



Final Tier 1 Environmental Impact Statement and Preliminary Section 4(f) Evaluation

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**Interstate 11
Final Tier 1 Environmental Impact Statement
and Preliminary Section 4(f) Evaluation**

Project No. M5180 01P / Federal Aid No. 999-M(161)S

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By the

**FEDERAL HIGHWAY ADMINISTRATION *and*
ARIZONA DEPARTMENT OF TRANSPORTATION**

With

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US ENVIRONMENTAL PROTECTION AGENCY
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US FISH AND WILDLIFE SERVICE
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US FOREST SERVICE, CORONADO NATIONAL FOREST
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Abstract

This Final Tier 1 Environmental Impact Statement and Preliminary Section 4(f) Evaluation (Final Tier 1 EIS) evaluates alternatives for the Interstate 11 (I-11) Corridor in Santa Cruz, Pima, Pinal, Maricopa, and Yavapai Counties, Arizona. The purpose of I-11 is to provide a high-priority, high-capacity, access-controlled transportation corridor to serve population and employment growth; support regional mobility; connect metropolitan areas and markets; enhance access to support economic vitality; and provide alternate regional routes to facilitate emergency evacuation and defense access.

This Final Tier 1 EIS is presented in a condensed format per Federal Highway Administration (FHWA) Technical Advisory T 6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*. The condensed format avoids duplication of content presented in the Draft Tier 1 EIS that remains unchanged or does not affect the NEPA decisions to be made.

The Draft Tier 1 EIS provided information for the public, agencies, and tribes to comment on the analysis of a set of Build Corridor Alternatives, including a Recommended Alternative. Each Build Corridor Alternative is a 2,000-foot-wide corridor, within which a future alignment would be located (Figure I-2). The assumed ultimate typical cross section for the I-11 facility is approximately 400 feet wide, but the specific alignment location and width would be refined as part of the Tier 2 analyses.

Based on the analysis presented in the Draft and Final Tier 1 EIS, and after consideration of public and stakeholder input received during the public comment period for the Draft EIS, FHWA and ADOT identified a Preferred Alternative in this Final Tier 1 EIS that is different than the Recommended Alternative in the Draft Tier 1 EIS. This Final Tier 1 EIS evaluates the Recommended Alternative from the Draft Tier 1 EIS, the Preferred Alternative, and the No Build Alternative to characterize the potential effects of each on the social, economic, and natural environments. The No Build Alternative represents the existing transportation system, with committed improvement projects that are programmed for funding.

The Preferred Alternative balances transportation needs with impacts to the natural and human environment and stakeholder input. The condensed format allows the reader to understand the rationale for changes between the Recommended Alternative and Preferred Alternative and the potential environmental impacts and avoidance and mitigation associated with the Preferred Alternative.

This Final Tier 1 EIS documents the NEPA study completed to date, culminating in the identification of the Preferred Alternative. This process included technical analysis, coordination with study partners such as Cooperating Agencies, Participating Agencies, and Tribal Governments, as well as the review and consideration of public input received at study milestones.

This Final Tier 1 EIS will be available for a 30-day review period for federal, state, and local agencies and private organizations, and members of the public who provided substantive comments on the Draft Tier 1 EIS (23 CFR 771.125(f)). FHWA and ADOT will sign a Record of Decision and post it on the project website no sooner than 30 days after publication of the Final Tier 1 EIS.



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Acronyms

AAC	Arizona Administrative Code
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
amsl	Above Mean Sea Level
ARS	Arizona Revised Statute
ASLD	Arizona State Land Department
ASTM	ASTM International
AWLWG	Arizona Wildlife Linkages Working Group
AZDA	Arizona Department of Agriculture
AZGS	Arizona Geological Survey
AZPDES	Arizona Pollutant Discharge Elimination System
AZTDM	Arizona Statewide Travel Demand Model
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe Railroad
BUILD	Better Utilizing Investments to Leverage Development
CAA	Clean Air Act
CAG	Central Arizona Governments
CAP	Central Arizona Project
CAVSARP	Central Area Valley Storage and Recovery Project
CAWCD	Central Arizona Water Conservation District
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Resource Conservation and Liability Act
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO ₂	Carbon Dioxide



CT	Census Tract
CWA	Clean Water Act
dBA	a-weighted decibel
DOI	US Department of the Interior
DOT	Department of Transportation
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAST Act	Fixing America's Surface Transportation Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FPPA	Farmland Protection Policy Act
FR	Federal Register
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FUDS	Formerly Used Defense Site
GIS	Geographic Information System
HDMS	Heritage Data Management System
I	Interstate
KOP	Key Observation Point
LE	Listed as Endangered under the ESA
LEDPA	Least Environmentally Damaging Practicable Alternative
LIB	Large Intact Block
LOS	Level of Service
LT	Listed as Threatened under the ESA
LU	Landscape Unit
LUST	Leaking Underground Storage Tank
LWCFA	Land and Water Conservation Fund Act
MAG	Maricopa Association of Government
MAP-21	Moving Ahead for Progress in the 21st Century Act
MBTA	Migratory Bird Treaty Act



mph	miles per hour
MPO	Metropolitan Planning Organization
MS4	Municipal Separate Stormwater Sewer System
MSAT	Mobile Source Air Toxic
N/A	Not Applicable
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAR	Noise Abatement Requirements
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O ₃	Ozone
°C	degrees Celsius
°F	degrees Fahrenheit
PAG	Pima Association of Governments
PEL	Planning and Environmental Linkage
PM	Particulate Matter
PM ₁₀	Particulate Matter less than ten microns
PM _{2.5}	Particulate Matter less than 2.5 microns
ppb	parts per billion
ppm	parts per million
Project Team	Federal Highway Administration, Arizona Department of Transportation, and their consultants
RCRA	Resource Conservation and Recovery Act
REMI	Regional Economic Models, Inc.
RMP	Resource Management Plan
RMZ	Recreation Management Zone



RTC	Regional Transportation Commission of Southern Nevada
RTP	Regional Transportation Plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SAVSARP	Southern Area Valley Storage and Recovery Project
SCMPO	Sun Corridor Metropolitan Planning Organization
SDWA	Safe Drinking Water Act
SEAGO	South Eastern Arizona Governments Organization
Section 106	Portion of the National Historic Preservation Act
Section 6(f)	Section of the 1965 Land and Water Conservation Fund Act
SERI	Species of Economic and Recreational Importance
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SPRR	Southern Pacific Railroad
SR	State Route
SRMA	Special Recreation Management Area
STIP	State Transportation Improvement Program
STRAHNET	Strategic Highway Network
Study Area	I-11 Corridor Study Area
SWAP	Arizona State Wildlife Action Plan 2012–2022
TIP	Transportation Improvement Plan
TNM	Traffic Noise Model
UPRR	Union Pacific Railroad
US	United States
US Institute	US Institute for Environmental Conflict Resolution
USACE	United States Corps of Engineers
USAF	United States Air Force
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service



USGS	United States Geological Survey
UST	Underground Storage Tank
VP	Viewpoint
VRM	Visual Resource Management
WQARF	Water Quality Assurance Revolving Fund



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1 EXECUTIVE SUMMARY

2 The Federal Highway Administration (FHWA) and the Arizona Department of Transportation
3 (ADOT) are conducting the environmental review process for the Interstate 11 (I-11) Corridor
4 from Nogales to Wickenburg, Arizona. This Final Tier 1 Environmental Impact Statement and
5 Preliminary Section 4(f) Evaluation (Final Tier 1 EIS) has been prepared as part of this process
6 in accordance with the National Environmental Policy Act (NEPA) and other regulatory
7 requirements. FHWA is the Federal Lead Agency and ADOT is the local project sponsor under
8 NEPA. As the federal lead agency, FHWA is responsible for compliance with NEPA and related
9 statutes.

10 ES.1 Project Background

11 The concept of a high-capacity, north-south interstate freeway facility connecting Canada and
12 Mexico through the western United States (US) has been considered for more than 20 years. It
13 was initially identified as the CANAMEX trade corridor in the 1991 Intermodal Surface
14 Transportation Efficiency Act, established under the North American Free Trade Agreement in
15 1993, and defined by the US Congress in the 1995 National Highway Systems Designation Act
16 (Public Law 104-59). CANAMEX was designated as High-Priority Corridor #26 in the National
17 Highway System, recognizing the importance of the corridor to the nation's economy, defense,
18 and mobility.

19 This NEPA process builds upon the prior I-11 and Intermountain West Corridor Study, a
20 multimodal planning effort completed in 2014 that involved ADOT, Nevada Department of
21 Transportation (NDOT), FHWA, Federal Railroad Administration, Maricopa Association of
22 Governments, Regional Transportation Commission of Southern Nevada, and other key
23 stakeholders. The I-11 and Intermountain West Corridor Study identified the I-11 Corridor as a
24 critical piece of multimodal infrastructure that would diversify, support, and connect the
25 economies of Arizona and Nevada.

26 In December 2015, the US Congress approved the Fixing America's Surface Transportation Act
27 (FAST Act), which is a 5-year legislation plan to improve the nation's surface transportation
28 infrastructure. The FAST Act formally designates I-11 as an interstate freeway throughout
29 Arizona, reinforcing ADOT's overall concept for I-11 that emerged from the I-11 and
30 Intermountain West Corridor Study (NDOT and ADOT 2014). This Final Tier 1 EIS is the next
31 step in the continuum of project development activities for the I-11 Corridor between Nogales
32 and Wickenburg.

33 ES.2 Scope of Final Tier 1 EIS

34 This Final Tier 1 EIS evaluates alternatives for the I-11 Corridor for approximately 280 miles
35 between Nogales and Wickenburg in Santa Cruz, Pima, Pinal, Maricopa, and Yavapai Counties,
36 Arizona. The Tier 1 EIS process is an effective method for managing the NEPA process across
37 a large geographic area such as the I-11 Corridor Study Area (Study Area).



1 The Draft Tier 1 EIS provided information for the public, agencies, and tribes to comment on the
2 analysis of a set of Build Corridor Alternatives and a No Build Alternative, and identified a
3 Recommended Alternative. FHWA is following a tiered environmental process.

4 This Final Tier 1 EIS is presented in a condensed format per FHWA Technical Advisory
5 T 6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*
6 (1987). The condensed format avoids duplication of content presented in the Draft Tier 1 EIS
7 that remains unchanged or does not affect the NEPA decisions to be made.

8 As I-11 is intended to extend from Mexico to Canada, highway, rail, and utilities may be located
9 in the same corridor. The analysis in this Final Tier 1 EIS does not preclude rail or utility co-
10 location if this infrastructure is implemented in the future. The planning for any future rail or
11 utility infrastructure co-located with I-11 would need to include a separate environmental review
12 process.

13 **ES.3 Need for the Proposed Facility**

14 The assessment of needs associated with I-11 from Nogales to Wickenburg builds upon the I-11
15 and Intermountain West Corridor Study and its accompanying Planning and Environmental
16 Linkages document (NDOT and ADOT 2014). Key transportation-related problems and issues in
17 the Study Area were identified based on a combination of previous studies and input from
18 agency coordination and public involvement during the I-11 Corridor Study scoping process.
19 The problems, issues, and opportunities identified in the Study Area include:

- 20 • **Population and employment growth:** High-growth areas need access to the high-capacity,
21 access-controlled transportation network.
- 22 • **Traffic growth and travel time reliability:** Increased traffic growth reduces travel time
23 reliability due to unpredictable freeway conditions that impede travel flows and hinder the
24 ability to move people and goods around and between metropolitan areas efficiently.
- 25 • **System linkages and regional mobility:** The lack of a north-south interstate freeway link in
26 the Intermountain West constrains trade, reduces access for economic development, and
27 inhibits efficient mobility.
- 28 • **Access to economic activity centers:** Efficient freeway access and connectivity to major
29 economic activity centers are required for operations in a competitive economic market.
- 30 • **Homeland security and national defense:** Alternate interstate freeway routes and regional
31 route redundancy help alleviate congestion and prevent bottlenecks during emergency
32 situations. These routes may be parallel or may generally serve the same major origin and
33 destination points, with local or regional roads connecting the freeways.

34 **ES.4 Purpose of the Proposed Facility**

35 Given the need for greater connectivity and travel time reliability as population and employment
36 continue to increase in the Study Area, the purpose of the I-11 corridor is to:



- 1 • Provide a high-priority, high-capacity, access-controlled transportation corridor to serve
2 population and employment growth.
- 3 • Support improved regional mobility for people and goods to reduce congestion and improve
4 travel efficiency.
- 5 • Connect metropolitan areas and markets in the Intermountain West to Mexico and Canada
6 through a continuous high-capacity transportation corridor.
- 7 • Enhance access to the high-capacity transportation network to support economic vitality.
- 8 • Provide for regional route redundancy to facilitate efficient mobility for emergency
9 evacuation and defense access.

10 **ES.5 Alternatives Considered**

11 The Tier 1 EIS alternatives development process narrowed down a large initial range of
12 suggested options to a smaller reasonable range to carry forward for detailed evaluation in the
13 Draft Tier 1 EIS. The Project Team, comprised of FHWA, ADOT, and their consultant team, first
14 developed a range of corridor options (or segments) within the Study Area and lettered them
15 from A to W. The corridor options were based on prior plans and studies, agency scoping input,
16 public input, tribal coordination, and technical analysis. The Project Team eliminated options
17 that did not perform as well as others in the same area and then combined remaining options to
18 form three end-to-end Build Corridor Alternatives (Purple, Green, and Orange).

19 **ES.5.1 Purple, Green, Orange, and Recommended End-to-End Alternatives**

20 The Draft Tier 1 EIS compared the Purple, Green, and Orange Alternatives and the No Build
21 Alternative. The end-to-end Build Corridor Alternatives (Purple, Green, and Orange) represent
22 the range of viewpoints gathered from stakeholders, agencies, tribes, and the public during the
23 NEPA scoping process. The Orange Alternative consists mostly of existing interstate and
24 highway corridors. The Green Alternative is primarily new corridors not co-located with existing
25 highways, and the Purple Alternative is a mix of existing and new corridors. The Draft Tier 1 EIS
26 recommended a hybrid alternative that used pieces of each end-to-end Build Corridor
27 Alternative, referred to as the Recommended Alternative.

28 Each of the Build Corridor Alternatives is a 2,000-foot-wide corridor within which a future Tier 2
29 study would place the specific alignment of I-11 and design, assumed to be approximately
30 400 feet wide. If a Build Corridor Alternative is selected in the Tier 1 EIS Record of Decision, it
31 will be studied further in future Tier 2 NEPA analyses and constructed in phases. The 2,000-
32 foot-wide corridor studied in the Tier 1 EIS provides flexibility for future studies to also consider
33 co-location of rail or utilities.

34 **ES.5.2 No Build Alternative**

35 The No Build Alternative is the baseline for comparison to the Build Corridor Alternatives and is
36 evaluated as a full alternative in the Draft Tier 1 EIS. The No Build Alternative consists of the
37 existing transportation system as well as committed transportation projects that are



1 programmed for funding in ADOT's 2018-2022 Five-Year Transportation Facilities Construction
2 Program (ADOT 2017a).

3 **ES.5.3 Preferred Alternative**

4 FHWA and ADOT have identified a Preferred Alternative in this Final Tier 1 EIS that is different
5 from the Recommended Alternative in the Draft Tier 1 EIS. The Preferred Alternative is shown
6 on **Figure ES-1**. The Recommended Alternative is shown on **Figure ES-2**. **Chapter 6** describes
7 the Preferred Alternative and the rationale for its selection.

8 **ES.6 Comparison of Recommended and Preferred Alternatives**

9 The Final Tier 1 EIS documents the NEPA study completed to date, culminating in the
10 identification of the Preferred Alternative. This process included technical analysis, coordination
11 with study partners such as Cooperating Agencies, Participating Agencies, and Tribal
12 Governments, as well as the review and consideration of public input received at study
13 milestones.

14 The Project Team evaluated the comments received on the Recommended Alternative
15 presented in the Draft Tier 1 EIS. Based on this evaluation, FHWA and ADOT are proceeding
16 with a Preferred Alternative in this Final Tier 1 EIS that is different from the Recommended
17 Alternative in the Draft Tier 1 EIS. The Final Tier 1 EIS compares the Recommended
18 Alternative, the Preferred Alternative, and the No Build Alternative to characterize the potential
19 effects of each on the social, economic, and natural environments. The Preferred Alternative
20 balances transportation needs with impacts to the natural and human environment and
21 stakeholder input.

22 **ES.6.1 Summary of Alignment Differences between the Recommended and** 23 **Preferred Alternatives**

24 Changes between the Recommended and Preferred Alternative were based on feedback on the
25 Draft Tier 1 EIS and the additional technical analyses documented in **Chapter 3** (Affected
26 Environment and Environmental Consequences) and **Chapter 4** (Draft Preliminary Section 4(f)
27 Evaluation) of this Final Tier 1 EIS. The Preferred Alternative follows more existing highways
28 than the Recommended Alternative and includes segments co-located with I-19, I-8, SR 85,
29 I-10, and US 93. It also includes many of the new corridor segments from the Recommended
30 Alternative while incorporating several refinements to avoid and minimize potential impacts, as
31 described below:

- 32 • The Preferred Alternative carries forward both the west option in Pima County
33 (Recommended or Green Alternative) and the east option in Pima County (Orange
34 Alternative), allowing ADOT to make a more informed decision after completing detailed
35 environmental and engineering studies in Tier 2.
- 36 • The Preferred Alternative connects to I-10 at Park Link Drive north of Marana rather than
37 Tortolita Boulevard, which is responsive to feedback from the Town of Marana.

