consistent with local conformity requirements. The need for quantitative hot-spot modeling, if necessary, will be determined through interagency consultation for Tier 2 alternatives (that is, a determination of whether the proposed action is a project of air quality concern under ADOT guidelines).

Subsequent analyses related to air quality for the Tier 2 environmental evaluation should involve a review of current air quality attainment status in the study area and a review of the most recently available air quality monitoring data to document existing air quality conditions in the study area. This review should be followed by an updated analysis of the proposed action's contributions to future regional air quality conditions and a review of transportation conformity requirements, if applicable, at the time of the Tier 2 evaluation. GHG emissions could be quantitatively assessed in the Tier 2 NEPA analysis using EPA's Motor Vehicles Emissions Simulator model. During Tier 2 studies, specific measures to avoid or minimize construction-related air quality impacts and GHG emissions would be identified.

3.7.6.1 Conclusion

No issues related to air quality have been identified that would preclude construction of the proposed action within any of the proposed action corridor alternatives. Based on available information such as expected traffic volumes in 2040, the LOS throughout the study area, and a comparison of the action corridor alternatives with FHWA and EPA guidance, implementation of the proposed action would not result in substantial vehicle-related air emissions and, therefore, would not likely cause an exceedance of the applicable transportation-related criteria pollutants for which NAAQS have been established. Given EPA's ongoing programs to control hazardous air pollutants from mobile sources, MSAT emissions are expected to decrease in the future. The VMT with any of the action corridor alternatives would be similar, therefore, no appreciable difference in overall MSAT emissions among the various alternatives is expected. Further, the proposed action would reduce congestion on the local transportation network and would remove pass-through traffic from key local roadways in the study area, resulting in decreased travel times in the study area.

3.8 Noise

This section describes potential traffic noise impacts resulting from the proposed action between US 60 and I-10, a distance of approximately 45 miles. Table 3.8-1 summarizes potential noise levels associated with various types of sound sources. Appendix G, *Noise Information*, has additional information regarding the noise analysis.

Table 3.8-1. Common outdoor and indoor noise levels

Common outdoor noise levels	Noise level (dBA[a])	Common indoor noise levels
—	110	Rock band
Jet flyover at 350 meters	100	—
Gas lawn mower at 1 meter, diesel truck at 15 meters	90	Food blender at 1 meter
Noisy urban daytime	80	Garbage disposal at 1 meter
Gas lawn mower at 30 meters	70	Shouting at 1 meter, vacuum cleaner at 3 meters
Commercial area	60	Normal speech at 1 meter
Quiet urban daytime	50	Large business office, dishwasher next door
Quiet urban nighttime	40	Small theater; large conference room (background)
Quiet suburban nighttime	30	Library
Quiet rural nighttime	20	Concert hall (background)
—	10	Broadcast and recording studio
—	0	Threshold of hearing

Source: American Association of State Highway and Transportation Officials (1993)
[a] A-weighted decibel

Traffic noise is generated by vehicles passing by and includes noise from tires on the pavement, engines, and exhaust (additional vehicle components that can affect overall traffic noise include engine fans and other auxiliary equipment). Factors that affect the potential noise impacts of a transportation project include the following:

- traffic volume (for example, 2,000 vehicles per hour sounds twice as loud as 200 vehicles per hour)
- number of trucks in the traffic flow (for example, one truck at 55 mph sounds as loud as 10 cars at 55 mph)
- traffic speed (for example, traffic at 65 mph sounds twice as loud as traffic at 30 mph)

In addition, the distance between the noise source and sensitive receptors is important when considering impacts of the proposed action.

3.8.1 Regulatory Context

If federal funding is associated with construction of a highway on a new location, potential noise impacts must be evaluated. FHWA developed noise regulations as required by the Federal-Aid Highway Act

of 1970 (Public Law 91-605, 84 Stat. 1713). The regulation, 23 CFR Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, applies to highway construction projects where a state department of transportation has requested federal funding for participation in the project.

The noise evaluation conducted for the proposed action was performed consistent with FHWA guidelines for assessing highway traffic noise (FHWA 2011b) and the most current version of the ADOT *Noise Abatement Requirements* (NAR).

3.8.2 Methodology

FHWA's Noise Abatement Criteria (NAC), as implemented by the State of Arizona, define the noise levels considered to have an adverse effect on various land use categories (for example, residential or commercial land uses). The evaluation represents a corridor-level assessment based on limited design information and traffic information and other related assumptions available at the time of the analysis. The procedure used to evaluate noise impacts included the following steps:

- Identify noise-sensitive land uses in the Corridor.
- Determine existing noise levels by taking peak-hour traffic noise measurements.
- Predict future noise levels using available traffic information and the Traffic Noise Model, Version 2.5.
- Determine traffic noise impacts at noise-sensitive receivers by comparing predicted noise levels in the planning year (current year plus 20 years) with the appropriate NAC.
- Qualitatively describe noise impacts from project construction activities.
- Evaluate potential noise mitigation measures, if warranted.
- Provide information to local land-use planning agencies regarding future year noise levels for their use in making land use decisions regarding undeveloped or unpermitted areas in the corridor.

The worst-case traffic noise volumes in each segment of the Corridor were used to model expected noise impacts. If future noise levels approach or exceed the NAC, they are considered noise impacts under ADOT's NAR. The NAR are listed in Table 3.8-2. As defined by ADOT, the "approach" criteria is 1 A-weighted decibel (dBA) below the FHWA NAC shown in Table 3.8-2.

The methodology used to evaluate potential noise impacts included a screening-level assessment of the potential for noise impacts based on existing noise levels and proximity of the action corridor alternatives to sensitive noise receptors in the study area. As part of the Tier 1 qualitative approach to noise impact analysis, existing ambient noise levels were determined at a number of undeveloped and developed locations in the study area to provide a context for the Corridor's noise environment. The screening-level assessment identified the potential for noise-sensitive land uses to experience future noise conditions associated with the action corridor alternatives that exceed the NAC impact criteria.

ADOT's NAR has specific requirements for analyzing the feasibility, reasonableness, and cost-effectiveness of noise abatement measures such as noise barriers and earthen berms. The abatement evaluation requires specific design details that are not available for this Tier 1 study. As a result, a detailed noise abatement evaluation is not possible at this preliminary stage.

Table 3.8-2. Noise Abatement Criteria

Activity category	dBA $L_{eq}(h)^{a, b}$	Activity description
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Residential
C	67 (exterior)	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio structures, recording studios, schools, and television studios
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in categories A to D or F
F	—	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	—	Undeveloped lands that are not permitted

Sources: Federal Highway Administration (2011b); 23 Code of Federal Regulations Part 772
Note: Activity Categories B, C, and E include undeveloped lands permitted for each activity category.
[a] The 1-hour equivalent sound level in A-weighted decibels, which is the logarithmic average of noise over a 1-hour period.
[b] The $L_{eq}(h)$ activity criteria values are for impact determination only, and are not design standards for noise abatement measures.

3.8.3 Affected Environment

Existing noise level measurements were recorded at 23 locations in the study area between July 27 and July 28, 2015, and are shown in Table 3.8-3 (FHWA 1996b).

Table 3.8-3. Existing noise level measurements

Location	L_{eq}[a]	Notes	Type of location
Segment 1			
Apache Golf Course	65	Local traffic on Baseline Road; aircraft	Near development
38th/Winchester Road	51	Local traffic on Winchester Road; cannot hear traffic on US 60	Near development
Baseline Road/Goldfield Road	53	Passby traffic on Baseline and Goldfield Roads	Near development
Race car track on Ironwood Drive	60	Traffic on Ironwood Drive	Near development
Germann Road east of Coyote Road	60	Local traffic on Germann Road	Near development
Eastern end of Ocotillo Road	42	No traffic; very quiet	Near development
Combs Road/Sierra Vista Drive	51	Slight breeze; no traffic	Nearly undeveloped
Skyline Drive (east of Quail Run Lane)	47	Local traffic	Undeveloped area
Corner of Skyline Drive/Felix Road	48	Light breeze; aircraft	Undeveloped area
East Judd Road/Felix Road	45	Local residential traffic; two aircrafts	Near development

Table 3.8-3. Existing noise level measurements

Location	L_{eq}[a]	Notes	Type of location
Segment 2			
Heritage Road/Felix Road (Crestview Manor)	43	Light traffic on Felix Road; aircraft; birds	Near development
Segment 3			
Hunt Highway/West of Largo Road	55	Traffic on Hunt Highway	Undeveloped area
Hunt Highway/Poston Butte Road	54	Traffic on Hunt Highway	Undeveloped area
Florence's Heritage Park	44	Operating pump at aquatic center	Near development
Adamsville Road – west of Florence	53	Light traffic on Adamsville Road	Nearly undeveloped
Valley Farms Road/Vah Ki Inn Road	40	Plowing in adjacent field	Nearly undeveloped
Clemans Road/Martin Road	47	Dirt farm roads, no traffic; aircraft	Nearly undeveloped
Randolph Road/Vail Road	47	Farm road; no traffic	Nearly undeveloped
Segment 4			
Steele Road/Fast Track Road	46	Farm roads; no traffic	Undeveloped area
SR 87/Selma Road (east of railroad)	40	Dirt road, no traffic; aircraft; birds	Undeveloped area
Shedd Road at railroad tracks	40	Dirt road, no traffic; cannot hear SR 87	Nearly undeveloped
SR 87/Battaglia Road (east of railroad)	37	Dirt farm road; no traffic	Undeveloped area
Milligan Road/Vail Road (east of railroad)	42	Local road, no traffic	Undeveloped area

Notes: SR = State Route, US 60 = U.S. Route 60
[a] equivalent sound level

Segment 1, which is the segment closest to US 60, has the highest traffic volumes in the study area and includes the Palmas del Sol East and Desert Harbor residential developments to the west and other commercial land uses on Ironwood Drive and Baseline Road. Measurements at locations in Segment 1, north of Baseline Road, consisted of three 15-minute-long measurements that were then averaged and rounded to the nearest whole dBA. South of Baseline Road and throughout the rest of the study area, the noise receiver locations were generally in undeveloped or agricultural areas with few nearby sources of noise, such as passby traffic or industrial activities. At these locations, a single noise measurement was taken for a 15-minute period.

The results of the noise measurements indicate that the noise levels throughout the study area near developed areas range from a low of 42 dBA to a high of 65 dBA, and have an average of 51 dBA. In undeveloped areas, where no existing noise-sensitive receptors are located, noise levels range from a low of 35 dBA to a high of 55 dBA, with an average of 46 dBA. Areas that are nearly undeveloped—that is, where very few sensitive receptors could be affected by traffic noise—noise levels range from a low of 40 dBA to a high of 53 dBA, and have an average of 47 dBA. In general, measured noise levels were consistent with the prevailing land uses, with higher noise levels in the more urban areas and lower noise levels elsewhere.

3.8.4 Environmental Consequences

A qualitative assessment of potential noise impacts is presented below based on existing land uses within and near the action corridor alternatives.

3.8.4.1 No-Action Alternative

Under the No-Action Alternative, the proposed action would not be constructed. Land uses would remain undeveloped or agricultural until development occurs as planned by local jurisdictions. Under the No-Action Alternative, no traffic noise would be associated with the proposed action. Noise levels throughout the study area would be similar to those shown in Table 3.8-3.

3.8.4.2 Action Corridor Alternatives

Noise impacts would vary depending on the distances between the freeway alignment determined in subsequent Tier 2 studies and noise-sensitive receptors in the study area.

Sample modeling of potential traffic noise in the study area was performed for two land use categories: Activity Categories B (residential) and G (undeveloped land). As discussed in ADOT's NAR, no highway noise analysis is required for agricultural land uses (Activity Category F), the third type of land use category near the action corridor alternatives in the study area.

Residential Developments (Activity Category B Modeling)

For Activity Category B, the noise evaluation focused on areas of active, permitted residential developments. Under the ADOT NAR, permitted developments are those locations with a definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of a building permit.

The action corridor alternatives are very close to three subdivisions in Segment 1: Dolce Vita, east of Goldfield Road, and Palmas del Sol East and Desert Harbor, west of Ironwood Drive.

Because of the proximity of these residential developments to the action corridor alternatives, preliminary noise modeling was conducted at these locations.

RESIDENTIAL DEVELOPMENT EAST OF GOLDFIELD ROAD

The E1a, E1b, and W1b Alternatives connect with US 60 near the homes in the Dolce Vita subdivision, located east of Goldfield Road. Ten receptors were modeled in the Dolce Vita development based on potential distances of 300 or more feet from the edge of the action corridor alternative. Modeled noise levels in the residential development ranged from 49 dBA to 62 dBA; therefore, the residential NAC would not be exceeded.

RESIDENTIAL DEVELOPMENTS WEST OF IRONWOOD DRIVE

Two residential developments (Palmas del Sol East and Desert Harbor) are just south of US 60, along Ironwood Drive, close to the W1a Alternative. A Tier 2 alignment may require the acquisition of property from either the homes to the west or the adjacent Apache Golf Course to the east, or both. Given the potential risk of property acquisitions in the Palmas del Sol East development to accommodate the proposed action, noise impacts would likely affect nearby homes not acquired.

Eleven receptors were modeled in this location, and the existing privacy wall adjacent to Ironwood Drive was included in the model as a 5-foot-tall barrier. In addition, rows of homes were included in the noise model to account for additional noise attenuation resulting from intervening rows of homes. A background noise level of 65 dBA was used in the model to reflect the short-term noise measurement taken at the Apache Golf Course monitoring location. The modeled noise levels ranged from 55 dBA to 69 dBA at a

distance of at least 300 feet from the potential edge of the corridor. The residential NAC was approached at two receptors and was exceeded at one receptor. Therefore, there is a high potential risk of noise impacts at sensitive receptors associated with the W1a Alternative.