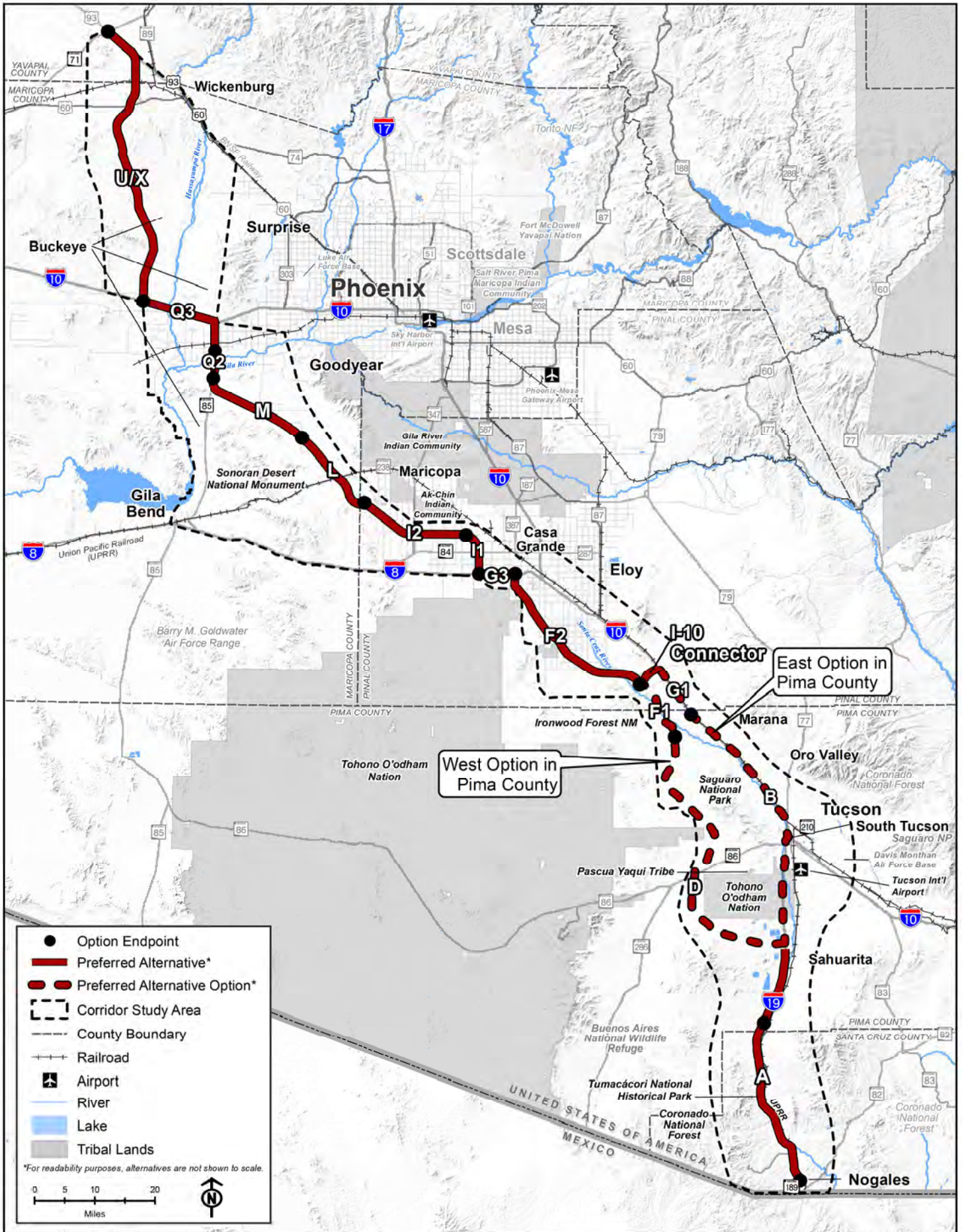


Figure ES-1. Preferred Alternative

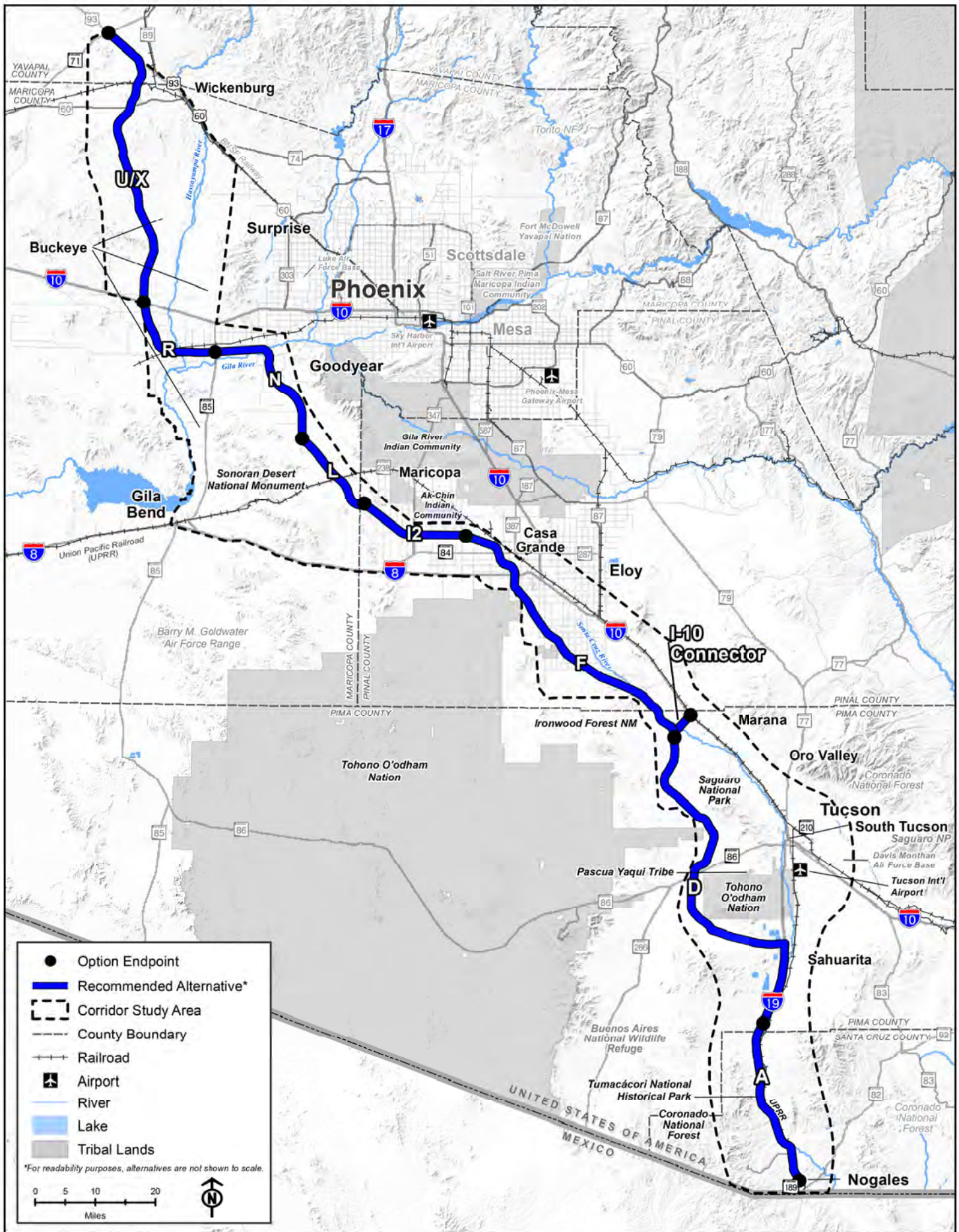


Figure ES-2. Recommended Alternative in the Draft Tier 1 EIS



- 1 • The Preferred Alternative incorporates a refinement in southern Pinal County to minimize
2 impacts to the Santa Cruz River in response to comments from the US Army Corps of
3 Engineers (USACE).
- 4 • The Preferred Alternative follows Montgomery Road north of I-8, which is consistent with
5 adopted plans and local agency feedback.
- 6 • The Preferred Alternative uses SR 85 and I-10 in the Buckeye area, eliminating new
7 crossings of the Gila River and Hassayampa River and minimizing impacts to critical riparian
8 habitat and federally protected species.
- 9 • The Preferred Alternative was shifted slightly west near US 93 in Yavapai County to
10 minimize impacts to residences, floodplains, wildlife linkages, and Sonoran Desert tortoise
11 habitat.

12 **Table ES-1** compares major geometric characteristics of the Recommended Alternative and
13 Preferred Alternative.

14 **Table ES-1. Characteristics of Recommended and Preferred Alternatives**

Characteristic	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Total Length (miles)	276.1	276.0	267.8
New Lane Miles	917	864	714

15 **ES.6.2 Purpose and Need Comparison**

16 **Table ES-2** compares the Recommended and Preferred Alternatives against Purpose and Need
17 metrics.

18 **Table ES-2. Considerations in Meeting the I-11 Purpose and Need: Recommended**
19 **and Preferred Alternatives**

Purpose and Need Metric	No Build Alternative	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Population and Employment Growth				
Provides Access to Planned Growth Areas ^a	Does not serve highest growth area (western	Best serves areas of greatest population and employment growth in the Study Area in Pinal and	Best serves Casa Grande and Wickenburg growth areas Serves growth in Buckeye well, but does not provide as much access to the Goodyear/ SR 303L area as the Recommended Alternative	



Purpose and Need Metric	No Build Alternative	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
	Maricopa County), within the Study Area	western Maricopa Counties (Casa Grande, Goodyear, Buckeye, and Wickenburg)	Serves planned growth area near Ryan Airfield	Best serves continued population and employment growth centered along existing I-10 and I-19 (Sahuarita, Tucson, Marana)
Traffic Growth and Travel Time Reliability				
Reduces Travel Time for Long-Distance Traffic (2040 northbound travel time from Nogales to Wickenburg) ^b	297 minutes	234 minutes	236 minutes	250 minutes
Achieves Level of Service (LOS) C or better in rural areas, LOS D or better in urban areas on I-11 ^b	LOS F on existing roads in some areas	LOS C or better on I-11	LOS C or better on I-11	LOS C in rural areas outside of Tucson LOS D on I-11 in urban areas (Tucson)
System Linkages and Regional Mobility				
Effectively attracts/diverts traffic from existing roadways, as measured by:				
Percent increase in vehicle miles traveled (VMT)	No diversion of passenger vehicles or trucks	6 percent increase in passenger car and truck VMT	5 percent increase in passenger car and truck VMT	6 percent increase in passenger car and truck VMT
Percent increase in truck VMT		23 percent increase in truck VMT	21 percent increase in truck VMT	23 percent increase in truck VMT
Access to Economic Activity Centers				
Serves Key Economic Centers ^c	Serves 8 existing economic centers	Serves 16 economic centers, 8 existing and 8 emerging	Serves 15 economic centers, 6 existing and 9 emerging	Serves 17 economic centers, 8 existing and 9 emerging



Purpose and Need Metric	No Build Alternative	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Homeland Security and National Defense				
Provides an Alternate Regional Route ^d	No	Yes, for 247.4 miles of the total 276.1-mile-long alternative	Yes, for 219.5 miles of the total 276.0-mile-long alternative	Yes, for 143.1 miles of the total 267.8-mile-long alternative

- 1 ^a Planned growth areas included in this metric are shown as areas of growth on **Figure 1-4**.
- 2 ^b Measured in the afternoon peak period.
- 3 ^c Key economic centers are shown as existing and emerging employment clusters on **Figure 1-4**.
- 4 ^d Alternate regional route was reported by segment (lettered option) in the Draft Tier 1 EIS. The Final Tier 1 EIS reports this metric
- 5 by miles because segmentation has changed, and mileage provides a consistent measurement across all alternatives.

6 ES.6.3 Comparison of Impacted Resources

7 **Table ES-3** compares impacts for the Recommended and Preferred Alternatives where they are
 8 quantified in **Chapter 3** (Affected Environment and Environmental Consequences) and **Chapter**
 9 **4** (Draft Preliminary Section 4(f) Evaluation). There were no quantified differences for **Section**
 10 **3.11** (Hazardous Materials); **Section 3.12** (Geology, Soils, and Prime and Unique Farmlands);
 11 **Section 3.15** (Temporary and Construction-Related Impacts); and **Section 3.16** (Irreversible
 12 and Irretrievable Commitment of Resources); impacts are similar for these resources.

13 Under all Build Corridor Alternatives, construction of new transportation facilities could indirectly
 14 affect the type or pace of land use changes through the introduction of new access and more
 15 efficient travel corridors to undeveloped areas. Additionally, the Build Corridor Alternatives
 16 would add to the cumulative efficiency and mobility benefits provided by the transportation
 17 system through the diversion of traffic, improved travel times, lower congestion levels, improved
 18 safety, and more direct routes. Indirect and cumulative impacts for all alternatives from potential
 19 future actions are discussed further in **Section 3.17** (Indirect and Cumulative Effects).

20 **Table ES-3. Comparison of Impacts on Resources within the 2,000-foot-wide**
 21 **Corridors of the Recommended and Preferred Alternatives**

Resource	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Land Use (Section 3.3)			
BLM Land (acres)	6,415	10,861	10,323
Private Land (acres)	40,939	38,596	39,999
State Trust Land (acres)	12,629	17,241	12,487
Community Resources, Title VI, and Environmental Justice (Section 3.5)			
Project Area within Minority or Low-Income Communities (acres)	29,257	15,786	18,790



Resource	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Project Area within Minority or Low-Income Communities (% of total Project Area acres)	39%	24%	29%
Economic Impacts (Section 3.6)			
Gross Regional Product (\$ Billions)	\$12.2	\$11.7	\$9.6
Personal Income (\$ Billions)	\$10.3	\$10.1	\$8.5
Employment (Thousands of Job-Years)	136.2	130.2	106.7
Archaeological, Historical, Architectural, and Cultural Resources (Section 3.7)			
Percent covered by previous cultural resource surveys (% of total Project Area acres)	23%	28%	39%
Total recorded archaeological sites and historic structures within surveyed areas (number)	215	246	420
Estimated potentially NRHP-eligible archaeological sites and historic structures affected (number)	100	110	70
Total NRHP-listed or determined eligible historic districts and buildings affected (number)	0	0	4
Estimated unrecorded potentially NRHP-eligible historic districts and buildings affected (number)	4	3	5
Traditional Cultural Properties Potentially Directly Affected (number)	2	2	2
Visual and Aesthetics (Section 3.9)			
BLM Visual Resource Management Class I (acres)	0	0	0
BLM Visual Resource Management Class II (acres)	0	0	0
BLM Visual Resource Management Class III (acres)	2,988	3,097	2,568
BLM Visual Resource Management Class IV (acres)	3,495	7,583	7,583
Water Resources (Section 3.13)			
Within Active Management Areas for Groundwater (miles)	258	270	247
Within Sole Source Aquifers (miles)	106	119	98
Groundwater Wells (number)	887	636	1,183
Impaired Waters in Proximity (miles)	35	32	41



Resource	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Potential Waters of the US (miles)	306	323	312
National Wetland Inventory and Key Potential Wetlands (acres / number)	187 / 5	282 / 3	286 / 5
FEMA Floodplains (acres)	15,817	13,261	10,809
Biological Resources (Section 3.14)			
Riparian Areas (acres)	1,209	694	590
Important Bird Areas (acres)	1,464	1,133	572
Fragments Lost from Existing Large Intact Blocks (acres)	13,072	8,368	3,550
Section 4(f) Properties (Chapter 4)			
Potential Use of Section 4(f) Properties (number)	2	2	8

1 **ES.7 Coordination and Outreach**

2 FHWA and ADOT have undertaken continuous outreach efforts throughout the scoping process,
3 alternatives development, and preparation of the Draft Tier 1 EIS. Further detail and information
4 on the outreach described below can be found in **Chapter 5** (Coordination and Outreach) and
5 **Appendix G** (Public Involvement Materials) of the Draft Tier 1 EIS.

6 **ES.7.1 Coordination and Outreach for Draft Tier 1 EIS**

7 Major outreach opportunities prior to publication of the Draft Tier 1 EIS included pre-scoping,
8 scoping, agency/public information meetings, and recurring agency coordination meetings.

9 FHWA and ADOT requested local and federal agencies and tribal governments to participate in
10 the environmental review process by inviting them to be a Cooperating Agency or a
11 Participating Agency under NEPA guidelines. In addition, agencies and others were invited to
12 participate as consulting parties under Section 106 of the National Historic Preservation Act
13 (see **Section 3.7** [Archaeological, Historical, Architectural, and Cultural Resources]). There are
14 a total of 10 Cooperating Agencies and 51 Participating Agencies. Their roles and
15 responsibilities have included early and regular participation in the NEPA process and providing
16 comments and guidance on draft documents, including the Administrative Draft Tier 1 EIS.
17 Cooperating Agencies have continued to meet monthly throughout the NEPA process.

18 Tribes were invited to attend agency and stakeholder meetings at each major milestone
19 throughout the study process (2016 scoping activities and 2017 agency and public information
20 meetings). The Ak-Chin Indian Community, Gila River Indian Community, Pascua Yaqui Tribe,
21 and Tohono O’odham Nation were engaged throughout the study process. A series of smaller
22 meetings occurred with the Ak-Chin Indian Community, Gila River Indian Community, Salt River
23 Pima-Maricopa Indian Community, Tohono O’odham Nation, Pascua Yaqui Tribe, and other
24 tribal governments that requested individual meetings.



1 A 45-day scoping period held from May 23 to July 8, 2016, was initiated by the publication of the
2 Notice of Intent to Prepare a Tier 1 EIS in the Federal Register in May 2016 (81 FR 32007). The
3 input FHWA and ADOT received during scoping helped identify the opportunities and
4 constraints in the Study Area, the range of alternatives to be studied, and approach and
5 methodology for the environmental analysis.

6 **ES.7.2 Draft Tier 1 EIS Outreach and Public Review Period**

7 On April 5, 2019, FHWA published a notice of availability for the Draft Tier 1 EIS (84 FR 13662).
8 An Errata to the Draft Tier 1 EIS was prepared to include a section of the document missing
9 from the April 5, 2019, publication; it was made available for review on the project website on
10 April 25, 2019, and the comment period was extended through July 8, 2019 (84 FR 18634).
11 During the public review period, FHWA and ADOT conducted agency outreach and a public
12 hearing process to provide opportunities for comment. Six public hearings were held throughout
13 the Study Area and are listed in **Table 5-3. Appendix G** (Public Involvement Summary Report)
14 of this Final Tier 1 EIS provides more detailed information on the public hearings and the
15 outreach process for the public hearings.

16 The Project Team received 12,445 comment submissions through the official comment
17 channels during the official comment period. Refer to **Chapter 6** (Preferred Alternative) for a
18 summary of comments. All comments received during the April 5 to July 8, 2019, comment
19 period are addressed in **Appendix H** (Comments on Draft Tier I EIS and Responses) of this
20 Final Tier 1 EIS.

21 **ES.7.3 Coordination and Outreach Since Draft Tier 1 EIS**

22 Following the close of the Draft Tier 1 EIS public comment period on July 8, 2019, the Project
23 Team focused their efforts on reviewing and understanding comments and continued to meet
24 with agency partners. Agency outreach and coordination following the formal comment period
25 for the Draft Tier 1 EIS included one-on-one meetings with agency stakeholders so that ADOT
26 and FHWA could gain a better understanding of comments and potential solutions to address
27 concerns, as well as recurring cooperating agency, project management team, and executive
28 leadership team meetings.

29 **ES.8 Funding, Implementation, and Phasing**

30 Following the public review period for this Final Tier 1 EIS, FHWA and ADOT will publish a
31 Record of Decision that affirms a Selected Alternative. If FHWA and ADOT select a Build
32 Corridor Alternative in the Record of Decision, the build alternative would be implemented in
33 segments as funding is available. At this time, no funding has been identified to plan, design, or
34 construct any part of I-11, including any Tier 2 analysis. The implementation of the corridor
35 could entail federal, state, or local funding; tolling; or private-public partnerships. If the No Build
36 Alternative is selected, no I-11 project would occur.

37 ADOT may also phase Tier 2 projects according to the type of facility and extent of
38 improvements within a segment such as intersection or interchange improvements, additional
39 access controls, or construction of a two-lane, three-lane, or four-lane divided roadway that is
40 later upgraded to interstate standards.



- 1 ADOT will act as the lead agency on any future Tier 2 process for the I-11 project as FHWA and
- 2 ADOT entered a Memorandum of Understanding in April 2019 where ADOT was assigned
- 3 responsibility to conduct environmental reviews under NEPA.

- 4 Before initiating a Tier 2 project, ADOT would verify the termini, identify the scope, and
- 5 determine the specific class of NEPA analysis. The Tier 2 process would include NEPA analysis
- 6 to inform the selection of a specific alignment within the 2,000-foot-wide corridor, site-specific
- 7 environmental analyses, development of site-specific mitigation measures, and preliminary
- 8 design. The alignment is expected to be approximately 400 feet wide but will depend on site-
- 9 specific constraints and requirements. ADOT will continue to coordinate with tribes, public, and
- 10 agencies prior to and during Tier 2 project-level analysis.

- 11 See **Chapter 7** (Summary of Mitigation and Tier 2 Analysis) for a summary of specific Tier 2
- 12 studies and mitigation. Because this is a Tier 1 NEPA document, mitigation measures in the
- 13 Record of Decision represent commitments that will be implemented in I-11 Tier 2 projects.



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1 INTRODUCTION AND READER'S GUIDE

2 This section introduces and summarizes the overall methodology for the Final Tier 1 EIS. This
3 section replaces **Section 3.1** (Introduction) of the Draft Tier 1 EIS, which previously only
4 summarized the organization of, and Tier 1 analysis methodology for, **Chapter 3** (Affected
5 Environment and Environmental Consequences).

6 Condensed Final Tier 1 EIS

7 This Final Tier 1 EIS is presented in a condensed format per FHWA Technical Advisory
8 T 6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*
9 (1987). The Final Tier 1 EIS is a much shorter document than one prepared under a traditional
10 approach. The condensed format avoids duplication of content presented in the Draft Tier 1 EIS
11 that remains unchanged and does not affect the NEPA decisions to be made. This Final Tier 1
12 EIS does not republish all data and analyses at the same level of detail as the Draft Tier 1 EIS
13 and its technical appendices; rather, this Final Tier 1 EIS references corresponding sections of
14 the Draft Tier 1 EIS and presents noteworthy changes and updates since the publication of the
15 Draft Tier 1 EIS.

16 FHWA and ADOT decided to use the condensed
17 Final Tier 1 EIS format, in part, to streamline
18 complex information as requested by several
19 cooperating and participating agencies.

Read **Chapter 6** (Preferred Alternative) to learn about the Preferred Alternative identified by the Final Tier 1 EIS and how it compares to the Recommended Alternative that was presented in the Draft Tier 1 EIS.

20 The organization of this Final Tier 1 EIS focuses on
21 the comparison of the Recommended Alternative
22 from the Draft Tier 1 EIS and the Preferred Alternative, with only limited references to the
23 Purple, Green, and Orange Build Corridor Alternatives or lettered options (the smaller segments
24 A, B, C, etc.) where necessary to explain differences in impacts. The condensed format allows
25 the reader to understand the rationale for changes between the Recommended Alternative and
26 Preferred Alternative and the potential environmental impacts and avoidance and mitigation
27 associated with the Preferred Alternative.

28 Recommended Versus Preferred Build Corridor Alternatives

29 The Draft Tier 1 EIS analyzed three Build Corridor Alternatives – Purple, Green, and Orange –
30 in addition to the No Build Alternative. The Draft Tier 1 EIS did not identify a Preferred
31 Alternative as outlined in 23 CFR 771.123 but instead recommended an alternative for public
32 feedback (the Recommended Alternative). The Recommended Alternative was a hybrid of
33 mainly the Purple and Green Alternatives and was summarized in **Chapter 6** (Recommended
34 Alternative) of the Draft Tier 1 EIS.

35 This Final Tier 1 EIS identifies a Preferred Alternative that is different than the Recommended
36 Alternative, as shown on **Figure I-1. Chapter 6** (Preferred Alternative) describes why FHWA
37 and ADOT changed the Preferred Alternative from the Recommended Alternative.

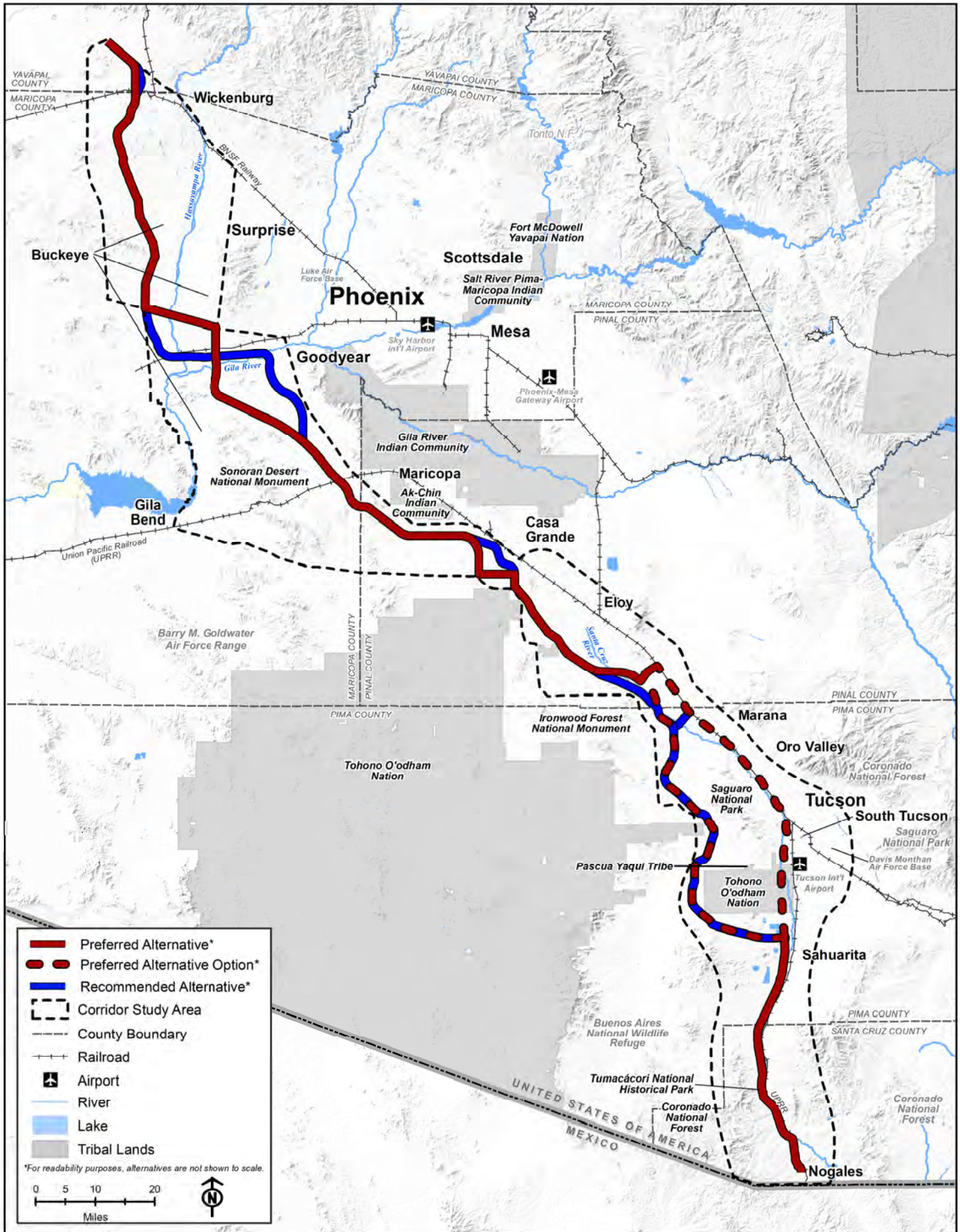


Figure I-1. Recommended and Preferred Alternatives



1 As shown on **Figure I-1**, FHWA and ADOT are carrying forward two options in Pima County.
2 The Draft Tier 1 EIS recommended the Green Alternative in Pima County. Feedback on the
3 Draft Tier 1 EIS requested more detailed environmental studies and engineering for the I-11
4 Corridor in this area. FHWA and ADOT considered these comments and modified the Preferred
5 Alternative to carry forward both the west option in Pima County (Recommended, or Green
6 Alternative) and east option in Pima County (Orange Alternative). Because no decision is being
7 made between the west option and the east option at this time, FHWA and ADOT did not
8 conduct additional analyses differentiating between these two options.