Undeveloped Areas (Activity Category G Modeling)

For unpermitted, undeveloped land uses (Activity Category G), the ADOT NAR recommends modeling at two receiver locations: one at the edge of the ROW line (in this evaluation, the edge of the corridor) and a second approximately 300 feet from the first location to determine the degree of noise attenuation over distance from the action corridor alternatives. For this Tier 1-level analysis, where action corridor alternatives are considered and no ROW is delineated, this approach was modified and 12 locations were identified in undeveloped areas in the study area, generally 6 near the Eastern Alternatives and 6 near the Western Alternatives. These undeveloped areas span all four segments of the study area and exclude the predominantly residential developments previously described and evaluated under Activity Category B. Noise modeling for the Activity Category G land use areas was conducted using the peak-hour traffic volume in 2040 and accounted for minor elevation differences between the locations. Table 3.8-4 shows results of the Activity Category G evaluation.

With the Eastern Alternatives, noise levels would range from 71 dBA to 76 dBA adjacent to the alignment, decreasing to 60 dBA or lower as the distance increases between the alignment and the receptor. Noise levels adjacent to an alignment within the Western Alternatives would be slightly higher across the board: as high as 79 dBA in Segment 1 and decreasing to 74 dBA in Segment 4. As the distance increases between the alignment and the sensitive noise receptor, noise levels would decrease accordingly. The small difference in noise levels between the action corridor alternatives would not be perceptible to the human ear. Modeled noise levels decrease slightly from Segment 1 to Segment 4 because of lower traffic volumes as the proposed action goes from north to south. Based on this assessment, the residential NAC (67 dBA) would not be approached at locations 300 feet or farther from a potential edge of corridor with any of the action corridor alternatives.

Table 3.8-4. Activity Category G modeling (unpermitted, undeveloped land uses)

Segment	Eastern Alternatives' noise levels (dBA)		Western Alternatives' noise levels (dBA)	
	At potential corridor edge	300 feet from potential corridor edge	At potential corridor edge	300 feet from potential corridor edge
Segment 1	76	60	79	62
Segment 2	75	60	76	61
Segment 3	74	58	76	60
Segment 4	71	55	74	57

Note: dBA = A-weighted decibel

However, a Tier 2 alignment that is closer than 300 feet from a sensitive noise receptor may approach or exceed the residential NAC (67 dBA) depending on distance. For portions of the action corridor alternatives that overlay homes, a Tier 2 alignment developed and evaluated in more detailed Tier 2 noise analyses has the potential to be within 300 feet of one or more receptors.

In Segment 1, both the W1a and W1b Alternatives overlay up to 20 homes between Rolling Ridge Road and Skyline Drive west of Quail Run Road, several of which are close to the center of the action corridor alternatives. Both the E1a and E1b Alternatives overlay up to 12 homes between Roberts and Asbury Roads, west of Felix Road; however, these homes are closer to the eastern corridor edge of the action

corridor alternatives. Therefore, in Segment 1, the potential for noise impacts attributable to a Tier 2 alignment located closer than 300 feet to the receptors is greater with the W1a and W1b Alternatives than with the E1a and E1b Alternatives.

In Segment 3, the W3 Alternative is close to multiple noise-sensitive receptors in the residential development between Heritage Road and Hunt Highway, and a Tier 2 alignment could be located more than 300 feet from the receptors. However, the W3 Alternative overlays a few isolated developed properties along its length, and there is a low potential risk for a Tier 2 alignment to be developed within 300 feet of these receptors, resulting in less potential for the residential NAC to be approached or exceeded. Similarly, the E3c and E3d Alternatives overlay isolated homes, resulting in a low potential risk for a Tier 2 alignment to be developed within 300 feet of receptors. The E3a and E3b Alternatives between Randolph and Kleck Roads overlay 17 developed properties, and there is a moderate potential risk for a Tier 2 alignment to be located within 300 feet of the properties, resulting in a greater potential for the residential NAC to be approached or exceeded.

In Segment 4, the E4 Alternative overlays very few isolated homes, and a Tier 2 alignment could likely avoid locations within 300 feet of these receptors. Moreover, the modeled noise level of the proposed freeway adjacent to sensitive receptors in this segment is 71 dBA, much lower than in other segments. Therefore, there is a minimal potential for the residential NAC to be approached or exceeded with the E4 Alternative. On the other hand, the W4 Alternative corridor overlays multiple homes west of SR 87 between Shedd and Houser Roads and other isolated properties along SR 87. It is unlikely that a Tier 2 alignment would avoid all of these properties and be located more than 300 feet from the receptors; therefore, there is a greater potential for the residential NAC to be approached or exceeded with the W4 Alternative.

3.8.5 Potential Avoidance, Minimization, and Mitigation Strategies

As a general matter, new freeway alignments constructed in otherwise quiet noise environments often result in a substantial noise increase at nearby homes (that is, 15-dBA or greater increases over existing noise levels). Under such circumstances and depending on the number of homes affected, detailed consideration of noise barriers would be warranted. Depending on the alignment selected in subsequent Tier 2 studies, expected noise impacts identified at homes may warrant noise abatement measures.

Appendix D, *Summary of Avoidance, Minimization, and Mitigation Strategies*, contains a consolidated list of strategies to address environmental impacts.

3.8.6 Subsequent Tier 2 Analysis

During Tier 2 studies for one or more well-defined projects, noise analyses would involve detailed noise modeling with FHWA's Traffic Noise Model, quantification of noise impacts by individual receptors and activity category, and examination of the feasibility and reasonableness of noise abatement for all affected receptors.

The noise study would include the following steps:

1. Identify noise-sensitive land uses in the study area, including approved developments.
2. Determine existing noise levels by taking peak-hour traffic noise measurements at representative locations.
3. Predict future noise levels using available traffic information and modeling with FHWA's Traffic Noise Model.
4. Determine traffic noise impacts at noise-sensitive receptors by comparing predicted noise levels in the planning year (current year plus 20 years) with the appropriate NAC.

5. Identify noise mitigation measures that are feasible and reasonable and meet the cost-effectiveness requirements of ADOT's NAR that are in place at the time of the Tier 2 analysis.

3.8.6.1 Conclusion

Based on the screening-level assessment of the study area and the potential effects of the proposed action on noise-sensitive receptors within and near the action corridor alternatives, there is a high risk of potential noise impacts in Segment 1 with the W1a Alternative because of its proximity to existing homes along Ironwood Drive. Residential areas more than 300 feet from a Tier 2 alignment with the W1b, E1a, and E1b Alternatives are not expected to experience exceedances of the residential NAC (67 dBA). However, there is a low potential risk that isolated properties may be located within 300 feet of a Tier 2 alignment and, therefore, experience noise impacts.

In Segments 2, 3, and 4, the residential NAC would not be approached or exceeded within 300 feet from a Tier 2 alignment in any of the action corridor alternatives. In some locations where an action corridor alternative overlays homes, there is a potential risk that the Tier 2 alignment may be located within 300 feet of the receptors, resulting in potential noise impacts. This potential risk is higher with the E3a, E3b, and W4 Alternatives.

3.9 Visual Resources

This section provides an overview of the study area's visual resource setting and preliminary information concerning visual resource conditions in the action corridor alternatives.

3.9.1 Regulatory Context

The assessment of aesthetic impacts of proposed actions is grounded in federal law, policy, and agency regulations. NEPA (42 USC §§ 4331 to 4332) requires the federal government to use all practicable means to "assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings …" [Section 101(b)(2)]. To this end, federal agencies are directed to identify and develop methods and procedures "which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations …" [Section 102(2)(B)].

Title 23 of the USC, which governs FHWA, also calls for balancing the costs of minimizing or eliminating "the destruction or disruption of manmade and natural resources," specifically including "esthetic values."

The FHWA Technical Advisory, Guidance for Preparing and Processing Environmental and Section 4(f) Documents (1987), specifically calls for an assessment of the relationship of the impacts to potential viewers of and from the project, as well as measures to avoid, minimize, or reduce the adverse impacts.

3.9.1.1 National Environmental Policy Act

The proposed action would mostly be funded using federal monies and thus is subject to federal NEPA regulations. NEPA requires that proposed federal actions consider potential likely effects on the environment, and visual resources are considered an integral part of that environment.

3.9.1.2 Federal Highway Administration Visual Impact Assessment

FHWA has two assessment guidance documents, the 1981 *Visual Impact Assessment for Highway Projects* and the more recent 2015 *Guidelines for the Visual Impact Assessment of Highway Projects*. The latter document was the primary methodology guide for this study, with support from the former.

3.9.1.3 Bureau of Land Management Visual Resource Management

BLM manages several parcels in the study area. The scenic values of these parcels (depicted later in this section in Figure 3.9-1), based on BLM data, are considered either Class III or IV, out of a four-class system. The objective for managing Class III land is to partially retain the landscape's existing character. The Class IV objective is to provide management activities for major modifications of the landscape's existing character.

3.9.2 Methodology

The evaluation presented in this section was based on a preliminary field review (2015) that was conducted to document existing conditions in the study area. The evaluation was also based on guidance outlined in the FHWA 2015 *Guidelines for the Visual Impact Assessment of Highway Projects*. The study phases consisted of establishing a study area based on landscape constraints and human sight, inventorying the existing visual quality, analyzing the impacts of the proposed action on visual quality, and, in the final stages, defining mitigation and enhancement efforts. The level of analysis for this visual resources assessment provides a broad overview of existing conditions and potential impacts, given the lack of detailed facility design at the Tier 1 level.

3.9.3 Affected Environment

The visual aesthetic quality of a community is an integral component of community identity. Visual aesthetics concern both the character of the visual experience and the effect on the viewer. Assessing visual quality is subjective; however, federal, state, and local policies and guidelines provide advice as to what the general public considers a desirable visual environment.

The regional landscape establishes the general visual environment of a project. The existing visual landscape in the study area encompasses features of both the natural (geography, ecology, etc.) and built (buildings, roads) environments, as described below. Areas that are generally recognized as sensitive include homes, parks, water bodies, historic or culturally important resources, and public facilities.

3.9.3.1 Natural Environment

Topography

The study area is in the western United States in the Basin and Range Province, which has a characteristic topography familiar to anyone fortunate enough to come across it—steep climbs up long mountain ranges, alternating with long expanses of flat, dry deserts, in a repeating fashion. Within this province, the Earth's crust was stretched, resulting in a thinned and cracked crust that pulled apart, creating large, roughly north-to-south faults. Along these faults, mountains were uplifted and valleys were dropped down, producing the distinctive alternating pattern of linear mountain ranges and valleys (U.S. Geological Survey [USGS] 2000). The flat desert floor provides the ability to see great distances.

Northeast of the northern end of the study area are the Superstition Mountains, at an elevation of 5,000 feet. The Superstition Mountains are recognized by their distinctive light-colored escarpment. Midway in the study area, between Florence and Queen Creek, are the San Tan Mountains, with an elevation of 3,100 feet. Due south of the southern end of the study area is Picacho Peak, a distinctive landmark at 3,300 feet high. Also at the southern end and to the east are the Picacho Mountains, with an elevation of 4,400 feet.

Water

The proposed action corridor alternatives would cross the Gila River about halfway through the study area. The Gila River begins in New Mexico, crosses Arizona from east to west, and contributes to the Colorado River. The Gila River has been dammed upstream, and now flows only intermittently. Its typical appearance in the study area is a dry, sandy riverbed with not enough water to support much riparian habitat.

The CAP Canal parallels and intersects the action corridor alternatives. It carries water from the Colorado River to Phoenix and Tucson and always has water. Other smaller canals crisscross the study area.

Picacho Reservoir is near the southern end of the study area. The water level is highly variable, and the reservoir is sometimes completely dry. When it has enough moisture to create a shallow lake, it becomes a local recreation destination.

Weather

Central Arizona has sparse precipitation (less than 8 inches per year) that comes mostly in the summer monsoons and winter rains. It is almost always sunny and clear. Occasional dust storms, which can completely obscure visibility for short periods, accompany the summer monsoons.

Vegetation

The biome is the Lower Colorado River Subdivision-Sonoran Desertscrub. Desertscrub is a shrub-dominated community. Characteristic plant species include creosote bush, white bursage, ocotillo, brittlebush, foothill paloverde, fourwing saltbush, and ironwood. In desert washes, xeroriparian habitat—which includes mesquite, ironwood, catclaw acacia, foothills and blue paloverde, desert willow, and smoketree—can be found. Mesquite bosques also are characteristic along ephemeral washes dominated by xeroriparian communities on terraces above perennial riparian zones within the arid Southwest. Numerous washes cross the action corridor alternatives; however, many have been truncated by agricultural activities and canals, and many terminate at retention basins.

Plant density within the study area generally is open and simple, with concentrations along rivers and washes. Trees are only about 25 feet high; shrubs are generally short (under 8 feet). Trees and shrubs have an open, sparse structure. Vegetation appearance is generally the same year round, although it can be sparser in the summer. Colorful wildflowers appear in the spring, but the amount and density depends on the winter rains. Over half of the study area, generally to the east, is undeveloped desert where this biome can be observed.

The western third of the study area is under agricultural production, and any natural desert biome has been completely removed. The agricultural production is generally laid out in a mile grid, creating a geometric pattern of changing shades of green. Clusters of vertical, often nonnative, trees exist at rural residential locations. For further discussion of plant communities in the study area, see Section 3.11.3.1.

Wildlife

Wildlife in the study area includes mammals (mule deer, javelina, foxes, squirrels, rabbits, and mice), birds (doves, thrashers, sparrows, cactus wrens, quail, owls, and hawks), amphibians (toads), and reptiles (lizards, snakes, and tortoises). Agricultural areas within the study area could provide breeding habitat for nesting birds and forage for numerous species (see Section 3.11.3.1 for further information).