9 Final Tier 1 EIS Organization

10 This Final Tier 1 EIS is organized as follows:

Chapter 1, Purpose and Need	This chapter summarizes the purpose and need from the Draft Tier 1 EIS and discusses any changes since the Draft Tier 1 EIS was published.
Chapter 2, Alternatives Considered in Draft Tier 1 EIS	This chapter briefly summarizes the Purple, Green, and Orange Build Corridor Alternatives described in more detail in the Draft Tier 1 EIS. <i>This chapter only describes the three original Build Corridor Alternatives, which formed the building blocks of the Recommended (hybrid) and Preferred (hybrid) Alternatives. The Recommended and Preferred Alternatives are described in Chapter 6 (Preferred Alternative).</i>
Chapter 3, Affected Environment and Environmental Consequences	This chapter briefly summarizes the impacts of the Purple, Green, and Orange Alternatives, and compares the Recommended Alternative and Preferred Alternative by resource area. <i>This chapter does not repeat detailed information related to the Purple, Green, and Orange Alternatives but instead focuses on the Recommended and Preferred Alternatives, which are hybrids of the Purple, Green, and Orange Alternatives. Refer to the Draft Tier 1 EIS for details on the Purple, Green, and Orange Alternatives.</i> Sections of Chapter 3 (Affected Environment and Environmental Consequences) follow this format: <ul style="list-style-type: none">• Summary of Draft Tier 1 EIS• Summary of Changes Since Draft Tier 1 EIS• No Build Alternative• Recommended Alternative• Preferred Alternative• Mitigation and Tier 2 Analysis The length and complexity of changes to Section 3.13 (Water Resources) warrant republishing the entire section rather than following the condensed format. Indirect and cumulative impacts by resource are described in Section 3.17 (Indirect and Cumulative Effects).
Chapter 4, Draft Preliminary Section 4(f) Evaluation	The length and complexity of changes to this chapter warrant republishing the chapter rather than following the condensed format.



Chapter 5, Coordination and Outreach	This chapter summarizes outreach and coordination for the Draft Tier 1 EIS and includes details on outreach since the Draft Tier 1 EIS.
Chapter 6, Preferred Alternative	This chapter compares the No Build, Recommended, and Preferred Alternatives and provides the rationale for changes between the Recommended and Preferred Alternatives.
Chapter 7, Summary of Mitigation and Tier 2 Analysis	This chapter summarizes the mitigation measures and Tier 2 analysis commitments to facilitate compliance in Tier 2. The mitigation measures and Tier 2 analysis commitments are numbered for clarity and accountability.

1 Geographies

2 **Chapter 3** (Affected Environment and Environmental Consequences) of the Draft Tier 1 EIS
3 described the Build Corridor Alternatives in three sections: South, Central, and North. This Final
4 Tier 1 EIS describes changes between the Recommended and Preferred Alternatives where
5 needed in terms of five geographies as shown on **Figure I-1**.

- 6 • I-19: Nogales to Sahuarita (Santa Cruz and Pima Counties)
- 7 • Sahuarita to Marana (Pima County)
- 8 • Marana to Casa Grande (Pinal County)
- 9 • Casa Grande to Buckeye (Pinal and Maricopa Counties)
- 10 • Buckeye to Wickenburg (Maricopa and Yavapai Counties)

11 This Final Tier 1 EIS compares the Recommended and Preferred Alternatives on an end-to-end
12 basis and discusses key decision areas, where applicable. Comparison tables include the west
13 option in Pima County and east option in Pima County. The west option in Pima County
14 assumes the Central Arizona Project (CAP) design option, as described in **Chapter 6** (Preferred
15 Alternative).

16 Tier 1 Analysis

17 The Tier 1 analysis identifies and compares the potential impacts of the Build Corridor
18 Alternatives and the No Build Alternative, as described in **Chapter 2** (Alternatives Considered in
19 Draft Tier 1 EIS). The Build Corridor Alternatives have several common features.

- 20 • Each Build Corridor Alternative is a 2,000-foot-wide corridor within which a future alignment
21 would be located (**Figure I-2**). The assumed ultimate typical cross section for the I-11 facility
22 is approximately 400 feet wide, but the specific alignment location and width would be
23 refined as part of the Tier 2 analyses. The analysis applied in Tier 1 is sufficient to compare
24 corridor alternatives, and the Build Corridor Alternative selected in Tier 1 would provide
25 Tier 2 studies the flexibility to identify a specific alignment that responds to additional
26 information identified during the more detailed Tier 2 analysis.

- 1 • A typical cross section was developed to inform the comparative analysis of the Build
2 Corridor Alternatives. Future cross sections for a specific alignment may be refined in Tier 2
3 analyses. In locations where a corridor alternative would be co-located with an existing
4 transportation facility, it is assumed that the implementation of the I-11 Corridor would result
5 in capacity improvements as needed to meet Level of Service (LOS) C (in rural areas) or D
6 (in urban areas) for both I-11 and the co-located facility. Assumptions regarding cross
7 sections are provided in **Appendix E1** (Conceptual Drawings) of the Draft Tier 1 EIS.
8 Definitions of the levels of service are provided in **Chapter 1, Figure 1-6** of the Draft Tier 1
9 EIS.

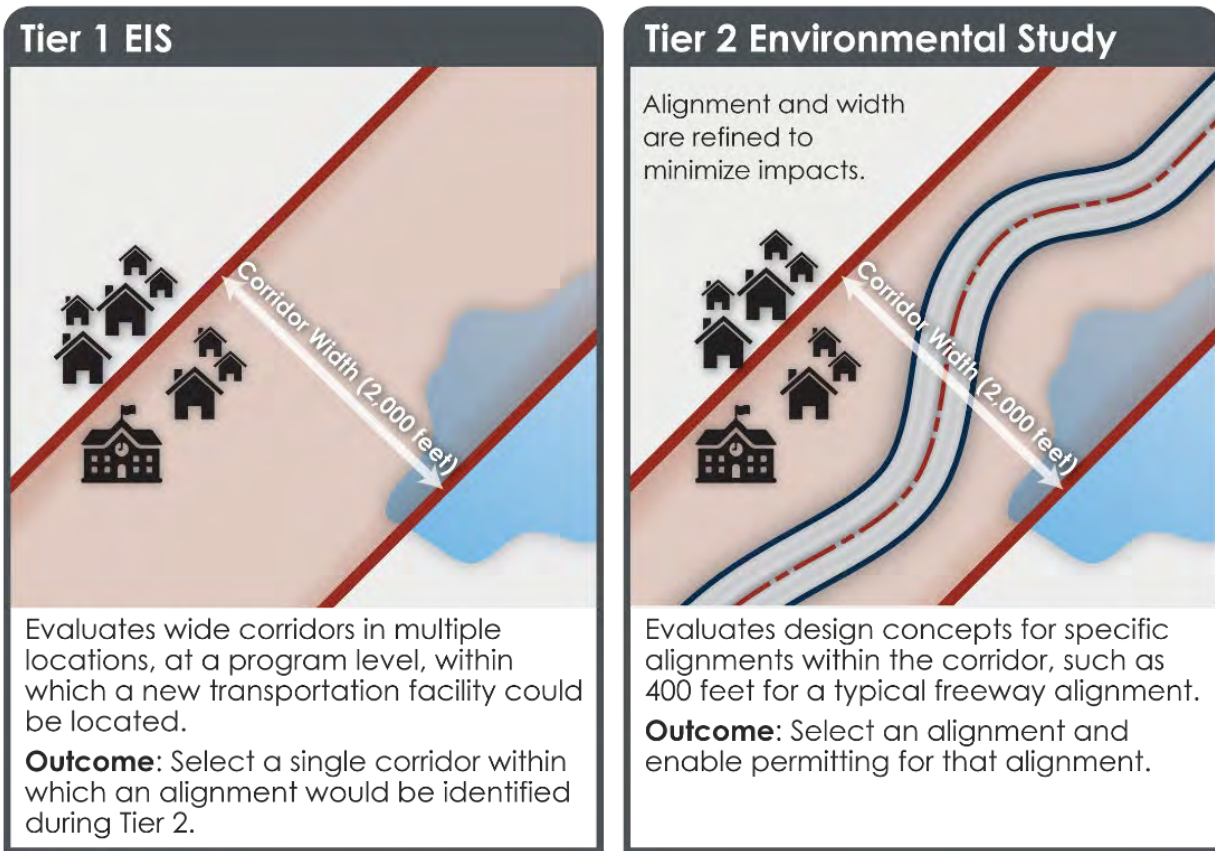


Figure I-2. Tier 1 versus Tier 2 Level of Detail

- 12 • Specific interchange locations are not identified for the Build Corridor Alternatives. However,
13 a set of potential interchange locations was assumed for purposes of the analysis based on
14 the most current available transportation network in the Arizona Statewide Travel Demand
15 Model (AZTDM). It is assumed that interchange locations would be accommodated within
16 the 2,000-foot-wide corridor.

17 The level of analysis for the Tier 1 EIS is qualitative and programmatic, reflecting the broad
18 definition of the corridor for the Tier 1 EIS. The analysis relies on readily available data, mapped
19 information from resource and regulatory agencies, previously completed environmental
20 studies, and aerial imagery. Some technical efforts for the Tier 1 EIS involved limited site visits
21 and field work in selected areas.



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1 **1 PURPOSE AND NEED**

2 **1.1 Summary of Draft Tier 1 EIS**

3 **1.1.1 Purpose of and Need for Proposed Facility**

4 The purpose of and need for the I-11 Corridor, as well as metrics developed by the Project
5 Team to evaluate how well the Build Corridor Alternatives and No Build Alternative meet those
6 needs, are summarized in **Table 1-1**. The *Purpose and Need Memorandum* (ADOT 2017k)
7 provides additional technical information and is available on the project website: i11study.com/.

8 **Table 1-1. Purpose and Need Metrics**

Need	Purpose	Metric
Population and Employment Growth: High-growth areas need access to the high-capacity, access-controlled transportation network.	Provide a high-priority, high-capacity, access-controlled transportation corridor to serve population and employment growth.	Provides access to planned growth areas.
Traffic Growth and Travel Time Reliability: Increased traffic growth reduces travel time reliability due to unpredictable freeway conditions that impede travel flows and hinder the ability to move people and goods around and between metropolitan areas efficiently.	Support improved regional mobility for people and goods to reduce congestion and improve travel efficiency.	Reduces travel time for long-distance traffic (2040 travel time from Nogales to Wickenburg in minutes). The I-11 facility achieves LOS C or better in rural areas and LOS D or better in urban areas (Tucson).
System Linkages and Regional Mobility: The lack of a north-south interstate freeway link in the Intermountain West constrains trade, reduces access for economic development, and inhibits efficient mobility.	Connect metropolitan areas and markets in the Intermountain West with Mexico and Canada through a continuous, high-capacity transportation corridor.	Attracts/diverts traffic from existing roadways, as measured by: <ul style="list-style-type: none"> • Percent increase in vehicle miles traveled (VMT) in the Study Area compared to the No Build Alternative. • Percent increase in truck VMT in the Study Area compared to the No Build Alternative.
Access to Economic Activity Centers: Efficient freeway access and connectivity to major economic activity centers are required to operate in a competitive economic market.	Enhance access to the high-capacity transportation network to support economic vitality.	Serves key economic centers (number of economic activity centers).



Need	Purpose	Metric
<p>Homeland Security and National Defense: Alternate interstate freeway routes help alleviate congestion and prevent bottlenecks during emergency situations. These routes may be parallel or may generally serve the same major origin and destination points, with local or regional roads connecting the freeway routes in various places.</p>	<p>Provide for alternate regional routes to facilitate efficient mobility for emergency evacuation and defense access.</p>	<p>Provides an alternate regional route to existing interstate route.</p>

1 **1.1.2 Other Desirable Outcomes**

2 Cooperating agencies and project stakeholders identified desirable outcomes for I-11 that were
3 considered in alternatives development and evaluation. They are:

- 4 • Provide the opportunity for multimodal use as the need arises in the future.
- 5 • Support the protection of sensitive tourist attractions in accordance with applicable plans
6 and policies.
- 7 • Support the protection of the environment and cultural resources in accordance with
8 applicable plans and policies.
- 9 • Support coordination with other federal and state agencies to maintain the integrity of wildlife
10 movement.

11 **1.2 Summary of Changes Since Draft Tier 1 EIS**

12 **1.2.1 Arizona Travel Demand Model Update**

13 Population, employment, and traffic projection data used to support the Purpose of and Need for
14 I-11 in the Draft Tier 1 EIS were based on an analysis of the AZTDM. For the Draft Tier 1 EIS,
15 the most recent available data used to represent existing conditions were from 2015, and the
16 roadway network reflected the *2018-2022 Statewide Transportation Improvement Program*
17 (STIP) and *2018-2022 Five-Year Facilities Construction Program* (ADOT 2017a, 2017b). For the
18 Final Tier 1 EIS, an updated analysis used the current AZTDM with incorporated 2018 data to
19 represent existing conditions and reflects the *2019-2023 Statewide Transportation Improvement*
20 *Program* and *2020-2024 Five-Year Transportation Facilities Construction Program* (ADOT
21 2019a, 2019b). The 2040 No Build highway network reflects several recently completed
22 widening and freeway expansion projects. As of September 2020, the population and
23 employment projections in the current AZTDM are the same as those used in the Draft Tier 1
24 EIS.

25 Tables from the Draft Tier 1 EIS that presented data derived from the AZTDM have been
26 revised to reflect 2018 traffic counts and updated 2040 No Build data. As shown in **Table 1-2**,

1 the updated traffic model indicates that, while existing highways in the Study Area are generally
 2 operating at LOS C or better in 2018, by 2040 traffic in both rural and urban areas would
 3 deteriorate. Both the traffic operations and projected increase in congestion are consistent with
 4 traffic model results presented in the Draft Tier 1 EIS. Existing condition travel time ratings,
 5 originally shown in Draft Tier 1 EIS **Figure 1-7**, have not changed.

6 The updated 2040 LOS shown on **Figure 1-1** are similar to those evaluated in the Draft Tier 1
 7 EIS, with LOS F traffic conditions projected to occur throughout the I-10 Corridor in western
 8 Maricopa County, between Casa Grande and Phoenix, and in Tucson. US 60 still shows LOS F
 9 between Phoenix and Wickenburg.

10 Peak period travel times and average speeds for 2018 are similar to those reported for 2015 in
 11 the Draft Tier 1 EIS and have not changed for 2040 No Build. As shown in **Table 1-3**, travel
 12 times between Nogales and Wickenburg would generally increase by more than 90 minutes,
 13 and average speeds would decrease by as much as 23 miles per hour (mph). **Table 1-4** shows
 14 a similar trend with increasing travel times and decreasing speeds through urban areas in the
 15 Study Area.

16 **Table 1-2. Average Weekday Traffic and Level of Service,**
 17 **2018 and 2040 (No Build Alternative)**

Facility	City Pair	Lanes	Average Weekday Traffic ^a	Level of Service
2018				
I-19	Nogales–Tucson	4	17,700–86,600	C or better to E
I-10	Tucson–Casa Grande ^{b,c}	4 to 8	43,500–167,100	C or better to E
I-8	Casa Grande–Gila Bend	4	6,300–10,400	C or better
SR 85	Gila Bend–I-10	4	11,800–20,600	C or better
2040				
I-19	Nogales–Tucson ^{c,d}	4 to 6	26,700–112,900	C or better to E ^e
I-10	Tucson–Casa Grande ^{b,c,d}	6 to 8	71,600–228,100	C or better to F
I-8	Casa Grande–Gila Bend ^d	4	7,500–25,900	C or better
SR 85	Gila Bend–I-10 ^d	4	17,300–59,700	C or better

18 SOURCE: **Appendix E2** (Travel Forecasting Methods and Analysis Report); Transportation Research Board 2010.
 19 ^a 2018 average weekday traffic counts from ADOT Transportation Management System. Rounded to nearest thousand.
 20 ^b This represents an average condition of 60 miles of I-10 between I-19 and I-8, which includes the Tucson central business district.
 21 ^c The number of travel lanes varies across this segment.
 22 ^d LOS varies across this segment.
 23 ^e One additional travel lane in each direction between San Xavier Way and Ajo Road improves 2040 LOS.
 24
 25

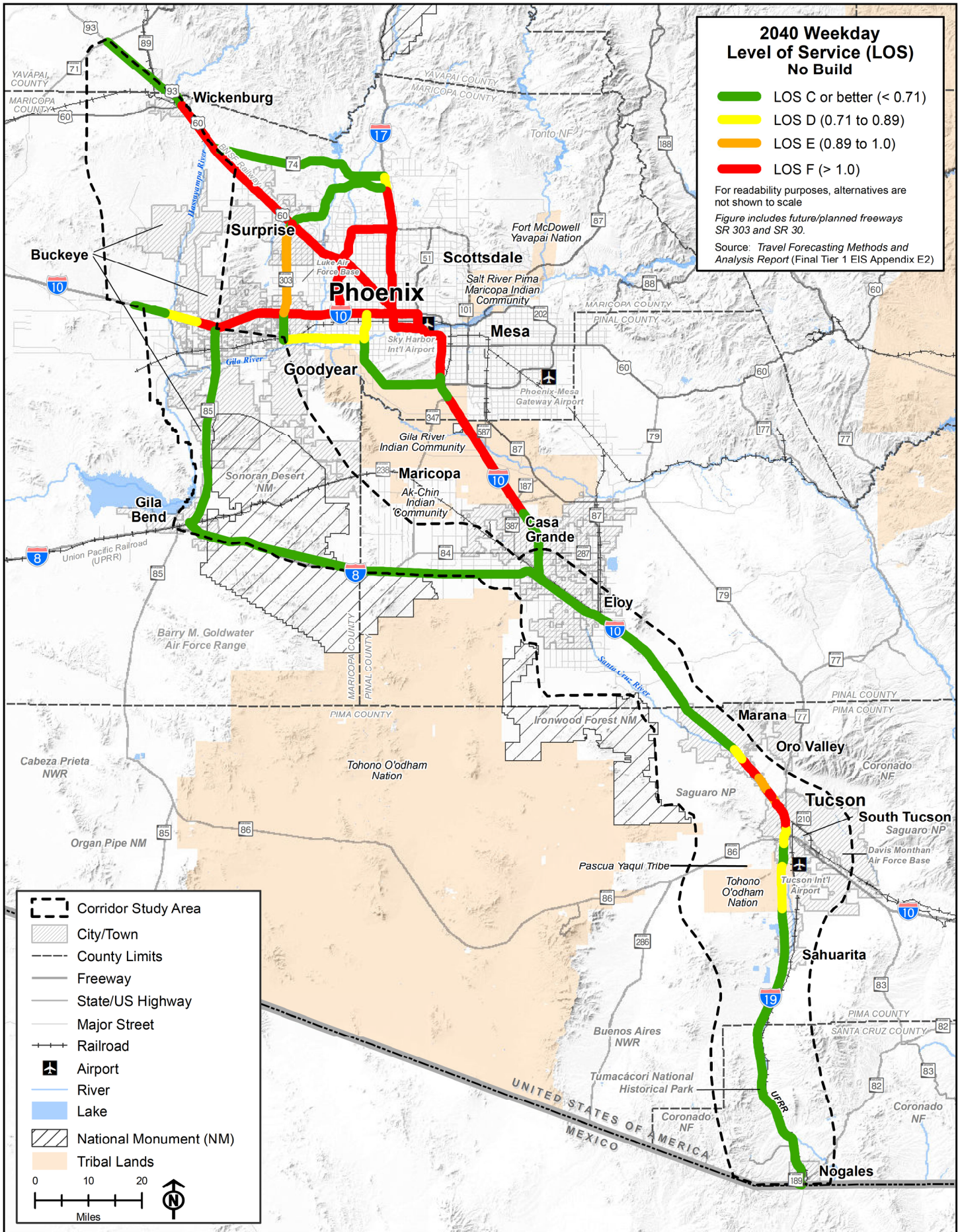


Figure 1-1. Average Weekday Level of Service, 2040



1 **Table 1-3. Peak Period Travel Times from Nogales to Wickenburg in Afternoon,**
2 **2018 and 2040 (No Build Alternative)**

Trips Between Nogales and Wickenburg ^a	North-bound			South-bound		
	Distance (miles)	Travel Time (minutes) ^a	Average Speed (mph)	Distance (miles)	Travel Time (minutes) ^a	Average Speed (mph)
2018						
I-19/I-10/I-17/SR 74/US 60/US 93	244	230	64	244	225	65
I-19/I-10/US 60/US 93	232	245	57	232	240	58
I-19/I-10/I-8/SR 85/I-10/SR 303L/US 60/US 93	275	255	65	275	255	65
I-19/I-10/L101/US 60/US 93	238	230	62	238	235	61
I-19/I-10/L303/US 60/US 93	243	225	65	243	225	65
2040						
I-19/I-10/I-17/SR 74/US 60/US 93	248	331	45	246	347	43
I-19/I-10/US 60/US 93	235	343	41	234	358	39
I-19/I-10/I-8/SR 85/I-10/SR 303L/US 60/US 93	279	329	51	278	335	50
I-19/I-10/L202/I-10/L101/US 60/US 93	241	326	44	240	340	42
I-19/I-10/L202/I-10/L303/US 60/US 93	246	320	46	245	332	44
I-19/I-10/L101/US 60/US 93	242	342	44	240	355	41
I-19/I-10/L303/US 60/US 93	246	335	44	245	348	42

3 SOURCE: **Appendix E2** (Travel Forecasting Methods and Analysis Report)

4 ^a Travel times based on Google estimates for a 4 p.m. departure on March 14, 2018.