3.9.3.2 Built Environment

Most of the study area consists of native desert or rural agriculture with very low-density housing. Houses and accessory buildings are low. Most of the roads are two lanes wide, paved or unpaved, structured in a grid pattern with power lines paralleling the major roads. The predominant types of human-made structures are houses, farm accessory buildings, and commercial buildings. Historical buildings and structures in the study area are described in Section 3.14, *Cultural Resources*.

The towns of Queen Creek, Florence, Coolidge, and Eloy are located along or adjacent to the action corridor alternatives. Eastern Queen Creek is developing into a suburban community typical of the Phoenix metropolitan area, where residential subdivisions of one- to two-story stucco houses are interspersed with shopping centers. Florence, Coolidge, and Eloy are rural communities with typically one main thoroughfare of businesses surrounded by low-density, low-building-height homes.

3.9.3.3 Assessment Methodology

According to FHWA guidelines, the visual impacts of a project are determined by assessing the visual resource change that would occur as the result of the project, and by predicting viewer response to those changes, as described in further detail below.

Visual Resource Change

Visual resource change is the sum of the change in visual character and the change in visual quality. This change can be determined by assessing the compatibility of the project with the visual character of the existing landscape and then comparing the visual quality of the existing resources with the projected

visual quality after implementing the project. Visual character and visual quality are described in further detail below.

VISUAL CHARACTER

Visual character describes the basic visual components of the proposed action and was used to assess impacts. The description does not reference the affected environment or affected population or how the proposed action may affect them.

- Scale – The proposed freeway would range from approximately 50 to 61 miles long, depending on the action corridor alternative. Based on projected 2040 traffic volumes, it would be a six-lane facility, with shoulders and a median.
- Form – In plan view, the freeway would be curvilinear in form. Service traffic interchanges would occur at approximately 2-mile intervals, connecting the new freeway with east-to-west roads with vertical overpasses and associated built-up ramps. Toward its northern end, the freeway would intersect with SR 24, which would connect the Santan Freeway with the Corridor; the two possible connection points would be system traffic interchanges. System traffic interchanges would also be built at the freeway's connections with US 60 and I-10.
- Materials – Materials are not known at this time. Typical ADOT overpasses are a combination of mechanically stabilized earth walls and cast-in-place concrete. Most ADOT freeways have an associated artistic theme, with elements of the theme reflected on vertical elements such as walls and sometimes in landscaped graphics. The main line freeway paving would likely be asphalt or concrete.
- Visual Attributes – The visual attributes of major structures and common structures are not known at this time. Typical of other ADOT freeways, the proposed freeway would have vertical light fixtures and signs.

VISUAL QUALITY

Visual quality describes the visual relationship between elements in the landscape. Visual quality also serves as the baseline for determining the degree of visual impacts—that is, if visual impacts are adverse, beneficial, or neutral. The evaluation criteria applied to this analysis include:

- Vividness – The memorability of landscape components as they combine in striking and distinctive visual patterns. Vividness is assessed using landform and land cover. Landform vividness is frequently determined by the pattern elements of form or line, such as the strongly defined skyline of a mountain landscape. Land cover consists of water, surface geology, vegetation, and human-made development. Areas with high vividness, for example, often contain water, which creates a vivid landscape component as a result of linear visual effects (such as a shoreline or the sharp edge of a waterfall) and color.
- Intactness – The visual order of the natural and built landscape of the immediate environs and its freedom from encroaching visual elements. Intactness can be assessed in terms of the quality of an area's natural visual appearance. Low intactness occurs when an unsightly human-made element ("eyesore") encroaches into an undisturbed natural area. High intactness is attributable to the natural visual order of an untouched landscape.
- Unity – The visual coherence and compositional harmony of the viewshed. The viewshed entails all natural and built features found within the normal view range. In built landscapes, it frequently attests to the careful design or fit of individual components in the landscape. Unity is generally used as a measure of how human-made and natural elements work together within the same visual unit. Human-made environments with no visual relation to natural landform or landcover patterns are usually considered to lack visual unity.

Viewer Response

The population affected by a project is referred to as viewers and includes those people who live in or regularly travel through the study area or who may have sensitivity to visual changes in the environment. Viewer types were considered in the evaluation because they respond to change differently. Viewer types can be defined by their location, their sensitivity to change, and their duration of exposure. These defining elements combine to form the anticipated viewer response to changes resulting from a project, and are described in further detail below:

- Viewer location dictates whether the views are to the facility or from the facility.
- Viewer sensitivity is defined both as the viewers' concern for scenic quality and the viewers' response to change in the visual resources that make up the view. Viewer sensitivity to visual change can be affected by distance between the viewer and visual resource, visibility of the resource within the landscape unit (which consists of areas with similar visual characteristics), and viewer expectation. Low viewer sensitivity results when there are few viewers who experience a defined view, or when they may be less focused on the view. High viewer sensitivity results when there are many viewers who have views of frequent or long duration. Sensitivity is usually higher for those viewers who live or work in a study area or who are driving or walking through for pleasure versus those who are commuting through the area. Residential viewers typically have the highest sensitivity because they have an extended viewing period and may be concerned about changes in the views from their homes.
- Viewer exposure is influenced by how people perceive change. Exposure is determined by assessing the number of viewers, their location, and the duration of their view. Residents living near the proposed facility have a view that is constant and long term, whereas a traveling viewer has limited-duration exposure.

Three viewer types were identified in the study area: residents, business owners/employees/clientele, and motorists (Table 3.9-1).

Table 3.9-1. Viewer types

Viewer	Description	Sensitivity to change
Residents	Residents are the most sensitive viewers. They spend the most time near the facility elements and most views are of the facility.	High
Business owners/ employees/clientele	People working in or visiting businesses spend typical business hours in the area or make frequent but short buying trips. Their views are both from and to the facility.	Low to moderate
Motorists	Motorists generally travel parallel to the facility; their exposure is short term and their views are from the facility.	Low

In the study area, residents and business owners/employees/clientele are the primary existing viewers. Many of these residents are rural homeowners who moved to or stay in the area for the rural, small-town ambience. Residents are likely to be the predominant users of the trails and parks in the study area and their sensitivity to change will be high. Existing motorists use the two- and four-lane roads in the area. Some of these motorists are local, using the roads to work the fields and drive to and from the towns, although they may also use them to travel to Phoenix or Tucson. These motorists may be more sensitive to an urban element in the landscape. Other motorists may use the local roads as a way to travel between Tucson and eastern Maricopa County, bypassing the longer trip by way of I-10. They are less likely to be sensitive to change, desiring a quick trip over surroundings.

3.9.3.4 Area of Visual Effect

The area of project visibility is referred to as the area of visual effect, which is determined by the physical constraints of the environment and the physiological limits of human sight. To define the area of visual effect, it is necessary to understand the types of viewsheds (static and dynamic) and the landscape units, as described in further detail below.

For most of the study area, little landform or land cover exists to fully obstruct fore-, middle-, or background views. Additionally, for most of the year, atmospheric conditions are clear and sunny. Static viewsheds for neighbors would depend on how close they are to the proposed action overpasses and system traffic interchanges. Dynamic viewsheds for travelers would also depend on their views from the at-grade freeway main line versus an elevated location on an overpass or system traffic interchange.