5
6

1 **Table 1-4. Peak Period Travel Times for City Pairs in Afternoon,**
2 **2018 and 2040 (No Build Alternative)**

City Pair	North-bound			South-bound		
	Distance (miles)	Travel Time (minutes)	Average Speed (mph)	Distance (miles)	Travel Time (minutes)	Average Speed (mph)
2018						
Nogales – Tucson	66	68	58	66	68	58
Tucson – Casa Grande	66	68	58	66	68	58
Casa Grande – Phoenix	50	60	50	50	58	52
Phoenix – Wickenburg	65	82	48	65	70	56
Casa Grande – Wickenburg	114	125	55	114	115	59
2040						
Nogales – Tucson	66	68	60	66	70	56
Tucson – Casa Grande	66	83	48	66	77	51
Casa Grande – Phoenix	54	84	38	54	93	35
Phoenix – Wickenburg	67	120	34	67	130	31
Casa Grande – Wickenburg	141	170	50	141	185	46

3 SOURCE: **Appendix E2** (Travel Forecasting Methods and Analysis Report)
4 NOTE: Travel times based on Google estimates for a 4 p.m. departure on March 14, 2018.

5 **1.2.2 Economic Centers Figure Update**

6 **Figure 1-2** shows the areas where local municipalities are planning for high growth (in pink)
7 overlaid with existing and emerging economic centers. The figure has been updated to
8 recognize additional employment clusters, refine freight center locations, clarify names and
9 descriptions, and include additional airports (ESI 2020).

10 **1.2.3 Population and Employment Projections**

11 Comments on the Draft Tier 1 EIS questioned whether recently updated population projections
12 from the Pima Association of Governments (PAG) would change the analysis, as recent
13 projections scale back growth rates in Pima County. The population and employment
14 projections in AZTDM have not been updated since the Draft Tier 1 EIS analysis. As shown in
15 **Table 1-5** and **Table 1-6**, 2040 population and employment numbers, respectively, were
16 generally lower than those currently projected for Maricopa County, and higher than those
17 projected for Pima and Pinal Counties.

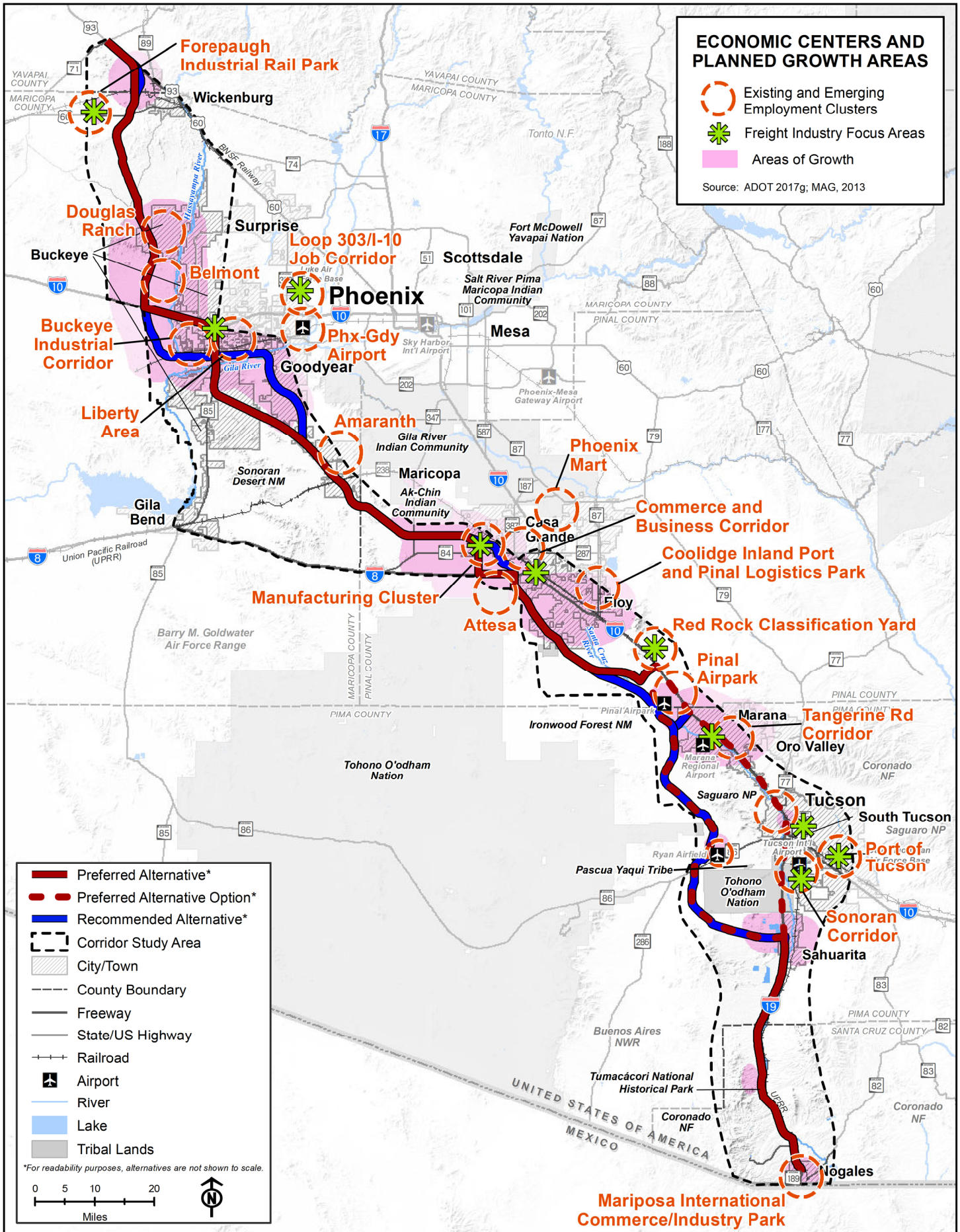


Figure 1-2. Updated Map of Key Economic Centers and Growth Areas in the I-11 Study Area



1 Tier 2 studies will update the traffic analysis using regional travel demand models, which offer
 2 more frequently updated projections, have more detailed traffic analysis zones, and are better
 3 calibrated to local traffic behavior. These future studies would determine the number of lanes
 4 needed to accommodate travel demand forecasts and could recommend a phased
 5 implementation that incrementally builds additional lanes as the demand grows rather than all at
 6 once.

7 **Table 1-5. Comparison of 2040 Population Projections**

County	Draft Tier 1 EIS Data ^a	Updated Regional Data	Difference
Pima	1,393,743	1,209,498 ^b	-184,245 (-13%)
Pinal	916,341	862,622 ^c	-53,179 (-6%)
Maricopa	6,202,435	6,332,264 ^c	129,829 (2%)

8 SOURCE: **Appendix E2** (Travel Forecasting Methods and Analysis Report)

9 ^a ADOT AZTDM projections dated June 2016.

10 ^b PAG Regional Travel Demand Model, projections dated February 2020.

11 ^c MAG Regional Travel Demand Model, projections dated October 2019.

12 **Table 1-6. Comparison of 2040 Employment Projections**

County	Draft Tier 1 EIS Data ^a	Updated Regional Data	Difference
Pima	495,569	504,496 ^c	8,927 (2%)
Pinal	294,010	169,041 ^b	-124,969 (-43%)
Maricopa	2,777,753	3,004,275 ^b	226,522 (8%)

13 SOURCE: **Appendix E2** (Travel Forecasting Methods and Analysis Report)

14 ^a ADOT AZTDM projections dated June 2016.

15 ^b PAG Regional Travel Demand Model, projections dated February 2020.

16 ^c MAG Regional Travel Demand Model, projections dated October 2019.

17



2 ALTERNATIVES CONSIDERED IN DRAFT TIER 1 EIS

This chapter briefly summarizes the Purple, Green, and Orange Alternatives described in more detail in the Draft Tier 1 EIS and shown on **Figure 2-1**. These three original Build Corridor Alternatives formed the building blocks of the Recommended Alternative (Draft Tier 1 EIS) and Preferred Alternative (Final Tier 1 EIS). The Recommended Alternative described in

Read **Chapter 6** (Preferred Alternative) to learn about the Preferred Alternative and how it compares to the Recommended Alternative that was presented in the Draft Tier 1 EIS.

Chapter 6 (Recommended Alternative) of the Draft Tier 1 EIS is a hybrid alternative. It is comprised of portions of the Purple, Green, and Orange Alternatives. The Preferred Alternative in **Chapter 6** (Preferred Alternative) of this Final Tier 1 EIS is also a hybrid. No changes have been made to the initial Purple, Green, and Orange Alternatives detailed in the Draft Tier 1 EIS.

A comparison of the public feedback and environmental impacts of the No Build, Recommended, and Preferred Alternatives can be found in **Chapter 6** (Preferred Alternative). Detailed responses to comments can be found in **Appendix H** (Comments on Draft Tier 1 EIS and Responses). Implementation and phasing are also discussed in **Chapter 6** (Preferred Alternative).

2.1 Recommendations from Prior Plans and Studies

Recommendations for major transportation corridors in prior regional plans and studies were a primary input into the initial alternatives considered for the I-11 Corridor. Specifically, the *I-11 and Intermountain West Corridor Study* (NDOT and ADOT 2014) evaluated likely potential routes for a new high-priority, high-capacity transportation corridor and recommended a study area for a future environmental process.

2.2 Alternatives Development Process

The Tier 1 EIS alternatives development process narrowed down a large initial range of suggested options to a smaller reasonable range to carry forward for detailed evaluation in the Draft Tier 1 EIS. The Project Team, comprised of FHWA, ADOT, and their consultant team, first developed a range of corridor options (or segments) within the Study Area and lettered them from A to W. The corridor options were based on prior plans and studies, agency scoping input, public input, tribal coordination, and technical analysis. The Project Team eliminated options that did not perform as well as others in the same area and then combined remaining options to form three end-to-end Build Corridor Alternatives (Purple, Green, and Orange).

The Purple, Green, and Orange end-to-end Build Corridor Alternatives and the lettered options are shown on **Figure 2-1**.

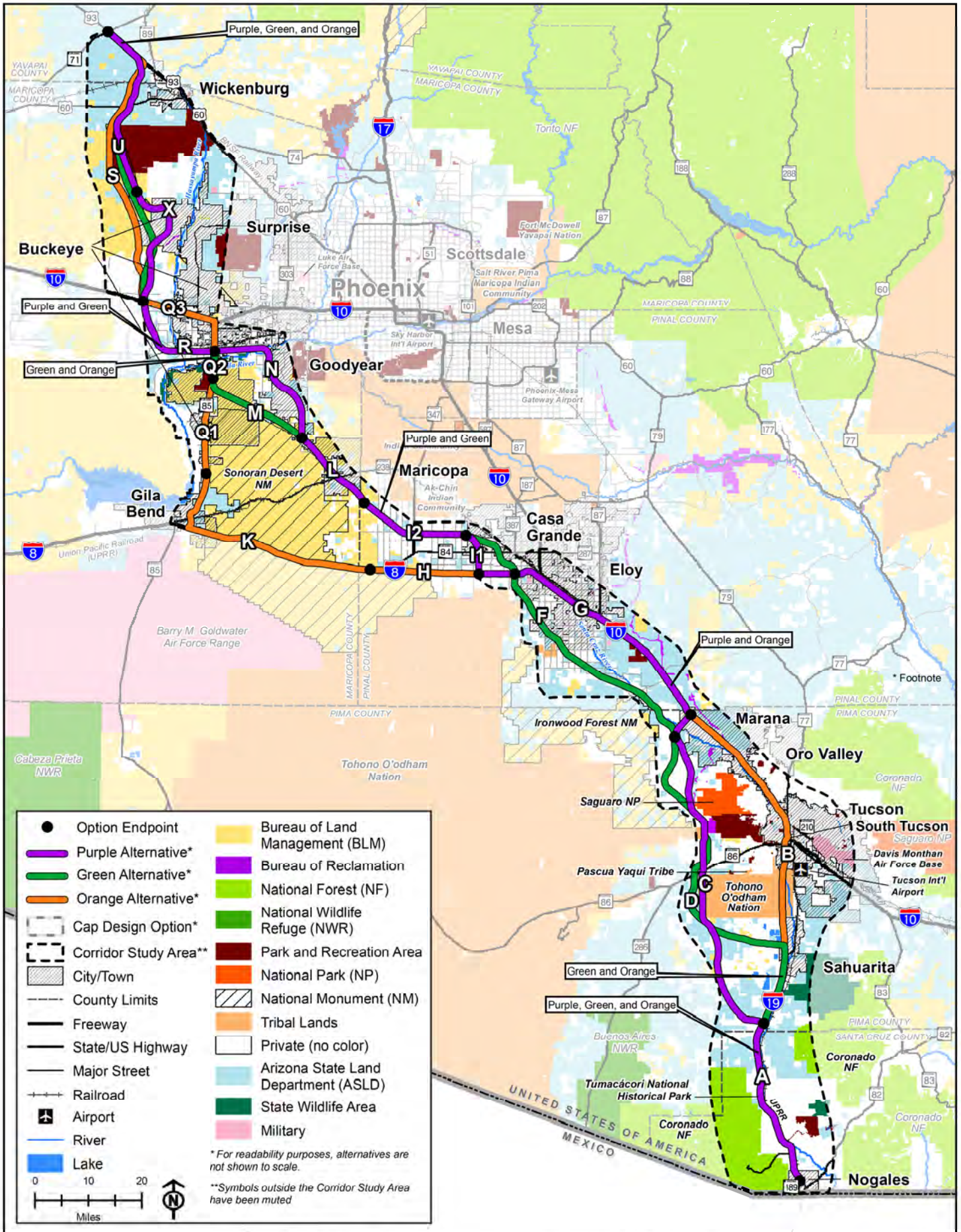


Figure 2-1. Draft Tier 1 EIS Build Corridor Alternatives



1 **2.3 End-to-End Build Corridor Alternatives**

2 The end-to end Build Corridor Alternatives (Purple, Green, and Orange) represent the range of
3 viewpoints gathered from stakeholders, agencies, tribes, and the public during the NEPA
4 scoping process. The Orange Alternative consists mostly of existing interstate and highway
5 corridors. The Green Alternative is primarily new corridors not co-located with existing
6 highways, and the Purple Alternative is a mix of existing and new corridors.

7 Each of the Build Corridor Alternatives is a 2,000-foot-wide corridor. If a Build Corridor
8 Alternative is selected in the Tier 1 EIS Record of Decision, ADOT would undertake a Tier 2
9 NEPA analysis for individual segments when funding becomes available. The Tier 2 analysis
10 would identify a specific alignment, assumed to be approximately 400 feet wide, within the
11 2,000-foot-wide corridor. Economic growth in Arizona will result in demands on all modes of
12 transportation, not just interstate highways. The 2,000-foot-wide corridor provides the flexibility
13 for, and does not preclude, future studies to also consider co-location of rail or utilities.

14 **Figure 2-1** shows the end-to-end Build Corridor Alternatives (Purple, Green, and Orange).

15 The No Build Alternative is the baseline for comparison to the Build Corridor Alternatives and is
16 evaluated as a full alternative in the Draft Tier 1 EIS. The No Build Alternative consists of the
17 existing transportation system as well as committed transportation projects that are
18 programmed for funding in ADOT’s *2018-2022 Five-Year Transportation Facilities Construction*
19 *Program* (ADOT 2017a).

20 **2.4 Comparison of Alternatives**

21 **Section 2.4** (Comparison of Alternatives) of the Draft Tier 1 EIS compares the Purple, Green,
22 and Orange Alternatives in detail based on how well they met the purpose of and need for the
23 project as well as cost. The Orange Alternative would be co-located with the greatest number of
24 existing state freeways and would create the least new lane miles (415 miles). The Green
25 Alternative would create the most new lane miles (930 miles), and the Purple Alternative would
26 create 758 new lane miles. The Orange Alternative is 280 miles long, the Green Alternative is
27 268 miles long, and the Purple Alternative is 271 miles long. The Recommended Alternative in
28 the Draft Tier 1 EIS was a hybrid of mainly the Purple and Green Alternatives.

29 **Chapter 6** in the Draft Tier 1 EIS summarizes the Recommended Alternative, and **Chapter 6** in
30 this Final Tier 1 EIS summarizes and compares the Recommended and Preferred Alternatives.

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1 **3** **AFFECTED ENVIRONMENT AND ENVIRONMENTAL**
2 **CONSEQUENCES**

3 **3.1** **Introduction**

4 **Section 3.1** (Introduction) of the Draft Tier 1 EIS described the organization of **Chapter 3**. The
5 organization is now discussed in the Final Tier 1 EIS Introduction and Reader's Guide.

6 **3.2** **Summary of Key Environmental Impacts**

7 **Section 3.2** (Summary of Key Environmental Impacts) of the Draft Tier 1 EIS summarized the
8 impacts of the Purple, Green, and Orange Alternatives. The summary is not repeated in this
9 Final Tier 1 EIS. A summary of impacts from the hybrid Recommended and Preferred
10 Alternatives is in **Chapter 6** (Preferred Alternative) and the Executive Summary.

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1 **3.3 Land Use and Section 6(f)**

2 **3.3.1 Summary of Draft Tier 1 EIS**

3 The Draft Tier 1 EIS examined the following existing land use, future/planned land use, and
4 special designated lands within the I-11 Corridor Study Area (Study Area).

Existing/Planned Land Use:

- Residential
- Agriculture
- Tribal Lands
- Commercial
- Industrial
- Mixed Use
- Office
- Recreation/Open Space
- Public/Private Institutions
- Transportation/Parking
- Vacant
- Unclassified
- Waterbodies

Special Designated Lands:

- Areas of Critical Environmental Concern (Bureau of Land Management [BLM])
- National Monument (BLM)
- Roadless Area (US Forest Service [USFS])
- Deeded Lands (Reclamation)
- State Wildlife Area (Arizona Game and Fish Department [AGFD])
- Wilderness (BLM)
- Wilderness (National Park Service [NPS])
- Wilderness (USFS)

5
6 FHWA and ADOT quantified existing and planned land uses within each of the 2,000-foot-wide
7 corridors. Existing land uses were based on data (geographic information system [GIS]
8 shapefiles) from the Maricopa Association of Governments (MAG), Pima Association of
9 Governments (PAG), and Santa Cruz County general and comprehensive plans. Planned land
10 uses were based on data from MAG, Pinal County, and Santa Cruz County. Yavapai County
11 does not maintain existing or planned land use data. Land use categories are not consistent
12 among these plans; therefore, ADOT grouped designations as shown in **Table 3.3-1** and **Table**
13 **3.3-2**. The tables display how inconsistencies in land use designations were present between
14 the different data sources and between existing and planned land use designations from the
15 same source. Designations were grouped to provide a better overall picture of general land use
16 categories.

17 All the Build Corridor Alternatives would impact land use and special designated lands. Impacts
18 would include the conversion of existing land use to the transportation facility. The Project could
19 result in an increase in development density near and in the vicinity of I-11 interchanges. The
20 actual effects and their magnitude cannot be determined during the Tier 1 phase of the project.
21 Additional factors such as the timing of future construction and overall urban development,
22 identified and planned by local governments, within the Study Area would also impact changes
23 to land use and special designated lands.

24 Section 6(f) properties were evaluated to ensure compliance with the Land and Water
25 Conservation Fund Act (LWCFA) of 1965 (16 United States Code [U.S.C.] 4601-4 to 4601-11 et
26 seq.). The Draft Tier 1 EIS summarized the impacts to Section 6(f) properties and concluded
27 that the Green and Orange Alternatives would have similar impacts on Section 6(f) resources
28 (Buckeye Hills Regional Park). The Purple Alternative would not affect Section 6(f) properties.



1

Table 3.3-1. Draft Tier 1 EIS Existing Land Use Designations

Existing Land Use Designation	Draft Tier 1 EIS Land Use Designation
Maricopa Association of Governments	
Single Family Medium Density – 1 to 4 dwelling units/acre	Residential
Agriculture	Agriculture
Commercial High – Community Retail/Regional Retail	Commercial
Industrial	Industrial
Mixed Use	Mixed Use
Business Park	Office
Passive/Restricted Open Space/Undevelopable	Recreation/Open Space
Public/Special Event/Military	Public/Private Institutions
Transportation	Transportation/Parking
Vacant	Vacant
Water	Waterbodies
Pima Association of Governments	
Residential	Residential
Agriculture	Agriculture
Commercial	Commercial
Industrial	Industrial
Miscellaneous ^a	
Vacant Land	Vacant
Miscellaneous ^a	Unclassified
Blank	
Santa Cruz County	
Residential	Residential
Agriculture	Agriculture
Commercial	Commercial
Industrial	Industrial
Vacant Land	Vacant
Miscellaneous	Unclassified
Blank	

2
3

^a Pima County Association of Governments' GIS shapefile data contain two Miscellaneous categories. One was designated in the Draft Tier 1 EIS as Industrial and the other as Unclassified.