Landscape units are a portion of the regional landscape or study area, and are commonly used to divide long linear projects into logical geographic entities for assessment purposes. Landscape units generally are made up of areas with similar visual characteristics, although smaller locations within each landscape unit may differ from the overall unit's character. For the purposes of this Tier 1 analysis, the study area was divided into two major landscape units: Unit 1 in the north that includes all of Segments 1 and 2 and the northern portion of Segment 3 and Unit 2 in the south that includes the southern portion of Segment 3 and all of Segment 4 (Figure 3.9-1). Additional descriptions of the visual characteristics of the study area landscape units are provided below.

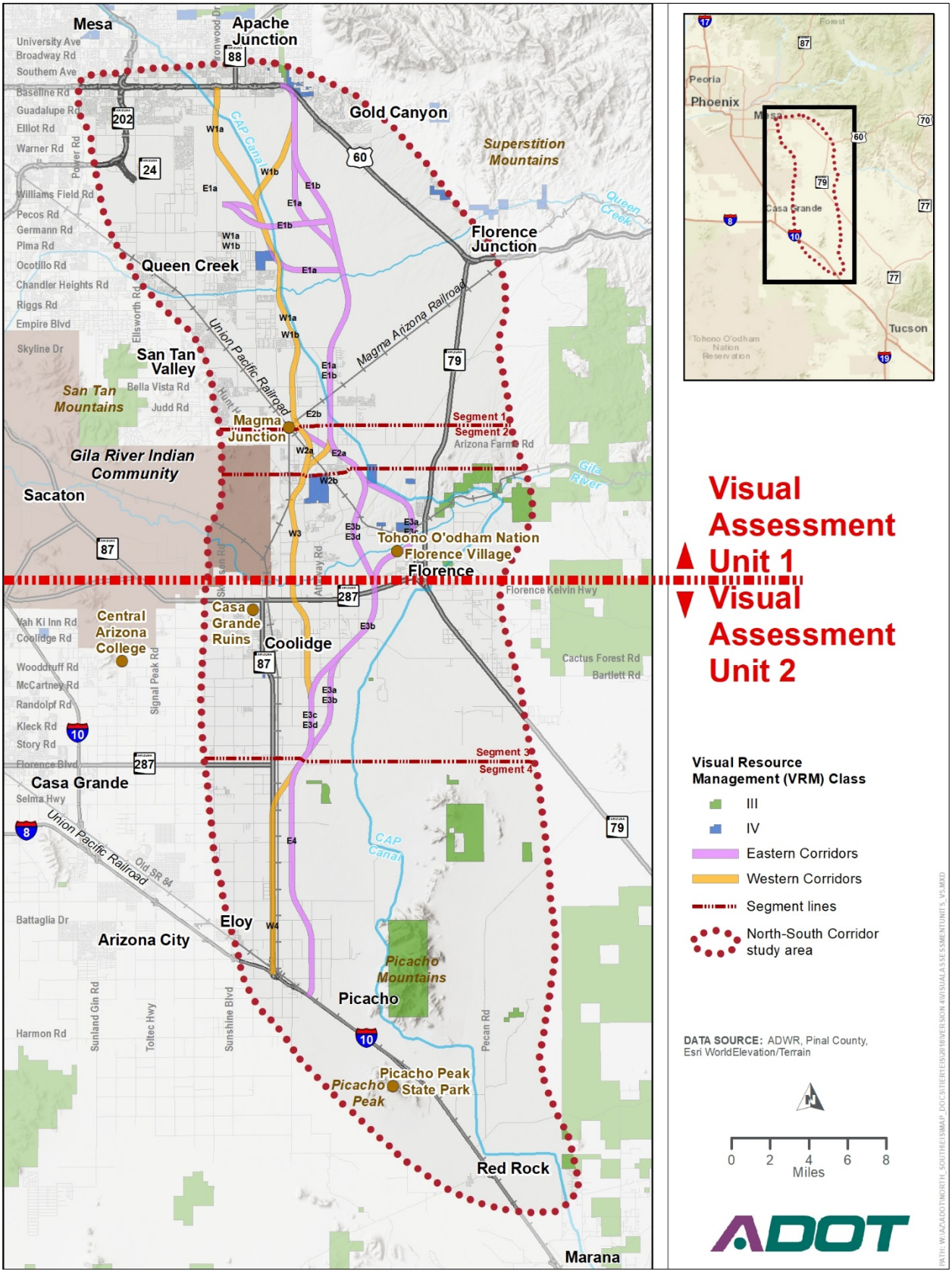
Unit 1

Unit 1 extends from US 60, in eastern Mesa/Apache Junction, to the southern side of the Gila River. The action corridor alternatives in this unit traverse mostly undeveloped desert. Developments are planned for much of this desert area, but at this time it is still natural desert, the openness of which provides nearby residents with distant views of surrounding mountains. Queen Creek, the largest community in this unit, is transforming from a rural, equestrian community into a bedroom community to the Phoenix metropolitan area. Florence, the second-largest community in the unit, is known for its downtown National Historic District and nine correctional facilities. This unit also encompasses the Gila River crossing. The riverbed in this area is wide, shallow, and braided, with little riparian vegetation to distinguish the riverine area from the surrounding desert. Table 3.9-2 describes the characteristics of Unit 1.

Table 3.9-2. Characteristics of Unit 1

Visual factor	Description
Land use	Undeveloped; some agricultural production; some rural very low-density residential
Building height	One story
Parking	Accessory to residential
Streets	Two-lane, paved and unpaved
Vegetation	Predominantly natural desert; ornamental at residences
Utilities	Power lines both small and large; traffic signals at some intersections
Viewers	Residents, motorists
Views	Background views to north and east of Superstition Mountains and to south and west of San Tan Mountains; middle and foreground views mostly desert, in some locations residential

Figure 3.9-1. Visual assessment units



Unit 2

Unit 2 extends between Florence and I-10 near Eloy. In Unit 2, the action corridor alternatives traverse primarily agricultural land. Eloy is the largest community in Unit 2, followed by Coolidge. Eloy has several correctional facilities and a large agricultural base; Coolidge has Casa Grande Ruins National Monument, although the ruins would not be visible from the freeway. Table 3.9-3 describes the characteristics of Unit 2.

Table 3.9-3. Characteristics of Unit 2

Visual factor	Description
Land use	Undeveloped; some agricultural production; some rural very low-density residential
Building height	One story
Parking	Accessory to residential
Streets	Two-lane, paved and unpaved
Vegetation	Predominantly rural agriculture; natural desert; ornamental at residences
Utilities	Power lines both small and large; traffic signals at some intersections
Viewers	Residents, motorists
Views	Background views to north and east of Superstition Mountains, to south and west of San Tan Mountains, and to south and east of Picacho Peak and Picacho Mountains; middle and foreground views of desert, agriculture, and in some locations residential

3.9.4 Environmental Consequences

To evaluate a project's impacts on visual quality, the visual resource change and viewer response are used to characterize the potential overall impact. Changes to the degree of visual quality are then assessed as beneficial, adverse, or neutral to the viewers' relationship with the visual environment.