1

Table 3.3-2. Draft Tier 1 EIS Planned Land Use Designations

Planned Land Use Designation	Draft Tier 1 EIS Land Use Designation
Maricopa Association of Governments	
Single Family Medium Density – 1 to 4 dwelling units/acre	Residential
Agriculture	Agriculture
Commercial High – Community Retail/Regional Retail	Commercial
Industrial	Industrial
Mixed Use	Mixed Use
Business Park	Office
Passive/Restricted Open Space/Undevelopable	Recreation/Open Space
Public/Special Event/Military	Public/Private Institutions
Transportation	Transportation/Parking
Vacant	Vacant
Water	Waterbodies
Pima Association of Governments	
Residential	Residential
Medium Intensity Rural/Low Intensity Rural	
Tribal	Tribal
Commercial	Unclassified
Industrial	Industrial
Resource Transition/Park	
Resource Extraction	
Neighborhood Activity Center/Community Activity Center	Public/Private Institutions
Public/Institutional	
Transportation	Transportation/Parking
Pinal County	
Residential	Residential
Commercial	Commercial
Employment	Office
Park	Recreation/Open Space
General Public Facilities/Services	Public/Private Institutions
Airport Reserve	Transportation/Parking
Santa Cruz County	
Residential	Residential
Agriculture	Agriculture
Commercial	Commercial
Industrial	Industrial



Planned Land Use Designation	Draft Tier 1 EIS Land Use Designation
Vacant Land	Vacant
Miscellaneous	Unclassified
Blank	

1 **3.3.2 Summary of Changes Since Draft Tier 1 EIS**

2 **3.3.2.1 Land Use Plans**

3 Based on agency and public feedback on the Draft Tier 1 EIS, the Project Team reviewed
 4 updated land use plans. Comprehensive and general plans provide broad guidelines as to a
 5 community’s goals and aspirations in terms of growth and land development. The plans express
 6 and regulate public policies on transportation, utilities, land use, recreation, and housing. Each
 7 were subject to public review before a city or county could adopt. **Table 3.3-3** lists the land use
 8 plans that the Project Team used to identify land use categories, including special designated
 9 lands and Section 6(f) properties. Updates to those plans did not result in the need to update
 10 information, methodology, or data presented in the Draft Tier 1 EIS, or used to complete
 11 analyses for the Final Tier 1 EIS. Additional details are found in **Appendix E3** (Land Use and
 12 Section 6(f) Technical Memorandum) of the Draft Tier 1 EIS.

13 Several resource agencies, including BLM and Reclamation, requested that the Tier 1 EIS
 14 include a comprehensive list of federal, state, and local plans. The local and county
 15 comprehensive and general land use plans reviewed for the Tier 1 EIS are listed in **Table 3.3-3**.
 16 Many state, local, and regional transportation plans were reviewed during the alternatives
 17 development process (Draft Tier 1 EIS **Chapter 1** [Purpose and Need] and **Chapter 2**
 18 [Alternatives Considered]). Tier 2 will include a comprehensive review of applicable federal,
 19 state, and local laws, policies, and plans and ADOT will coordinate with appropriate land-
 20 managing agencies during Tier 2 analysis to identify applicable laws, policies, and plans. This
 21 coordination may include a review of local resource management plans and modifications to
 22 those plans.

23 **Table 3.3-3. Land Use Plans**

Plan	Year Adopted	Year Updated	I-11 Consistency with Plan	
			Recommended Alternative	Preferred Alternative
City of Buckeye General Plan	2008	2019	X ^a	X ^a
City of Casa Grande General Plan	2009	–	X	X
City of Eloy General Plan	2011	2019	X	X
City of Goodyear General Plan	2014	–	X	X
City of Nogales General Plan	2011	–	X	X
City of South Tucson Comprehensive Plan	2011	–	X	X
City of Tucson General and Sustainability Plan	2013	–	X	X
Maricopa County Comprehensive Plan	2016	–	X	X

Plan	Year Adopted	Year Updated	I-11 Consistency with Plan	
			Recommended Alternative	Preferred Alternative
MAG Interstate 10/Hassayampa Valley Roadway Framework Study ^b	2007	–	–	–
MAG Interstate 8 and Interstate 10 Hidden Valley Transportation Framework Study ^b	2009	–	X	X
Pima Prospers Comprehensive Plan	2015	–	X	X
Pinal County Comprehensive Plan	2009	2019	X	X
Santa Cruz County Comprehensive Plan	2016	–	X	X
Town of Gila Bend General Plan	2017	–	X	X
Town of Marana General Plan	2011	2019	– ^c	X ^c
Town of Sahuarita General Plan	2015	2019	–	X ^d
Town of Wickenburg General Plan	2013	–	X	X
Yavapai County Comprehensive Plan	2012	–	X	X

1 ^a “The City prefers a slightly modified version of the purple alternative, which is detailed further in the transportation master plan.”
2 (City of Buckeye General Plan)
3 ^b See discussion in **Section 6.4.5.1** (Western Maricopa County Area).
4 ^c Location of Preferred Alternative I-10 Connector is more compatible with Marana’s General Plan than the Recommended
5 Alternative I-10 Connector.
6 ^d East Option in Pima County

7 **3.3.2.2 Pima County Conservation Lands System**

8 Pima County, the US Department of the Interior (DOI), and the Coalition for Sonoran Desert
9 Protection requested that Pima County’s Conservation Lands System be considered an affected
10 resource. Pima County adds lands to this system by purchasing land outright, placing
11 easements upon, or zoning land for the purposes of conservation, floodplain protection, or open
12 space. Some lands are broad geographic areas with multiple parcels that are not all owned by
13 Pima County. The Conservation Lands System is a living, ever-changing tool because Pima
14 County is adding lands to this program on an ongoing basis. It has guided county land use
15 planning since first integrated into Pima County’s Comprehensive Land Use Plan in 2001, and it
16 has been included in each subsequent update.

17 **Section 3.14** (Biological Resources) of the Final Tier 1 EIS discusses potential impacts to Pima
18 County’s Conservation Lands System from the Recommended and Preferred Alternatives and
19 includes a Tier 2 commitment (T2-Biological Resources-6) to further analyze impacts as part of
20 Tier 2 studies.

21 Properties formally designated publicly owned land of a public park, recreation area, or wildlife
22 and waterfowl refuge of national, state, or local significance, or land of a historic site of national,
23 state, or local significance, meet the requirements for protection by Section 4(f), as discussed in
24 **Chapter 4** (Draft Preliminary Section 4(f) Evaluation). Lands within the Pima County
25 Conservation Lands System were not evaluated to determine whether the lands qualify as
26 Section 4(f) properties.



1 **3.3.2.3 Land Use Categories**

2 Following review of the Draft Tier 1 EIS, FHWA and ADOT grouped some land use designations
3 differently than in the Draft Tier 1 EIS to provide a more streamlined comparison of uses across
4 alternatives. The groupings for the Draft Tier 1 EIS are shown in **Table 3.3-1** and **Table 3.3-2**
5 and the groupings for the Final Tier 1 EIS are shown in **Table 3.3-4**.

6 **Table 3.3-4. Changes to Existing and Planned Land Use Categories between the**
7 **Draft and Final Tier 1 EIS**

Draft Tier 1 EIS Land Use Designation (Existing and Planned)	Final Tier 1 EIS Land Use Designation (Existing and Planned)
Residential	Residential
Agriculture	Agriculture
Tribal Lands	Tribal Lands
Industrial	Industrial
Commercial	Commercial
Mixed Use	
Office	
Recreation/Open Space	Recreation/Open Space
Public/Private Institutions	Public/Private Institutions
Vacant	Vacant
Transportation/Parking	Unclassified
Unclassified	
Waterbodies	

8 **3.3.3 No Build Alternative**

9 The No Build Alternative would not directly impact existing land uses, planned land uses, or
10 special designated land within the Study Area. The No Build Alternative would include
11 programmed improvements to the regional transportation system that are in ADOT's federally
12 approved State Transportation Improvement Program (STIP). Additionally, the No Build
13 Alternative would not reflect the long-term land use plans in long-range planning documents
14 (general and comprehensive plans) that are oriented around proposed new highway corridors,
15 such as the West Pinal Freeway, Hassayampa Freeway, SR 303L extension, and SR 30
16 extension (as discussed in **Section 3.3.1.3** [Affected Environment] of the Draft Tier 1 EIS). The
17 No Build Alternative is not consistent with Study Area land use plans, nor would it address the
18 need for additional roadway capacity to serve the projected increase in traffic from population
19 and employment growth in and adjacent to the Study Area.

20 The No Build Alternative would not affect any outdoor recreational use of Section 6(f) property.

21 **3.3.4 Recommended Alternative**

22 This section provides a high-level overview of the Recommended Alternative and the impacts
23 on existing and planned land use, land management, special designated lands, and Section 6(f)



1 properties. The acreage of each type of existing and planned land use is shown in **Table 3.3-5**
2 and **Table 3.3-6**, respectively. The acreage of land management and special designated lands
3 is shown in **Table 3.3-7**.

4 No portion of a Section 6(f) property falls within the Recommended Alternative. Therefore, no
5 portions of a Section 6(f) property would be converted to uses other than for public outdoor
6 recreation under the Recommended Alternative.

7 **3.3.5 Preferred Alternative**

8 This section provides a high-level overview of the Preferred Alternative and the impacts on
9 existing and planned land use, land management, special designated lands, and Section 6(f)
10 properties. The acreage of each type of existing and planned land use is shown in **Table 3.3-5**
11 and **Table 3.3-6**, respectively. The acreage of land management and special designated lands
12 is shown in **Table 3.3-7**.

13 **Table 3.3-5. Summary of Existing Land Use in the 2,000-foot-wide Corridors of the**
14 **Recommended and Preferred Alternatives**

Existing Land Use ^a	Recommended Alternative (acres)	Preferred Alternative with West Option in Pima County (acres)	Preferred Alternative with East Option in Pima County (acres)
Residential	3,776	3,206	2,602
Agriculture	6,024	3,308	3,239
Industrial	1,123	1,037	1,074
Commercial	1,518	1,481	2,743
Recreation/Open Space	1,076	5,477	5,477 ^b
Public/Private Institutions	51	23	23
Vacant	30,368	26,948	19,379
Unclassified	3,223	4,159	5,822

15 Source: Maricopa Association of Governments, Pima Association of Governments, Santa Cruz County, AECOM

16 NOTE: Pinal County and Yavapai County do not maintain existing land use data.

17 ^a The current alignment of I-19 bisects tribal land associated with the Tohono O’odham Nation and Pascua Yaqui tribal land located
18 east of the I-10/I-19 system interchange. Tribes are sovereign nations that did not grant FHWA and ADOT permission to study
19 transportation corridors on their land. Widening on I-19 in this area would occur in the median between existing travel lanes, as
20 shown on the concept engineering drawings in **Appendix E1** (Conceptual Drawings) of the Draft Tier 1 EIS.

21 ^b The Pima Association of Governments dataset codes many parks (including Santa Cruz Park) as BLANK within their dataset.
22 These parks are included in the Unclassified category.

23 **Table 3.3-6. Summary of Planned Land Use in the 2,000-foot-wide Corridors of the**
24 **Recommended and Preferred Alternatives**

Planned Land Use	Recommended Alternative (acres)	Preferred Alternative with West Option in Pima County (acres)	Preferred Alternative with East Option in Pima County (acres)
Residential	37,929	31,817	26,239
Agriculture	1,217	1,217	1,217
Tribal Lands	0	0	0 ^a

Planned Land Use	Recommended Alternative (acres)	Preferred Alternative with West Option in Pima County (acres)	Preferred Alternative with East Option in Pima County (acres)
Industrial	5,643	1,302	3,402
Commercial	7,072	8,275	9,332
Recreation/Open Space	6,510	15,013	11,622
Public/Private Institutions	478	817	1,122
Vacant ^b	1,481	1,481	1,481
Unclassified	3,707	4,408	6,092

1 Source: Maricopa Association of Governments, Pima Association of Governments, Pinal County, Santa Cruz County, AECOM
 2 NOTE: Planned land uses are likely to evolve and change, depending on market demand and community needs. Acreages
 3 calculated within the 2,000-foot-wide corridors are based on current general or comprehensive plans and may not reflect actual land
 4 uses in the future. Yavapai County does not maintain planned land use data.

5 ^a The current alignment of I-19 bisects tribal land associated with the Tohono O’odham Nation and Pascua Yaqui tribal land located
 6 east of the I-10/I-19 system interchange. Tribes are sovereign nations that did not grant FHWA and ADOT permission to study
 7 transportation corridors on their land. Widening on I-19 in this area would occur in the median between existing travel lanes, as
 8 shown on the concept engineering drawings in **Appendix E1** (Conceptual Drawings) of the Draft Tier 1 EIS.

9 ^b Per direction from Santa Cruz County, the same land uses are illustrated for existing and planned scenarios.

10 **Table 3.3-7. Summary of Land Management and Special Designated Lands in the**
 11 **2,000-foot-wide Corridors of the Recommended and Preferred Alternatives**

Land Management	Recommended Alternative (acres)	Preferred Alternative with West Option in Pima County (acres)	Preferred Alternative with East Option in Pima County (acres)
Ownership^a			
BLM	6,415	10,861	10,323
National Forest	0	0	0
NPS	0	0	0
Military	0	0	0
Private Land	40,939	38,596	39,999
Reclamation ^a	12	12	0
State Trust Land	12,629	17,241	12,487
Tribal Land	0	0	0
Total	59,995	66,710	62,809
Special Designated Lands			
Areas of Critical Environmental Concern (BLM)	852	1,084	1,084
National Monument (BLM)	0	0	0
Roadless Area (USFS)	0	0	0
Deeded Lands (Reclamation) ^{a, b}	566	566	0
State Wildlife Area (AGFD)	43	278	278
Wilderness (BLM)	0	0	0



Land Management	Recommended Alternative (acres)	Preferred Alternative with West Option in Pima County (acres)	Preferred Alternative with East Option in Pima County (acres)
Wilderness (NPS)	0	0	0
Wilderness (USFS)	0	0	0
Total	1,461	1,928	1,362

1 ^a Ownership acreages were calculated using the Ownership dataset from the Arizona State Land Department (2016), while Specially
 2 Designated Lands were calculated using source data provided by the individual agencies listed above; therefore, total Reclamation
 3 acres differ.

4 ^b Includes the Tucson Mitigation Corridor.
 5

6 The east option in Pima County could impact four Section 6(f) properties. Approximately
 7 131 acres of the Santa Cruz River Park, 0.9 acre of the Francisco Elias Esquer Park, 2 acres of
 8 the Rillito Vista Neighborhood Park, and 184 acres of the Buckeye Hills Regional Park fall within
 9 the 2,000-foot-wide corridor of the east option. Only 184 acres of the Buckeye Hills Regional
 10 Park fall within the 2,000-foot-wide corridor of the west option.

11 3.3.6 Mitigation and Tier 2 Analysis

12 3.3.6.1 Tier 2 Analysis Commitments

13 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
 14 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
 15 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
 16 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
 17 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate land use impacts.
 18 Specifically, ADOT commits to carrying out the following analysis during the Tier 2 process:

- 19 • **T2-LandUse-1:** Conduct environmental studies to identify specific effects to property, zoning
 20 regulations, neighborhoods, or community facilities to determine needed acquisitions,
 21 easements, and displacements.
- 22 • **T2-LandUse-2:** Complete a Final Section 6(f) Evaluation to assess the ability of the Tier 2
 23 Selected Alternative to avoid or minimize impacts to protected properties and identify
 24 specific mitigation measures to offset the remaining impacts.
- 25 • **T2-LandUse-3:** Plan the specific alignment and locations of traffic interchanges in
 26 coordination with local government entities and with public input to address transportation
 27 needs and to minimize the potential for land use conflicts. Also see MM-Section 4(f)-7.

28 3.3.6.2 Mitigation Commitments

29 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
 30 land use impacts from the Project (generally referred to as mitigation measures) during this
 31 Tier 1 process. Specific mitigation that ADOT is committing to implement if a Build Alternative is
 32 selected includes:



- 1 • **MM-LandUse-1:** Avoid or minimize impacts to Section 6(f) properties. Coordinate with
2 agencies that have jurisdiction over Section 6(f) properties. If Section 6(f) properties cannot
3 be avoided, ADOT will identify replacement land.

4 **3.3.6.3 Additional Mitigation to be Evaluated in Tier 2**

5 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
6 above, to include best practices, permit requirements, and/or other mitigation strategies
7 suggested by agencies or the public. Examples of measures that ADOT may evaluate in Tier 2
8 include:

- 9 • Be an active partner in a broader effort with Metropolitan Planning Organizations, local
10 jurisdictions, resource agencies, and private stakeholders to cooperatively plan development
11 in the I-11 Project Area.
- 12 • Coordinate planning for wildlife connectivity, local land use planning, and context-sensitive
13 design. The White Tank Conservancy may be a model for this type of effort, which also
14 could include coordination with Pima County on the implementation of the *Sonoran Desert*
15 *Conservation Plan* (Pima County 2016b).
- 16 • Define alignments that do not use park properties.
- 17 • Incorporate refinement details, such as retaining walls, to minimize the I-11 footprint.
- 18 • If necessary, pursue an amendment to applicable resource management plans to grant
19 right-of-way or otherwise permit construction of an interstate highway through BLM lands.
20 The project would not use property designated as a national monument (Ironwood Forest
21 National Monument or the Sonoran Desert National Monument).

22



1 **3.4 Recreation**

2 **3.4.1 Summary of Draft Tier 1 EIS**

3 The analysis focused on recreation sites/areas for which any portion is contained within the
4 2,000-foot-wide corridors of the Build Corridor Alternatives. Recreation resources were identified
5 through a review of websites and local, state, and federal plans. Recreation sites that currently
6 exist, are under construction, or are within a regulatory permitting stage are included.

7 Federal, state, and local agencies that provide recreation opportunities and facilities in the Study
8 Area include USFS, Bureau of Land Management (BLM), NPS, AGFD, Arizona State Parks and
9 Trails, Arizona State Land Department (ASLD), and local and county governments. Recreation
10 locales on federal lands managed by BLM, NPS, and USFS include two National Monuments,
11 one National Park, one National Historical Park, and one National Historic Trail. Recreation
12 sites/areas on BLM lands include primarily trails, while USFS and NPS areas contain more
13 developed facilities, such as campgrounds and picnic areas. The Study Area also includes three
14 designated wilderness areas – two within the Sonoran Desert National Monument and one
15 within Saguaro National Park. State, county, and municipal parks also provide recreation
16 opportunities.

17 Permanent impacts from the Project could include changes to the recreation setting, increased
18 access to recreational areas, altered experience at recreation locales, and reduced size of
19 recreation areas. The Project could also result in the permanent loss of acreage for recreation
20 opportunities, such as hunting, particularly along corridor options not co-located with an existing
21 interstate. Although recreation opportunities may continue to be available after the construction
22 of I-11, the settings in which they occur could be affected visually or audibly, access to
23 recreation areas may change, and some users may choose to recreate elsewhere. Increased
24 access may attract more visitors to certain recreational areas.

25 The BLM-owned Vulture Mine Recreation Management Zone (RMZ) consists of approximately
26 70,000 acres south of Wickenburg, Arizona. Both the Purple and Green Alternatives go through
27 the western portion of the property, in what BLM identified as a multi-use corridor in the
28 *Bradshaw-Harquahala Resource Management Plan* (RMP) (BLM 2010). The RMP defines this
29 multi-use corridor as being for major utilities and regionally significant transportation uses. The
30 RMP specifies that BLM will coordinate with ADOT in advancing such transportation uses in
31 multi-use corridors. Overlapping the multi-use corridor within the Vulture Mine RMZ is the
32 Vulture Mine Off-road Challenge Race Course for off-highway vehicles. The Purple and Green
33 Alternatives bisect the race course. ADOT has committed to providing connectivity across I-11
34 for continued use of the race course.

35 **3.4.2 Summary of Changes Since Draft Tier 1 EIS**

36 Agency and public feedback focused on potential impacts to local parks, Saguaro National Park,
37 Tucson Mountain Park, and Ironwood Forest National Monument; access to recreation
38 resources; and the economic value of outdoor recreation. NPS cited general concerns about
39 impacts to Saguaro National Park, especially the wilderness located within the park, and
40 focused specifically on noise, visual impacts, and air quality. Saguaro National Park, Tucson



1 Mountain Park, and Ironwood Forest National Monument are outside the 2,000-foot-wide Build
2 Corridor Alternatives.

3 An analysis of the impacts on resources within Saguaro National Park can be found in **Section**
4 **3.8** (Noise), **Section 3.9** (Visual Resources), and **Section 3.10** (Air Quality). Additionally,
5 **Chapter 4** (Draft Preliminary Section 4(f) Evaluation) contains details regarding recreational
6 properties afforded Section 4(f) protection within the Study Area. In the Draft Tier 1 EIS, the
7 Vulture Mine RMZ was referred to as the Vulture Mountains RMZ. BLM clarified the correct
8 name of the property to be Vulture Mine RMZ.

9 Several resource agencies requested that the Tier 1 EIS include a comprehensive list of federal,
10 state, and local plans for managing recreation resources. BLM requested that the Final Tier 1
11 EIS describe BLM policies and regulations for managing recreation. ADOT will coordinate with
12 the appropriate land-managing agencies during the Tier 2 analysis to identify which project-
13 specific laws, policies, and plans apply.

14 Reclamation requested that the Final Tier 1 EIS discuss the CAP canal trail. The CAP canal is a
15 336-mile canal that brings Colorado River water to central and southern Arizona. During
16 construction of the CAP canal, beginning in 1973, Reclamation anticipated the development of a
17 multi-use recreational trail along the entire length of the canal and, wherever possible, acquired
18 sufficient land to allow for a trail to be developed. The Tortolita CAP Trail is listed in **Table 4-3**
19 (in **Chapter 4** [Draft Preliminary Section 4(f) Evaluation] of this Final Tier 1 EIS) as a property
20 outside the Build Corridor Alternatives.

21 **3.4.3 No Build Alternative**

22 If the No Build Alternative is selected, I-11 would not be constructed, and vehicles would
23 continue to utilize the existing transportation network. Only programmed projects would be
24 implemented under this alternative, including pavement preservation and other maintenance
25 projects. The No Build Alternative would not result in impacts to recreation areas beyond
26 already identified improvement projects.

27 **3.4.4 Recommended Alternative**

28 The Recommended Alternative would have similar effects to recreation resources in the region
29 as the other Build Corridor Alternatives. The Project could alter the recreational setting of the
30 Study Area, increase access to recreational areas, and reduce recreational opportunities, such
31 as hunting, on public and private lands. Increased access could either deter or attract visitors to
32 certain recreation areas. The Recommended Alternative goes through the Vulture Mine RMZ in
33 a BLM-designated multi-use corridor, as well as the western portion of the Vulture Mine Off-road
34 Challenge Race Course. ADOT commits to providing connectivity across I-11 for continued use
35 of the race course.

36 **Table 3.4-1** presents an inventory of the recreational properties within the 2,000-foot-wide
37 corridor of the Recommended Alternative. Specific impacts and mitigation requirements at the
38 property level will be determined during Tier 2. For additional information on the properties listed
39 in **Table 3.4-1**, refer to **Chapter 4** (Draft Preliminary Section 4(f) Evaluation).



1 **3.4.5 Preferred Alternative**

2 The Preferred Alternative could alter the recreational setting of the Study Area, increase access
3 to recreational areas, and reduce the opportunities for hunting on public and private lands. The
4 Preferred Alternative goes through the Vulture Mine RMZ, as well as the Vulture Mine Off-road
5 Challenge Race Course within the BLM-designated multi-use corridor. ADOT commits to
6 providing connectivity across I-11 for continued use of the race course.

7 **Table 3.4-1** presents an inventory of recreational properties within the 2,000-foot-wide corridor
8 of the Preferred Alternative. Specific impacts and mitigation requirements at the property level
9 will be determined during Tier 2.

10 **Table 3.4-1. Inventory of Recreational Properties in the 2,000-foot-wide Corridors**
11 **of the Recommended and Preferred Alternatives by Geography**

Geography	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Nogales to Sahuarita	Tumacácori National Historical Park Juan Baustista de Anza National Historic Trail	Tumacácori National Historical Park Juan Baustista de Anza National Historic Trail	
Sahuarita to Marana	Anamax Park	Anamax Park	Anamax Park Bonita Park Camino de la Tierra Trailhead Cañada del Oro (Christina-Taylor Green Memorial River Park) David G. Herrera and Ramon Quiroz Park El Parque de San Cosme El Paso and Southwestern Greenway Estevan Park Francisco Elias Esquer Park Gethsemane Garden of Prayer Julian Wash Archaeological Park Julian Wash Greenway La Mar Park Mike Jacobs Sports Park Pima Community College, Desert Vista Campus Pima Prickly Park Rillito River Park Rillito Vista Neighborhood Park



Geography	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
			San Lucas Community Park Santa Cruz River Park Sweetwater Wetlands Park Ted Walker Park
Marana to Casa Grande	No parks identified	No parks identified	No parks identified
Casa Grande to Buckeye	Palo Verde Regional Park Juan Bautista de Anza National Historic Trail Management Area	Palo Verde Regional Park Juan Bautista de Anza National Historic Trail Management Area Robbins Butte Wildlife Area Buckeye Hills Regional Park (County) Buckeye Hills East SRMA (BLM) Buckeye Hills West Extensive Recreation Management Area (BLM)	
Buckeye to Wickenburg	Vulture Mine RMZ Vulture Mine Off-Road Challenge Race Course Hassayampa SRMA	Vulture Mine RMZ Vulture Mine Off-Road Challenge Race Course Hassayampa SRMA	

1 SRMA = Special Resource Management Area

2 **3.4.6 Mitigation and Tier 2 Analysis**

3 **3.4.6.1 Tier 2 Analysis Commitments**

4 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
5 2,000-foot-wide corridor for the preferred Build Corridor Alternative. Additional analysis in Tier 2
6 will inform (1) the selection of a specific alignment (approximately 400 feet wide) within the
7 selected 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima
8 County. Tier 2 analysis will also identify measures to avoid, minimize, or mitigate impacts to
9 recreation resources. Specifically, ADOT commits to carrying out the following analysis during
10 the Tier 2 process:

- 11 • **T2-Recreation-1:** Coordinate with the appropriate land-managing agencies during the Tier 2
12 analysis to identify applicable laws, policies, and plans for each recreation site.
- 13 • **T2-Recreation-2:** Coordinate with BLM when advancing transportation uses in the multi-use
14 corridor within the Vulture Mine RMZ.
- 15 • **T2-Recreation-3:** Update the list of recreational resources within the project-level Study
16 Area and identify the temporary and permanent impacts to each resource.
- 17 • **T2-Recreation-4:** Review recreation planning documents applicable to the Study Area.
- 18 • **T2-Recreation-5:** Identify site-specific mitigation measures at recreation resources.



1 **3.4.6.2 Mitigation Commitments**

2 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
3 impacts to recreation resources from the Project (generally referred to as mitigation measures)
4 during this Tier 1 process. Specific mitigation that ADOT is committing to implement if a Build
5 Alternative is selected includes:

- 6 • **MM-Recreation-1:** Provide connectivity across I-11 for continued use of the Vulture Mine
7 Off-Road Challenge Race Course in the Vulture Mine RMZ.
- 8 • **MM-Recreation-2:** If the Preferred Alternative with west option is selected during Tier 2
9 studies, address updated access routes to Saguaro National Park and Tucson Mountain
10 Park due to the relocation of Sandario Road on either end of the Tucson Mitigation Corridor
11 as part of the CAP Design Option.
- 12 • **MM-Recreation-3:** Evaluate connection between the two segments of the Palo Verde
13 Regional Park in western Pinal County.

14 **3.4.6.3 Additional Mitigation to be Evaluated in Tier 2**

15 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
16 above, to include best practices, permit requirements, and/or other mitigation strategies
17 suggested by agencies or the public. Examples of measures that ADOT may evaluate in Tier 2
18 include:

- 19 • Design route to avoid or minimize impacts on the recreation properties and use of recreation
20 properties.
- 21 • Maintain access to recreation areas and continue to provide connectivity between recreation
22 areas/lands and trails.
- 23 • Schedule construction to avoid peak recreation seasons and special events, including
24 hunting and birdwatching seasons, when possible.
- 25 • Include context-sensitive design in future stages of project development.
- 26 • Develop natural design features, such as earthen berms and vegetative plantings.
- 27 • Include design features, such as fencing and designated crossings, to protect the safety of
28 those using the recreation area.
- 29 • Develop traffic plans that minimize access limitations during construction, minimize the
30 duration of access disruption, and provide on-site and online information about alternative
31 access options.
- 32 • Apply ADOT Noise Abatement Requirements (ADOT 2017m), including potential use of
33 temporary and permanent noise barriers (if not already present) adjacent to parks.



- 1 • Locate construction staging and temporary construction easements away from recreation
- 2 sites to the extent possible.

3



1 3.5 Community Resources, Title VI, and Environmental Justice

2 3.5.1 Summary of Draft Tier 1 EIS

3 **Community Characteristics and Resources:** Community cohesion impacts were assessed by
4 evaluating the communities located within the Build Corridor Alternatives and considering how a
5 new highway would affect that community. The Green Alternative is comprised primarily of new
6 corridors that would go through or come near Sahuarita, Three Points, Picture Rocks, Avra
7 Valley, Red Rock, Eloy, Casa Grande, unincorporated western Pinal County, Goodyear,
8 Buckeye, and Arlington. The Purple Alternative is comprised of a mix of new and existing
9 highways, with fewer new corridors compared to the Green Alternative, and would go through or
10 come near Arivaca Junction, Three Points, Picture Rocks, Marana, Casa Grande,
11 unincorporated western Pinal County, Goodyear, Buckeye, and Arlington. The main differences
12 between the Purple and Green Alternatives are near the junction of I-11 with I-19 (Arivaca
13 Junction versus Sahuarita), in central Pinal County (Eloy and Red Rock), and in Buckeye. The
14 Orange Alternative follows more existing highways than the Purple and Green Alternatives.

15 **Title VI, Environmental Justice, and English Proficiency:** US Census Bureau 2010
16 Decennial Census data were used to characterize the total population, race, and ethnicity
17 demographics of the Study Area (US Census Bureau 2010). American Community Survey
18 5-year estimates for 2011 to 2015 were used to characterize income levels and English
19 proficiency in the Study Area (US Census Bureau 2015a and 2015b). County-level and
20 statewide data were collected to provide a regional comparison. Data on both Census Tracts
21 (CTs) and Census Designated Places (CDPs) were evaluated. CTs are larger geographic
22 county subdivisions that provide complete coverage of the Study Area and its populations.
23 CDPs correspond better to the communities and geographies where people live. The
24 combination of both data points provides complete statistical coverage of the Study Area, with
25 the CDP data complementing the CT data to provide information on the more densely populated
26 areas.

27 Comprehensive tables of demographic data are available in Draft Tier 1 EIS **Appendix E5**
28 **(Demographic Data to Support the Title VI, Environmental Justice, and Limited English**
29 **Proficiency Analysis)**. The analysis to determine the potential for disproportionate impacts
30 followed a more qualitative approach than a project-level environmental justice analysis by
31 calculating the percentage of the Build Corridor Alternatives that would extend through
32 communities with a high percentage of low-income and/or minority populations based on
33 Census data. A threshold of 10 percentage points higher than the county average was used to
34 determine which areas had a high percentage of low-income and/or minority populations.

35 All three Build Corridor Alternatives have the potential to affect communities whose populations
36 have a high percentage of low-income and minorities. While many communities in the Study
37 Area are located along the existing highway facilities, the Orange Alternative passes through the
38 highest number of low-income and minority communities. While co-location with an existing
39 highway facility would likely result in fewer right-of-way impacts, expansion of an existing
40 highway can impact a community in other ways, such as worsening the barrier effect the
41 highway may have already created between neighborhoods or increasing noise levels and
42 visibility. This is especially true in Tucson, where the original construction of I-10 in the 1960s
43 introduced a barrier that divided many of the neighborhoods in downtown Tucson. Expanding



1 I-10 in this area to include an I-11 facility could adversely impact residences and businesses
2 located very close to the existing I-10 right-of-way.

3 In the southern extents of the Study Area, all three Build Corridor Alternatives follow existing
4 I-19 near several communities with high low-income and minority percentages, including
5 Nogales, Rio Rico, Tumacácori-Carmen, Amado, and Arivaca Junction.

6 The Purple and Green Alternatives would generally result in similar overall impacts to minority
7 and low-income populations, but in different specific locations. In the Eloy and Casa Grande
8 area, the Green Alternative is a new corridor west of I-10 and the Purple Alternative co-locates
9 with I-10 and I-8. While the Green Alternative is a new corridor near these communities, south
10 of I-8 it is located primarily on land that is sparsely developed, agricultural, or undeveloped
11 desert. The Purple Alternative would also include a new highway on a new alignment near
12 Goodyear as well as residential and agricultural areas in Buckeye. The Green Alternative avoids
13 Goodyear and is co-located with SR 85 and I-10 through Buckeye.

14 Potential impacts to tribal communities, which have low-income and minority populations, were
15 evaluated. The Orange Alternative extends through the Tohono O'odham Nation on a co-
16 located I-19. I-19 is located on a perpetual transportation easement from the Tohono O'odham
17 Nation, and any future improvements to accommodate I-11 are assumed to occur within the
18 existing transportation easement. The Green and Purple Alternatives do not include any tribal
19 lands. In Pima County, the Green Alternative is farther away from the western boundary of the
20 Tohono O'odham Nation than the Purple Alternative.

21 Data on limited English proficiency (LEP) were also reported in the Draft Tier 1 EIS. These data
22 were collected early in the planning process and informed public outreach strategies for the
23 project. Language groups identified in the Study Area include Spanish, Chinese, and
24 Vietnamese. FHWA and ADOT identified techniques to address and reduce linguistic, cultural
25 institutional, geographic, and other barriers to meaningful participation. More detail on specific
26 outreach techniques can be found in **Chapter 5** (Coordination and Outreach).

27 **3.5.2 Summary of Changes Since Draft Tier 1 EIS**

28 Demographic data sources for this Tier 1 EIS were decennial census and American Community
29 Survey data from the US Census Bureau. These data were not updated or changed. Detailed
30 tables of demographic data can be found in Draft Tier 1 EIS **Table 3.5-4** and **Table 3.5-5**, as
31 well as Draft Tier 1 EIS **Appendix E5** (Demographic Data to Support the Title VI, Environmental
32 Justice, and Limited English Proficiency Analysis).

33 **Agency Comments:** Comments on environmental justice were received from USFS and
34 Reclamation. USFS expressed concern that the figures and analyses were inconsistent in the
35 way they addressed impacts to tribal lands. Census Tract data inventorying all tribal lands in the
36 study area were collected and included in the analysis and are listed in Draft Tier 1 EIS
37 **Appendix E5** (Demographic Data to Support the Title VI, Environmental Justice, and Limited
38 English Proficiency Analysis). While the color and shading of the tribal lands layer in the Draft
39 Tier 1 EIS figures were inconsistent, these inconsistencies were limited to the mapping and
40 were not substantive to the analysis or decision-making process.

1 Reclamation expressed concern that the discussion of mitigation strategies throughout Draft
2 Tier 1 EIS **Section 3.5.4** (Environmental Consequences) was too focused on the need for
3 targeted outreach. Conducting major, proactive efforts to ensure meaningful opportunities for
4 public participation, particularly in low-income and minority communities, is one of the
5 fundamental elements of project-level environmental justice analysis and would be initiated
6 early in the planning process for Tier 2 studies. Demographic data and community outreach
7 strategies would be used to identify specific populations that may be impacted by the project.
8 They would then analyze the potential impacts to these populations and work with the
9 communities to identify solutions to minimize or mitigate these impacts. Draft Tier 1 EIS **Section**
10 **3.5.6** (Future Tier 2 Analysis) describes, in full, all the elements that future Tier 2 environmental
11 justice analyses would address.

12 Final Tier 1 EIS **Section 3.5.6** clarifies that some of these elements could result in the
13 identification of additional mitigation strategies during those Tier 2 studies, such as proposing
14 measures to avoid, minimize, and/or mitigate disproportionately high and adverse effects by
15 providing offsetting benefits and opportunities to enhance communities and neighborhoods.

16 **Public Comments on Community Impacts in Rural Areas:** Commenters from rural
17 communities along the Recommended Alternative expressed that they value the quiet, rural
18 character of their community, and are concerned a highway on a new alignment through their
19 community would destroy that quiet, rural character. Others focused on concerns the new
20 highway corridor would bisect their community, separating neighborhoods and community
21 facilities. Some comments from areas not directly impacted by the Recommended Alternative
22 requested I-11 be shifted farther away from their community. These concerns were considered
23 in identifying the Preferred Alternative and are described in more detail in **Chapter 6** (Preferred
24 Alternative).

25 **Public Comments Providing Additional Data on Community Character and/or**
26 **Demographics:** Some members of the public expressed a concern the analysis did not identify
27 the commenters' specific community as low-income and/or minority, noting local government
28 community development programs or designations. The Tier 1 environmental justice analysis
29 relied on US Census Bureau data to provide a high-level inventory of community demographics.
30 Census data aggregate demographics into larger geographies, which can sometimes mask
31 smaller pockets and neighborhoods of protected populations. As described in **Section 3.5.6**,
32 Tier 2 study recommendations include development of a more detailed community profile for
33 potentially impacted communities. When more detailed analyses based on location-specific
34 impacts are completed during Tier 2 studies, they would use additional data sources and look at
35 communities and individual neighborhoods in more detail.

36 The Project Team took a more conservative approach in the analysis of minority and low-
37 income communities intersected by the Recommended and Preferred Alternatives than the
38 analysis of the Purple, Green, and Orange Alternatives in the Draft Tier 1 EIS. This Final Tier 1
39 EIS considers communities whose percentages of minority and low-income populations exceed
40 50 percent or are equal to or greater than county percentages as a potential minority or low-
41 income population.

42 **Public Engagement during the Draft Tier 1 EIS Study:** FHWA and ADOT have continued to
43 engage diverse populations in outreach efforts during public review of the Draft Tier 1 EIS.
44 Communication strategies for this project address the multicultural and bilingual issues and
45 challenges specific to the Study Area. These strategies were established early in the study

1 process, and include techniques to reduce linguistic, cultural, institutional, geographic, and other
 2 barriers to meaningful participation. Draft Tier 1 EIS **Section 3.5.3.3** (Environmental Justice)
 3 contains more detail regarding the communication strategy and techniques for facilitating
 4 meaningful participation with diverse populations. Public engagement undertaken during the
 5 public review period of the Draft Tier 1 EIS employed these techniques and is described in detail
 6 in **Chapter 5** (Coordination and Outreach) and **Appendix G** (Public Involvement Summary
 7 Report) of this Final Tier 1 EIS. FHWA and ADOT are committed to maintaining government-to-
 8 government relations with Native American tribes for projects that may affect tribal rights and
 9 resources. Tribal coordination continues to be an integral part of this study. More detail on tribal
 10 engagement is contained in **Chapter 5** (Coordination and Outreach) of this Final Tier 1 EIS.

11 **3.5.3 No Build Alternative**

12 Under the No Build Alternative, community impacts would include only those related to projects
 13 already planned and programmed. Improvement projects along SR 189 and I-10 in Nogales and
 14 Casa Grande, respectively, have the greatest potential to affect communities with a high
 15 percentage of minority individuals. The beneficial impacts of the Build Corridor Alternatives,
 16 such as improved travel times, reduced congestion, economic development, and improvements
 17 to regional mobility, would not occur.

18 **3.5.4 Recommended Alternative**

19 The Recommended Alternative is a hybrid alignment that was based primarily on the Purple and
 20 Green Alternatives. **Table 3.5-1** identifies communities whose boundaries fall within the 2,000-
 21 foot-wide corridor of the Recommended Alternative and notes the percentages of low-income
 22 and minorities in the communities' populations.

23 In the southernmost extents of the Study Area (between Nogales and Sahuarita), the
 24 Recommended Alternative follows existing I-19 and any improvements would likely be limited to
 25 the existing right-of-way. Community impacts in this area would likely be limited to noise and air
 26 quality impacts resulting from additional traffic on I-19 or temporary noise and traffic disruptions
 27 during construction. Most of the communities between Nogales and Sahuarita have populations
 28 that exceed 50 percent minority, making them majority minority communities (i.e., one or more
 29 racial or ethnic minority makes up a majority of the local population). Some of them, including
 30 Nogales and Arivaca Junction, are also potentially low-income. The highest percentages of
 31 people that speak English "less than very well" are in the southernmost extents of the Study
 32 Area, specifically in Nogales.

33 In Sahuarita, the Recommended Alternative extends west from I-19 in a new corridor. Much of
 34 the land within the Recommended Alternative between Sahuarita and Wickenburg is vacant,
 35 with no direct impacts to residential or community facility lands; 64 percent of the 2,000-foot-
 36 wide corridor in Santa Cruz, Pima, and Maricopa Counties is vacant (see **Section 3.3** [Land
 37 Use and Section 6(f)]). Pinal and Yavapai Counties do not maintain existing land use data.

38



1 Table 3.5-1. Communities in the 2,000-foot-wide Corridor of the Recommended
2 Alternative

Table with 3 columns: Geography, Community or Census Designated Places (% minority, % low-income), and Alignment Description. Rows include: Nogales to Sahuarita, Sahuarita to Marana, Marana to Casa Grande, Casa Grande to Buckeye, and Buckeye to Wickenburg.

3 SOURCE: US Census Bureau 2010, 2015a, and 2015b.
4 CT=census tract; CDP=census designated place; CDPs and CTs listed south to north
5 Detailed demographic tables can be found in Draft Tier 1 EIS Appendix E5 (Demographic Data to Support the Title VI,
6 Environmental Justice, and Limited English Proficiency Analysis).
7 Bold and underlined percentages exceed 50% or are greater than or equal to county percentages.

8
9 The remaining 36 percent of the 2,000-foot-wide corridor in Santa Cruz, Pima, and Maricopa
10 Counties is developed and is primarily categorized as commercial, agricultural, recreation/open
11 space, or residential land use. Residential land use is present within the 2,000-foot-wide corridor
12 of the Recommended Alternative. The degree and severity of community impacts would depend
13 on the specific alignment and design of I-11 and the character of the community. Potential
14 adverse impacts include right-of-way acquisition, highway traffic noise and air quality impacts,
15 and temporary construction-related impacts such as noise, vibration, air quality, and traffic
16 delays. Being situated near a new highway can also have beneficial effects, such as improved



1 regional connectivity, job creation, better access to jobs and medical services, and economic
2 development.

3 **Figure 3.5-1** through **Figure 3.5-3** illustrate minority demographics overlaid with the
4 Recommended and Preferred Alternatives, and **Figure 3.5-4** through **Figure 3.5-6** illustrate low-
5 income demographics.

6 **Table 3.5-2** provides an inventory of the acreage of low-income and minority communities within
7 the 2,000-foot-wide corridors of the Recommended and Preferred Alternatives. As noted in
8 **Section 3.5.1**, the acreages cited in this table were calculated using a more conservative
9 approach and flagged several additional communities than were identified in the Draft Tier 1
10 EIS, including several in Pima County as well as Palo Verde and Tonopah in western Maricopa
11 County.