3.9.4.1 No-Action Alternative

Under the No-Action Alternative, no visual impacts related to the proposed action would occur; however, continuing urban development in the region and study area would replace the desert and agricultural settings with urban forms, lines, and colors.

3.9.4.2 Action Corridor Alternatives

Impacts Common to All Action Corridor Alternatives

All action corridor alternatives would introduce new visual elements in the study area, including permanent and temporary project elements that would alter the study area's visual character. New permanent visual elements could include system traffic interchanges, cross street overpasses, the freeway main line, cut and fill areas, retaining walls, noise barriers, screening walls, and possibly lights, as described below:

- System traffic interchanges – New system traffic interchanges at US 60, SR 24, and I-10, with bridges and associated ramps, would change views from at-grade desert or agriculture to views of an elevated facility with vegetated or graveled slopes. The bridges and ramps would partially obstruct the views of motorists and other viewers in the vicinity.

- Overpasses – Should overpasses be the design solution, overpasses with bridges and associated ramps would change views from at-grade desert or agriculture to views of an elevated overpass with vegetated or graveled slopes. The overpasses would partially obstruct views of motorists on the cross streets. Generally, background views of mountains would not be obstructed except when close to the interchange structures (less than 0.25 mile). Views from the overpasses would improve views of the surrounding mountains for traveling motorists. If the freeway is depressed, at-grade views would be maintained.

Typical ADOT overpass (0.25 mile away)

Typical ADOT overpass (0.25 mile away)

- Main line – New main line pavement would add a linear, human-made element of either black asphalt or gray concrete to the landscape.
- Cut and fill – Cut and fill areas may occur with action corridor alternatives. Mitigation in the form of revegetation would make the visual change indiscernible from about 2 miles away and beyond. If the freeway is depressed, the visual change would be indiscernible much closer than 2 miles.
- Retaining walls – Retaining walls may be built with action corridor alternatives. Views may be obstructed by these walls; however, the exact locations are not known at this time.
- Noise barriers – Action corridor alternatives may include noise barriers. Distant views could be obstructed; however, the exact locations are not known at this time.
- Screening walls – Screening walls may be used to mitigate visual impacts caused by the proposed improvements. These walls would create a visual change and distant views could be obstructed; however, the exact locations are not known at this time.
- Lights – Lights, if used, could potentially increase nighttime glare and light pollution through the introduction of new sources of nighttime light in the study area, which include permanent, fixed sources that would be directed toward the Corridor (that is, lighting of the roadway, signs, and overpasses). New light poles would be an additional human-made vertical intrusion in the landscape. However, ADOT has a policy to limit light spillover from its projects; this would be true for the proposed action as well. New sources of nighttime light in the study area would also include vehicles traveling through the Corridor.

The BLM parcels that are valued as Class III are in Segments 3 and 4, and are 1 mile or greater distance from the Corridor. The Class III parcels nearest the Corridor are along the Gila River in Segment 2, and adjacent to Picacho Reservoir in Segment 4. BLM's Class IV parcels in the study area are located in Segments 1, 2, and 3, some near an action corridor alternative, and others crossed by an alternative. Because Class IV is the least restrictive of the BLM classes, the class rating should not need to be

changed. Because the Class III parcels would not be directly affected by the action corridor alternatives, their ratings also should not need to be changed.

All action corridor alternatives would result in temporary visual impacts from construction activities such as temporary vegetation removal, disturbed soil, construction equipment, and construction equipment operation. These temporary disruptions and activities would be typical of any major roadway improvement project and are not considered substantial.

All action corridor alternatives have the potential to alter the study area's visual character through the removal of existing elements of the built environment. Although the exact nature of impacts related to the built environment would vary, all action corridor alternatives could affect established resources such as neighborhoods, schools, religious institutions, and businesses (see Section 3.3, *Social Conditions*) and result in acquisitions and displacements (see Section 3.2, *Land Use*); however, acquisitions and displacements cannot be determined until a specific alignment is identified.

Potential Impacts by Segment

As noted previously, static viewsheds, such as for residents, would depend on the nearness of the viewer to the proposed action, while dynamic viewsheds, such as for travelers, would depend on the location of the viewer along the proposed action and the corresponding view of the surrounding landscape from that location. Views would also vary by action corridor alternative, depending on whether the viewshed includes an at-grade freeway main line, depressed freeway main line, or elevated features, such as an overpass or system traffic interchange, as described previously, or an elevated railroad or canal crossing. Table 3.9-4 summarizes locations where elevated features may be included if the proposed action is not a depressed freeway. As shown in Table 3.9-4, all action corridor alternatives have the potential to introduce new features to the study area. Table 3.9-4 is followed by a discussion of the potential impacts by landscape unit.

Table 3.9-4. Potential locations of features in the study area[a]

Action corridor alternative	Potential location of feature
Segment 1	
E1a	• system traffic interchanges at U.S. Route 60, U.S. Route 60 bypass, State Route 24 • service traffic interchanges at Elliot Road, Ocotillo Road, Riggs/Combs Road, Skyline Drive, Bella Vista Road • crossing at Magma Arizona Railroad • crossing at Central Arizona Project Canal
E1b	• system traffic interchanges at U.S. Route 60, U.S. Route 60 bypass, State Route 24 • service traffic interchanges at Elliot Road, Riggs/Combs Road, Skyline Drive, Bella Vista Road • crossing at Magma Arizona Railroad • crossing at Central Arizona Project Canal
W1a	• system traffic interchange at U.S. Route 60 • service traffic interchanges at Riggs/Combs Road, Skyline Drive, Bella Vista Road • crossing at Magma Arizona Railroad • crossing at Central Arizona Project Canal
W1b	• system traffic interchanges at U.S. Route 60 and U.S. Route 60 bypass • service traffic interchanges at Elliot Road, Riggs/Combs Road, Skyline Drive, Bella Vista Road • crossing at Magma Arizona Railroad • crossing at Central Arizona Project Canal

Table 3.9-4. Potential locations of features in the study area[a]

Action corridor alternative	Potential location of feature
Segment 2	
E2a, E2b	• service traffic interchange at Arizona Farms Road
W2a, W2b	• service traffic interchange at Arizona Farms Road • crossing at Copper Basin Railway
Segment 3	
E3a, E3b, E3c, E3d	• service traffic interchanges at Hunt Highway, State Route 287, Martin Road, Bartlett Road, Kleck Road • crossing at Copper Basin Railway
W3	• service traffic interchanges at Hunt Highway, State Route 287, Martin Road, Bartlett Road, Kleck Road • crossing at Union Pacific Railroad
Segment 4	
E4, W4	• service traffic interchanges at Steele Road, Selma Highway, Hanna Road, Houser Road • crossing at Union Pacific Railroad • system traffic interchange at Interstate 10

[a] potential locations of features if the freeway is not depressed

UNIT 1

Visual resource change in Unit 1 would result from the visual character shifting from predominantly desert, with some agriculture and residential, to predominantly desert bisected by an element with urban-based form, line, and color. A linear and concrete form, in colors of black and concrete gray, would be a visual change from the natural, organic character of the desert, with its shades of tan and olive green. The freeway's presence would be "evident." However, because of the flat terrain, the visual intrusion would be most evident to those within about 0.5 mile of the freeway, if the freeway is not depressed. Unit 1 contains the system traffic interchange between the Corridor and SR 24. If this system traffic interchange is above grade, either a Western or Eastern Alternative would cause similar view obstructions.