12 **Table 3.5-2. Inventory of Acres in Minority and Low-Income Communities in the**
13 **2,000-foot-wide Corridors of the Recommended and Preferred Alternatives**

Acres		Recommended Alternative (acres)	Preferred Alternative with West Option in Pima County (acres)	Preferred Alternative with East Option in Pima County (acres)
Total Project Acres		75,149	66,956	65,016
Potential Minority and Low-Income Populations	Acres (#)	29,257	15,786	18,790
	Acres (% of total corridor acres)	39%	24%	29%

14 Source: US Census Bureau 2010, 2015a, 2015b, 2017.
15

16 The Recommended Alternative is not located on tribal land and would not result in direct
17 impacts to tribal land. It is located approximately 0.3 mile away from the Tohono O’odham
18 Nation San Xavier District, 0.9 mile from the Garcia Strip of the Schuk Toak District, 0.2 mile
19 from San Lucy Farms, and 0.6 mile from the Sif Oidak District.

20

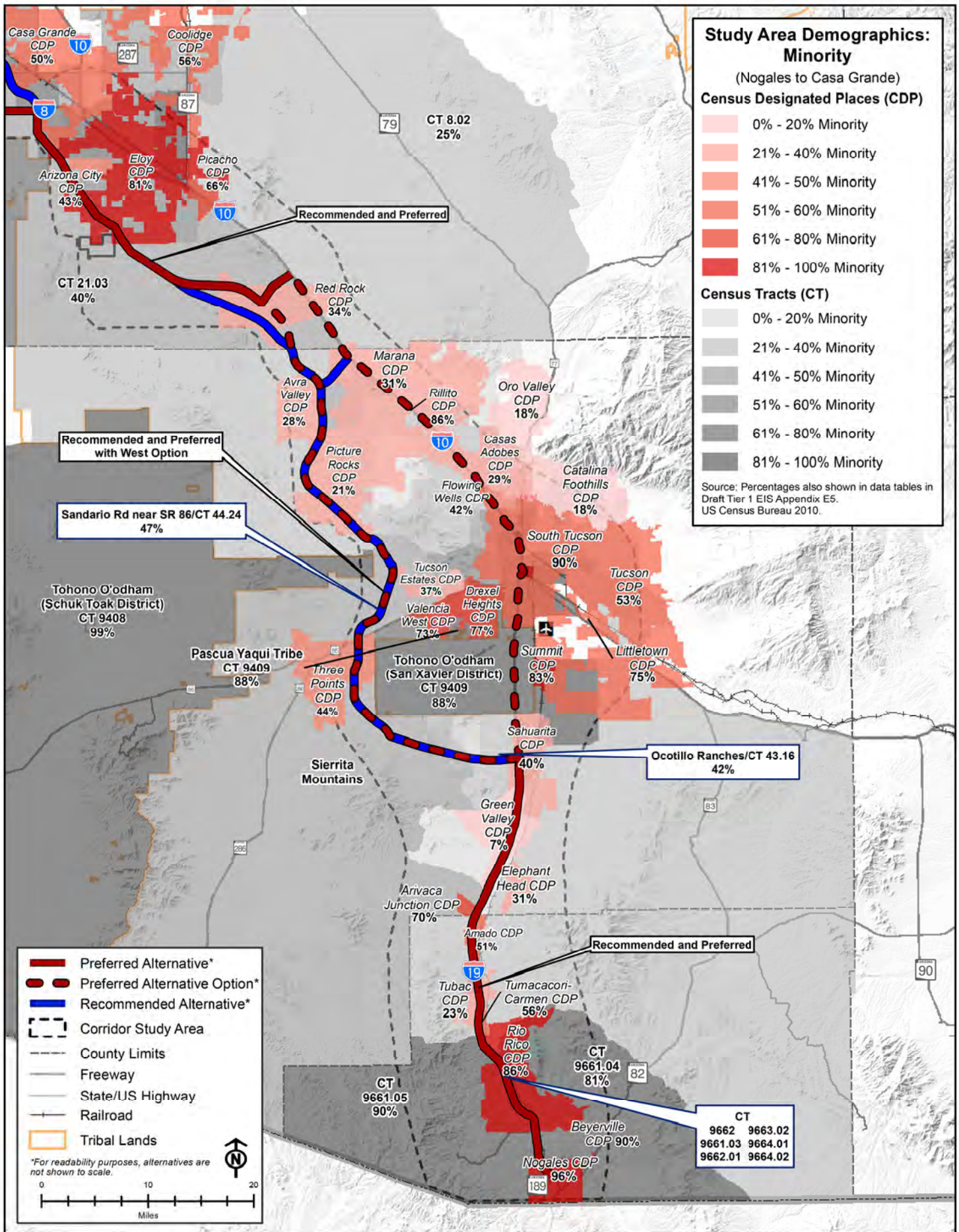


Figure 3.5-1. Minority Demographics: Nogales to Casa Grande

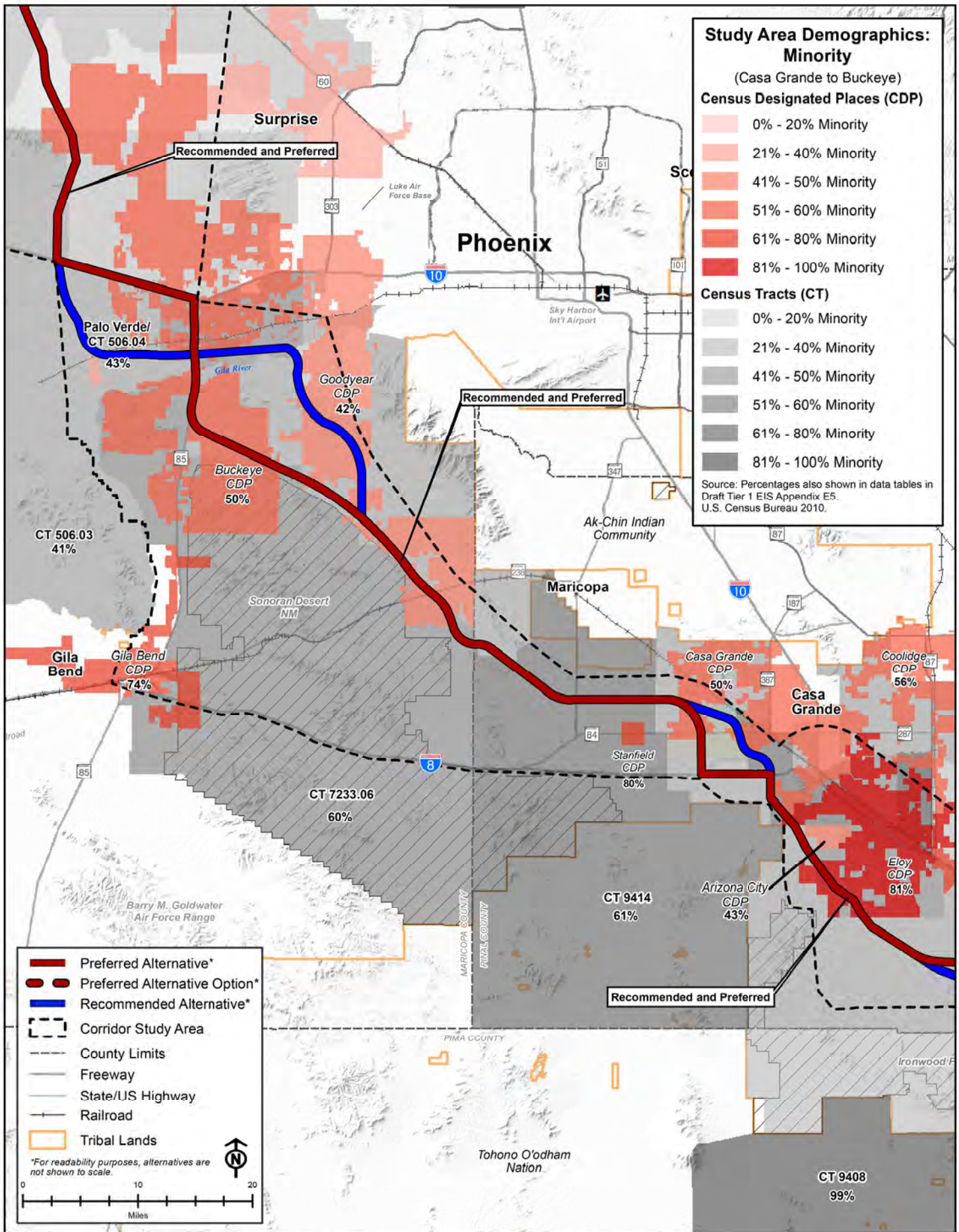


Figure 3.5-2. Minority Demographics: Casa Grande to Buckeye

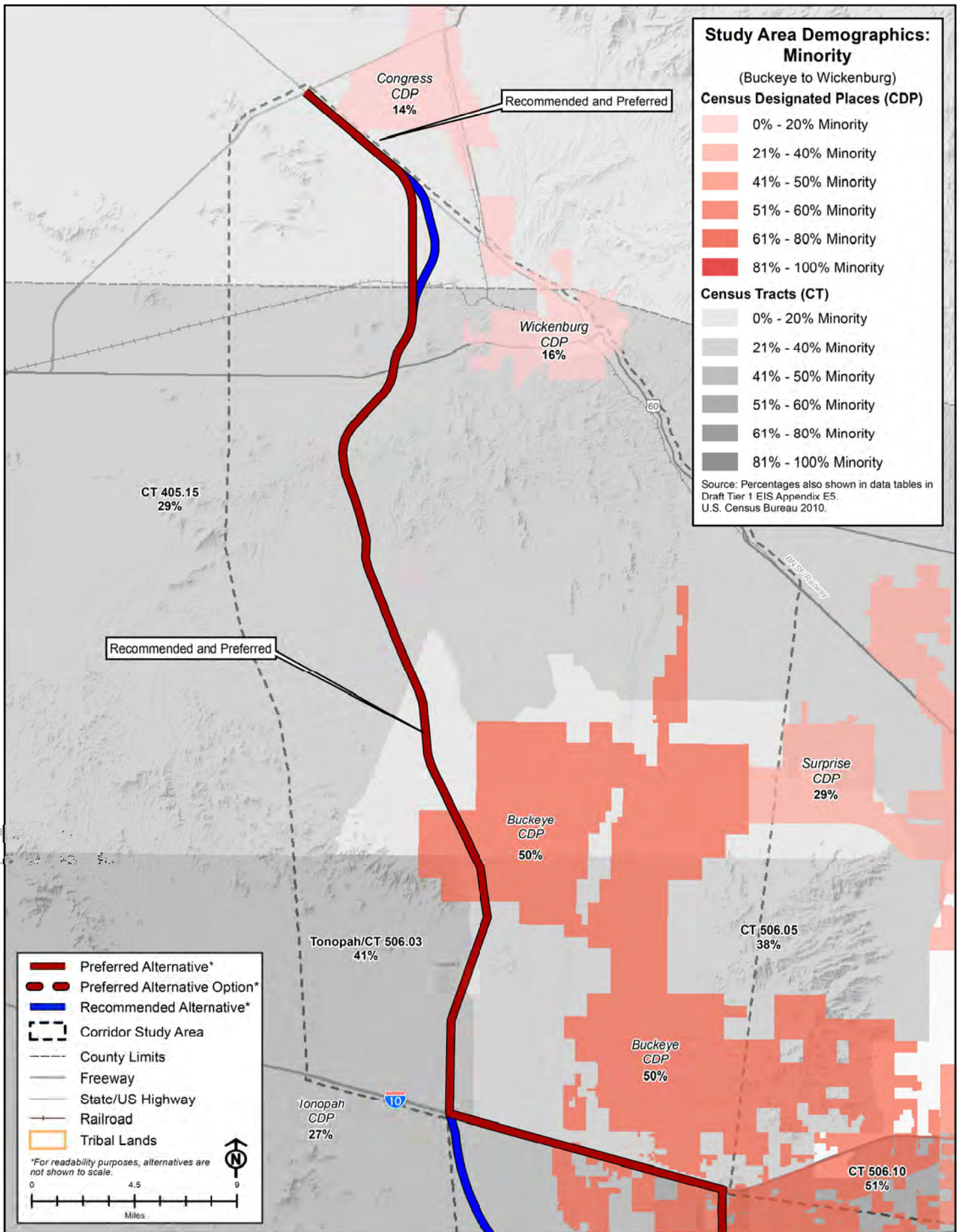


Figure 3.5-3. Minority Demographics: Buckeye to Wickenburg

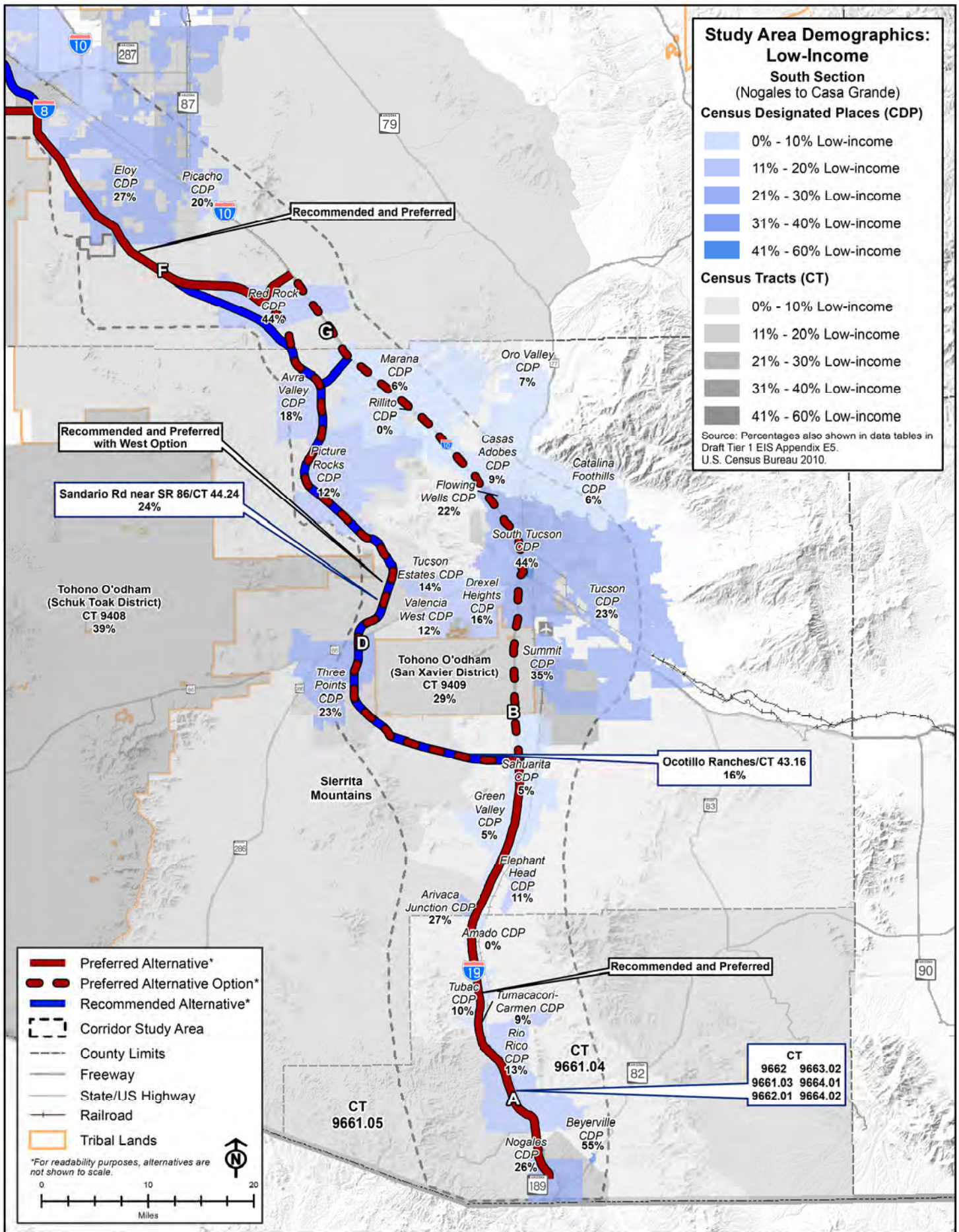


Figure 3.5-4. Low-Income Demographics: Nogales to Casa Grande

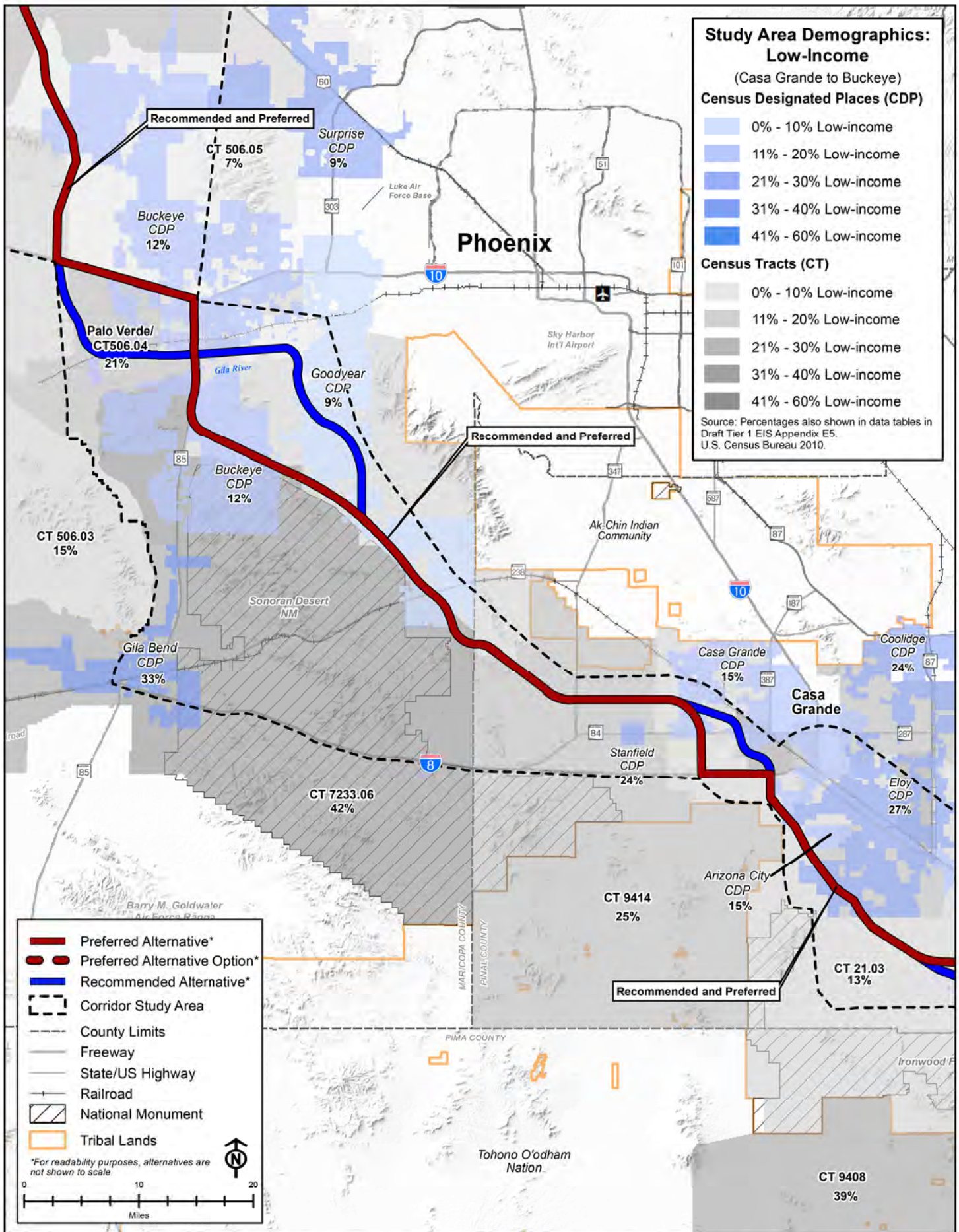


Figure 3.5-5. Low-Income Demographics: Casa Grande to Buckeye

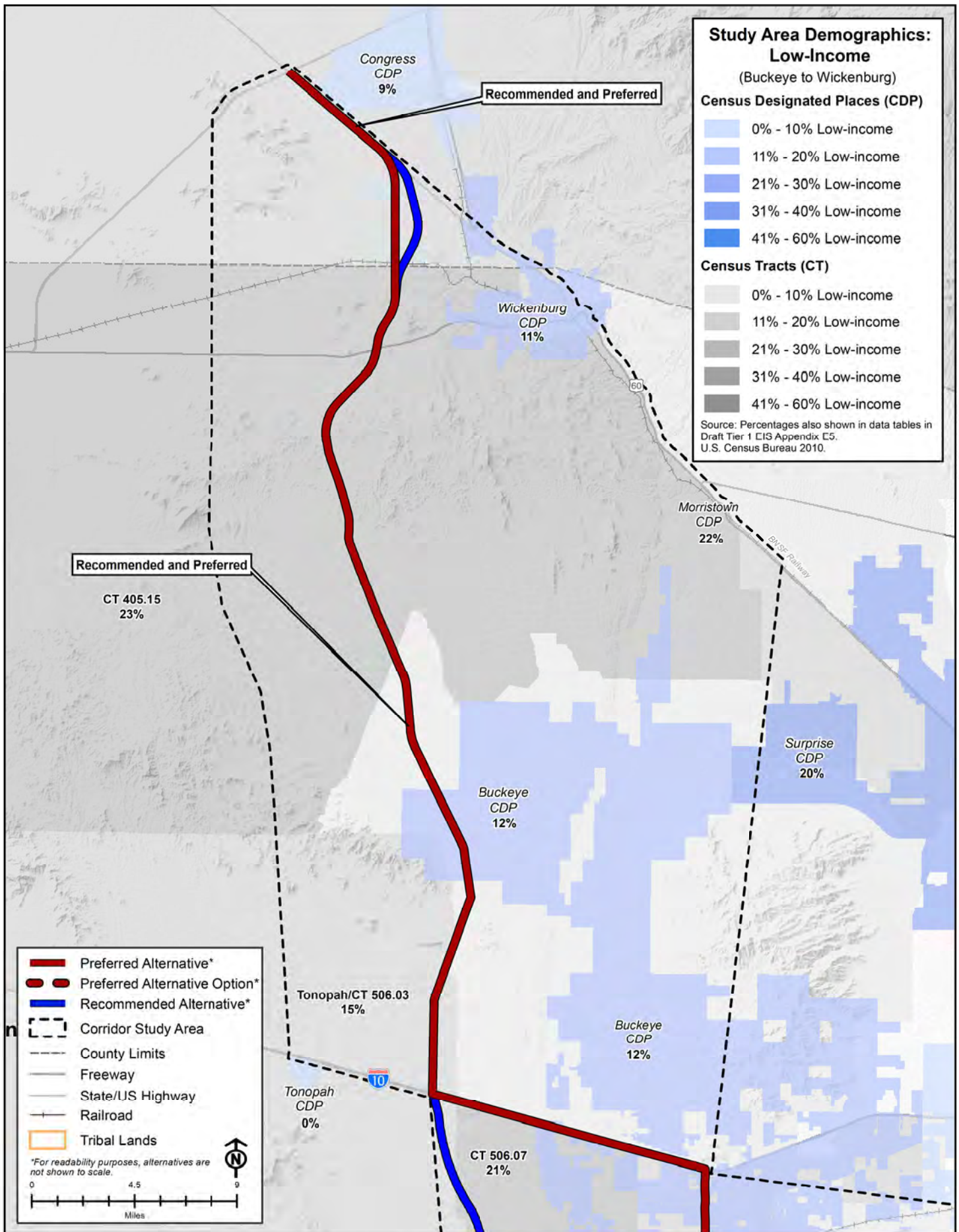


Figure 3.5-6. Low-Income Demographics: Buckeye to Wickenburg

1 **3.5.5 Preferred Alternative**

2 **Table 3.5-3** lists communities that are intersected by the Preferred Alternative and the
 3 percentage of low-income and minority population. The Preferred Alternative follows much of
 4 the same alignment as the Recommended Alternative with some key differences. Under both
 5 options, the Preferred Alternative would be co-located with I-19 from Nogales to Sahuarita and
 6 would experience the same impacts as discussed under the Recommended Alternative
 7 (**Section 3.5.4**).