Visual resource change in Unit 1 would also result from the proposed action's degradation or slight degradation of the overall "moderate" visual quality of views toward the facility, because a human-made highway structure is not harmonious with a natural/rural landscape. In particular, residents living closest to the proposed interchanges would have their distant views blocked or reduced, depending on proximity to the structure. Traveling viewers would still see desert and agricultural areas and, atop overpasses, if included, would have improved views of the surrounding background mountains.

Viewer response in Unit 1 was analyzed based on the overall moderate viewer sensitivity and exposure. Viewer sensitivity is classified as "moderate" since change to the existing visual setting is anticipated to be moderate, with some viewers having high sensitivity and some low sensitivity. Most existing viewers in the area are residents who would have constant exposure to the proposed facility, and residents tend to have a high sensitivity to change. Traveling viewers, who now use existing roads to make their way north or south, would have a low sensitivity to change. Their views would be essentially the same but with lower duration of exposure because they would travel more quickly and continuously north or south.

Viewer exposure is “moderate” in Unit 1. The number of viewers is relatively low, their location ranges from close (less than 0.25 mile) to far away (2+ miles), and duration would be either continuous for those living nearby or short for those driving through.

UNIT 2

Visual resource change in Unit 2 would result from the visual character shifting from predominantly agriculture/rural, with some residential, to predominantly agriculture bisected by an element with urban-based form, line, and color. A linear and concrete form, in colors of black and concrete gray, would be a visual change from the green shades of agricultural production. The linear form of the proposed facility, however, would not vary greatly from the already existing grid of agricultural roads.

Visual resource change in Unit 2 would also result from the proposed action’s degradation or slight degradation of the visual quality of views toward the facility, because a human-made highway structure is not harmonious with an agricultural/rural landscape. In particular, residents living closest to the proposed interchanges would have their distant views blocked or reduced, depending on closeness to the structure, if the freeway is not depressed. Traveling viewers on any of the action corridor alternatives would still see agricultural areas and, atop overpasses, if included, would have improved views of the surrounding background mountains.

Viewer response in Unit 2 was analyzed based on the overall moderate viewer sensitivity and exposure. Viewer sensitivity is classified as “moderate” since change to the existing visual setting is anticipated to be moderate, with some viewers having high sensitivity and some low sensitivity. Most existing viewers in the area are residents who would have constant exposure to the proposed facility, and residents tend to have a high sensitivity to change. Traveling viewers, who now use existing roads to make their way north or south, would have a low sensitivity to change. Their views would be essentially the same but with lower duration of exposure as they travel more quickly and continuously north or south.

Viewer exposure is “moderate” in Unit 2. The number of viewers is relatively low, their location ranges from close (less than 0.25 mile) to far away (2+ miles), and duration would be either continuous for those living nearby or short for those driving through.

Summary of Impacts

Based on the analyses in the previous sections, Table 3.9-5 summarizes the combined visual resource change and viewer response to characterize the potential overall visual impact of the proposed action in the study area. The proposed action would degrade or slightly degrade the overall “moderate” visual quality of views toward the facility, if overpasses are used, or would be neutral if the freeway is depressed. However, viewer sensitivity and the resulting visual impacts may be higher in areas that are generally recognized as sensitive, such as residential areas. Sensitive areas may also include areas with recreational, historic, or culturally important resources, which are described in Section 3.5, *Parkland and Recreational Facilities*, and in Section 3.14, *Cultural Resources*. The resulting potential impact would vary by location, depending on the characteristics of the built, cultural, and project environments, but would generally range from neutral to adverse.

Table 3.9-5. Summary of potential impacts

Landscape unit	Resource change		Viewer response		Potential impact
	Visual character	Visual quality	Viewer sensitivity	Viewer exposure	
Unit 1	Desert with urban influence	Moderate	Moderate	Moderate	Neutral to adverse
Unit 2	Agriculture with urban influence	Moderate	Moderate	Moderate	Neutral to adverse

3.9.5 Potential Avoidance, Minimization, and Mitigation Strategies

ADOT would use conventional practices to blend the proposed freeway's features into the existing setting in all segments. These conventional practices would apply equally to all action corridor alternatives and may include:

- Depress the freeway to eliminate visual intrusion in sensitive areas.
- Eliminate highway lighting when not required or if it causes superfluous light pollution.
- Minimize the height of facilities to the extent possible to reduce their visibility.
- Install screening walls to screen views of the freeway.
- Design walls to blend into the character of the community through careful selection of colors, materials, and textures.
- Use plants to provide screening for sensitive visual resources and viewers.
- Design new lighting to direct light to focus where it is needed, minimize light intruding onto adjacent properties, and reduce light pollution of the night sky.
- Minimize cut and fill areas by blending them with the surrounding environment.
- Use grading designs that create natural-looking slopes, surfaces, and transitions.
- Include landscape treatments that blend stormwater channels and basins into their surroundings and create new visual resources in the landscape.

Appendix D, *Summary of Avoidance, Minimization, and Mitigation Strategies*, contains a consolidated list of strategies to address environmental impacts.

3.9.6 Subsequent Tier 2 Analysis

No visual resource issues have been identified that would preclude constructing the proposed action in any of the action corridor alternatives. However, visual resource conditions could require more detailed consideration in the Tier 2 phase and in final design, where the context-sensitive solutions process would be considered for visual resources. FHWA defines context-sensitive solutions as "… a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility."

The Tier 2 phase could also include preparing landscape conceptual design plans. Subsequent analysis related to visual resources for the Tier 2 environmental evaluation may involve additional field review and photographic documentation. Following the field review and photographic documentation effort, additional visual assessment units may be determined, or key views within each visual assessment unit selected. If desired, key views would be selected to cover a range of views to and from the proposed freeway and to collectively represent the overall landscape of each unit. By assessing the area's visual resources, subsequent studies will gain an essential understanding of the landscape and community that is needed to then discuss and apply appropriate context-sensitive solutions.

3.9.6.1 Conclusion

Implementing any of the action corridor alternatives would result in impacts on the visual environment that range from neutral to adverse. The differences among the action corridor alternatives would be minor and would be typical of impacts experienced when new transportation facilities are introduced. The proposed action would degrade or slightly degrade the overall "moderate" visual quality of views toward the facility, if overpasses are used, or be neutral if the freeway is depressed. However, viewer sensitivity and the resulting visual impacts may be higher in sensitive areas, such as residential areas and areas with recreational, historical, or culturally important resources. Impacts would be mitigated through ADOT's conventional practice of blending freeway features into the character of the community.