8 One of the key differences in the Preferred Alternative is the inclusion of two options through
 9 Pima County. Under the Preferred Alternative with east option in Pima County, I-11 is co-
 10 located with I-10. More detailed study and design information is needed to identify the specific
 11 impacts, but improvement to I-10 has the potential to impact many residences and businesses
 12 located next to the existing highway right-of-way. Several of the communities along the east
 13 option exceed 50 percent minority, making them majority-minority communities (including the
 14 San Xavier District of the Tohono O’odham Nation, South Tucson, Tucson, and Rillito).
 15 Similarly, both the San Xavier District and South Tucson exceed county percentages for low-
 16 income by more than 12 and 27 percent, respectively. The demographics of the communities
 17 along the west option in Pima County contain lower percentages of minority and low-income
 18 individuals; however, the Recommended Alternative would be a new highway on a new
 19 alignment through or near those communities. The communities along the west option approach
 20 or exceed Pima County averages by as much as 6 percent, indicating there could be smaller
 21 neighborhood pockets of minority and low-income populations.

22 One of the other key differences between the Recommended and Preferred Alternatives is that
 23 the Preferred Alternative would avoid many impacts to the Buckeye, Goodyear, Palo Verde, and
 24 Tonopah communities.

25 **Table 3.5-3. Communities in the 2,000-foot-wide Corridor of the Preferred**
 26 **Alternative**

Geography	Community or Census Designated Places (% minority, % low-income)	Alignment Description
Nogales to Sahuarita	Nogales City CDP (96% , 26%) Rio Rico CDP (86% , 13%) Tumacácori-Carmen CDP (56% , 9%) Tubac CDP (23%, 10%) Amado CDP (51% , 0%) Arivaca Junction CDP (70% , 27%) Green Valley CDP (7%, 5%)	Co-located with existing I-19
Sahuarita to Marana: West Option in Pima County	Sahuarita CDP (40%, 5%) Ocotillo Ranches/CT 43.16 (42%, 16%) Three Points CDP (44%, 23%) Sandario Rd near SR 86/CT 44.24 (47% , 24%) Tucson Estates CDP (37%, 14%) Picture Rocks CDP (21%, 12%) Avra Valley CDP (28%, 18%)	New highway on new alignment



Geography	Community or Census Designated Places (% minority, % low-income)	Alignment Description
Sahuarita to Marana: East Option in Pima County	Sahuarita CDP (40%, 5%) Tohono O’odham Nation, San Xavier District (CT 9409: 88% , 29%) ^a South Tucson CDP (90% , 44%) Tucson CDP (53% , 23%) Flowing Wells (42% , 22%) Marana CDP (31%, 6%) ^a Casas Adobes CDP (29%, 9%) Rillito CDP (86% , 0%)	Co-located with existing I-19 and I-10
Marana to Casa Grande	Red Rock CDP (34%, 12%) ^a Eloy CDP (81% , 27%) Casa Grande CDP (50% , 15%)	New highway on new alignment
Casa Grande to Buckeye	Casa Grande CDP (50% , 15%) ^a Goodyear CDP (42% , 8%)	New Highway on new alignment
	Buckeye CDP (50% , 12%) ^a	Co-located with existing SR 85 and I-10
Buckeye to Wickenburg	Buckeye City CDP (50% , 12%) Congress CDP (14%, 9%)	New highway on a new alignment

- 1 SOURCE: US Census Bureau 2010, 2015a, and 2015b.
- 2 CT=census tract; CDP=census designated place; CDPs and CTs listed south to north
- 3 Detailed demographic tables can be found in Draft Tier 1 EIS **Appendix E5** (Demographic Data to Support the Title VI, Environmental Justice, and Limited English Proficiency Analysis).
- 4
- 5 Bold and underlined percentages are equal to or greater than demographics for the county in which they are located.
- 6 ^a The east option of the Preferred Alternative co-locates with I-19 through the San Xavier District of the Tohono O’odham Nation.

3.5.6 Mitigation and Tier 2 Analysis

3.5.6.1 Tier 2 Analysis Commitments

FHWA and ADOT completed a planning-level analysis for this Final Tier 1 EIS to support identification of a 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform (1) the selection of a specific alignment (approximately 400 feet wide) within the selected 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County. Tier 2 analysis will also identify measures to avoid, minimize, or mitigate impacts to community resources and environmental justice populations.

The Tier 2 analysis would be based on more specific corridor alignment information and design features, allowing a more precise evaluation of the impacts related to proposed displacements, relocations, changes to employment and businesses, community characteristics, and housing availability. Additional air quality, noise, and other environmental studies would be conducted to assess the potential human health impacts, both adverse and beneficial, to minority and low-income populations. Specifically, ADOT commits to carrying out the following analysis during the Tier 2 process:

- **T2-Community Resources, Title VI, and Environmental Justice-1:** Develop a Public Involvement Plan consistent with ADOT’s agency-wide Public Involvement Plan (ADOT



1 2017n), which meets federal requirements for Title VI, Environmental Justice, and LEP in
2 the transportation decision-making process. The public involvement plan will be developed
3 early in the planning process with the focus of ensuring full and fair participation by all
4 affected communities and populations. Coordination with local stakeholders and community
5 representatives may be needed to understand the unique needs and priorities of those
6 affected by the project, as well as determine the most effective means of engaging them in
7 the outreach process.

8 • **T2-Community Resources, Title VI, and Environmental Justice-2:** Identify and quantify
9 impacts and mitigation measures to address adverse impacts to minority and low-income
10 populations. Characterization of the demographics for affected communities would be
11 conducted using the most recent census data and supplemental characterization
12 techniques. The impact analysis would determine whether there are disproportionately high
13 and adverse effects to the minority and/or low-income populations.

14 • **T2-Community Resources, Title VI, and Environmental Justice-3:** Address
15 environmental justice in accordance with the principles outlined in EO 12898 and FHWA
16 Order 6640.23A (FHWA 2012a). The analysis should include the following items, as
17 established by the FHWA “Guidance on Environmental Justice and NEPA” (FHWA 2011a):

- 18 ○ Conduct major, proactive efforts to ensure meaningful opportunities for public
19 participation, including activities to increase participation from low-income and minority
20 populations.
- 21 ○ Compare the project effects (including indirect and cumulative effects) on minority and
22 low-income populations with respect to those on the overall population. Fair distribution
23 of the beneficial and adverse effects of the Project is the desired outcome.
- 24 ○ Determine whether the adverse effects are predominantly borne by the minority and low-
25 income populations or are appreciably more severe or greater in magnitude on these
26 populations than the adverse effects suffered by the non-minority and non-low-income
27 populations (i.e., disproportionately high and adverse effects).
- 28 ○ Determine whether the Project might prevent the denial of, reduction in, or significant
29 delay in the receipt of benefits by minority and low-income populations.
- 30 ○ Determine whether there are practicable mitigation measures or alignment alternatives
31 that would avoid or minimize the disproportionately high and adverse effect(s).
- 32 ○ Determine whether any of the affected communities include minorities, ethnic groups,
33 senior populations, persons with disabilities, individuals with a low-income, or those who
34 are LEP.

35 **3.5.6.2 Mitigation Commitments**

36 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
37 community resources, Title VI, and Environmental Justice population impacts from the Project
38 (generally referred to as mitigation measures) during this Tier 1 process.



1 Communities with minority and low-income populations were identified along the Recommended
2 and Preferred Alternatives.

3 **3.5.6.3 Additional Mitigation to be Evaluated in Tier 2**

4 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
5 above, to include best practices, permit requirements, and/or other mitigation strategies
6 suggested by agencies or the public. Examples of measures that ADOT may evaluate in Tier 2
7 include:

- 8 • Avoid community features or resources to the greatest extent practicable.
- 9 • Maintain function and access to existing community facilities.
- 10 • Provide offsetting benefits and opportunities to enhance communities, neighborhoods, and
11 individuals affected by the project.
- 12 • Build structures such as pedestrian overpasses to maintain existing neighborhood
13 connections.



1 **3.6 Economic Impacts**

2 **3.6.1 Summary of Draft Tier 1 EIS**

3 FHWA and ADOT used the Regional Economic Models, Inc. (REMI) TranSight model for the
4 State of Arizona (ADOT 2017o) to analyze regional economic changes in demand, income, and
5 employment as a result of the No Build and Build Corridor Alternatives. Changes in economic
6 activity would be triggered by (1) capital investment expenditures during the development phase
7 and (2) efficiencies gained from transportation improvements during the operational phase.
8 **Table 3.6-1** summarizes the economic impact analysis results for the three Build Corridor
9 Alternatives. The table shows the net change from the No Build Alternative (or baseline) for
10 each of the three Build Corridor Alternatives.

11 **Table 3.6-1. Summary of Potential Economic Impacts**

Economic Impact	Purple Alternative	Green Alternative	Orange Alternative
Development Phase (2020–2024)			
Gross Regional Product (\$ Billions)	\$8.9	\$8.7	\$3.9
Personal Income (\$ Billions)	\$5.7	\$5.6	\$2.5
Employment (Thousands of Job-Years)	106.4	104.5	46.8
Remainder of Analysis Period (2025–2044)			
Gross Regional Product (\$ Billions)	\$3.7	\$2.9	\$1.8
Personal Income (\$ Billions)	\$5.4	\$4.4	\$2.3
Employment (Thousands of Job-Years)	31.8	25.9	15.4
Total (2020–2044)			
Gross Regional Product (\$ Billions)	\$12.7	\$11.7	\$5.7
Personal Income (\$ Billions)	\$11.1	\$10.0	\$4.8
Employment (Thousands of Job-Years)	138.2	130.4	62.3
Employment Impact by County (2020–2044)			
Yavapai County (Thousands of Job-Years)	4.0	3.7	1.8
Maricopa County (Thousands of Job-Years)	105.0	98.9	47.3
Pinal County (Thousands of Job-Years)	6.8	6.4	3.0
Pima County (Thousands of Job-Years)	21.7	20.7	9.8
Santa Cruz County (Thousands of Job-Years)	0.8	0.7	0.4

12 Source: ADOT 2017o

13 ^a The estimates show the difference between the Build Corridor Alternatives and the No Build Alternative. The current economic
14 growth trends would be expected to continue under the No Build Alternative.

15
16 Of the three Build Corridor Alternatives, the Purple Alternative would generate the largest
17 increase to the gross regional product. The \$12.7 billion increase under the Purple Alternative
18 would be more than double the impact of the Orange Alternative, primarily due to initial
19 construction costs. This increase would be \$1.0 billion more than the impact of the Green



1 Alternative. Similarly, the Purple Alternative's impact on personal income (\$11.1 billion) is
2 expected to be more than twice the impact of the Orange Alternative and \$1.1 billion more than
3 the impact under the Green Alternative. The Purple Alternative is estimated to generate
4 138,200 job-years over the analysis period (2020 to 2024) compared to the Green Alternative at
5 130,400 job-years and the Orange Alternative at 62,300 job-years.

6 The Build Corridor Alternatives may open access and facilitate more people visiting parks and
7 other outdoor recreation destinations. Conversely, the Build Corridor Alternatives could deter
8 park visits and economic contributions from outdoor enthusiasts by reducing the rural character
9 of parks or diminishing the visitor experience. I-11 has the potential to provide better access and
10 opportunities for gateway services, such as lodging, that enhance tourism. The Build Corridor
11 Alternatives can help further the growth of outdoor tourism as an anchor of the local economy.

12 **3.6.2 Summary of Changes Since Draft Tier 1 EIS**

13 NPS requested that the economic benefit of Saguaro National Park be disclosed. NPS
14 estimates that nearly one million people visited the West and East units of Saguaro National
15 Park in 2017 and contributed \$88.7 million to the local economy (NPS 2018).

16 The City of Tucson expressed concerns about impacts on the City's economy because the
17 Recommended Alternative bypasses the City. The City was concerned that visitors who travel to
18 or pass through Tucson to shop would be diverted away from the City. This concern, along with
19 others, prompted FHWA and ADOT to include both the west option and east option in Pima
20 County as part of the Preferred Alternative to be evaluated in further detail in Tier 2.

21 **3.6.3 No Build Alternative**

22 Under the No Build Alternative, the Project would not be built. Maricopa County is, and will
23 remain, the largest economy in the Study Area. Its gross regional product is expected to
24 increase from \$251.6 billion to \$419.9 billion, or 67 percent, the most of any county, over the
25 analysis period. As a result, Maricopa County's share of gross regional product for the Study
26 Area would increase from 80 percent to 82 percent from 2020 to 2044. Employment also is
27 projected to grow to nearly three million in Maricopa County (ADOT 2017o).

28 Baseline employment in the Study Area is estimated at 3.3 million in 2020 and is expected to
29 increase by 12 percent from 2020 to 2044 to 3.7 million (or 0.48 percent per year on average).
30 Overall, the Study Area's economy is expected to add more than 400,000 jobs (ADOT 2017o).

31 **3.6.4 Recommended Alternative**

32 The Project Team anticipates the economic impacts for the Recommended Alternative would be
33 similar to the economic impacts for the Purple Alternative and Green Alternative presented in
34 **Section 3.6.4** (Environmental Consequences) of the Draft Tier 1 EIS. Construction costs for the
35 Recommended Alternative would increase slightly compared to the Purple Alternative and
36 Green Alternative (+3.7 percent and +5.6 percent), respectively (see **Chapter 6** [Recommended
37 Alternative] of the Draft Tier 1 EIS). **Figure 3.6-1** shows existing and emerging employment
38 clusters in relation to the Recommended and Preferred Alternatives.

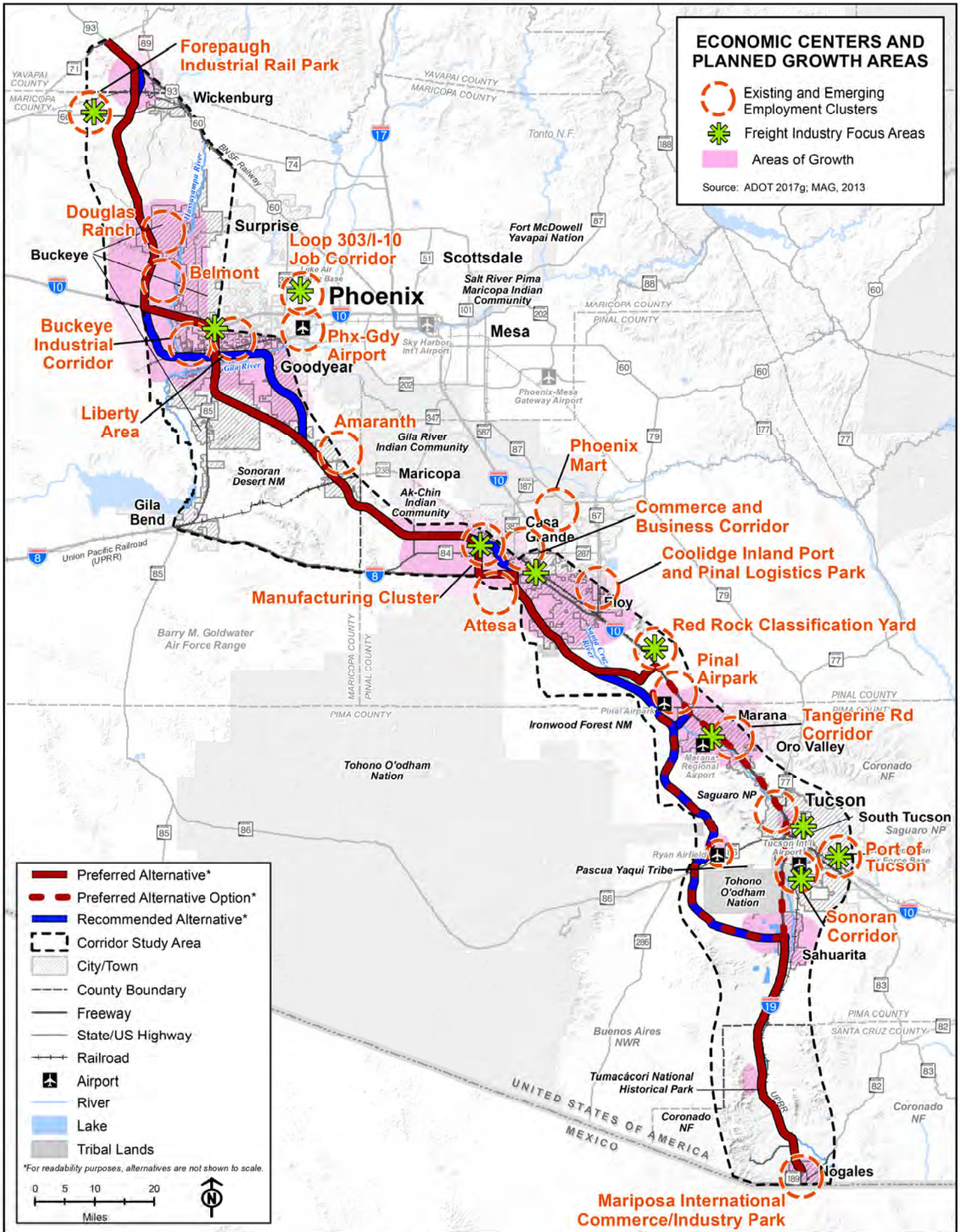


Figure 3.6-1. Updated Map of Key Economic Centers and Growth Areas in the I-11 Study Area



- 1 Anticipated economic impacts for the Recommended Alternative include:
- 2 • **Nogales to Sahuarita:** Two economic activity clusters include Mariposa International
3 Commerce Park and the planned commercial and resort development near Tubac. The
4 Recommended Alternative would continue to provide access to these two clusters.
 - 5 • **Sahuarita to Marana:** The Recommended Alternative would provide access to an emerging
6 employment center near Ryan Airfield. However, it would not provide access to existing
7 employment clusters of Port of Tucson, Sonoran Corridor, downtown Tucson, and the
8 Tangerine Road Commercial Corridor in Marana.
 - 9 • **Marana to Casa Grande:** The Recommended Alternative would encompass a growth area
10 that includes existing and emerging economic clusters of Pinal Airpark and the Red Rock
11 Classification Yard. The proposed connector between the Recommended Alternative and
12 I-10 would provide access to these existing and emerging employment clusters.
 - 13 • **Casa Grande to Buckeye:** A majority of this section of the Project corridor is identified as a
14 growth area with 10 existing and emerging employment clusters as shown on **Figure 3.6-1**,
15 starting with Coolidge Inland Port near Casa Grande to Liberty Area, and Buckeye Industrial
16 Corridor, Phoenix-Goodyear Airport, and Loop 303/I-10 Job Corridor in the
17 Buckeye/Goodyear area. The Recommended Alternative would pass through these
18 employment clusters, positively impacting access and connectivity.
 - 19 • **Buckeye to Wickenburg:** The Recommended Alternative runs north from I-10 through
20 Vulture Mine RMZ to Wickenburg. The Recommended Alternative would facilitate access
21 through two emerging employment clusters, Belmont and Douglas Ranch, and one existing
22 cluster, Forepaugh Industrial Rail Park.

23 **Table 3.6-2** summarizes and compares the economic impact analysis results for the
24 Recommended and Preferred Alternatives. The table shows the net change from the No Build
25 Alternative (or baseline) for each Build Corridor Alternative. Although ADOT's REMI TranSight
26 model was not re-run, the Project Team derived multipliers for the development and operational
27 phases in order to estimate the economic impacts. For the Recommended and Preferred
28 Alternatives, the project team also estimated these impacts based on cost summary data (2017
29 dollars).

30 The Recommended Alternative would generate the largest economic impacts. This increase
31 would be \$0.5 billion and \$2.5 billion more than the gross regional impacts of the Preferred
32 Alternative west and east options, respectively. The Recommended Alternative impact on
33 personal income (\$10.3 billion) is expected to be slightly higher than the impact of the Preferred
34 Alternative west option and \$1.8 billion more than the impact under the east option. The
35 Recommended Alternative is estimated to generate 136,200 job-years over the analysis period
36 (2020 to 2044) compared to the west option at 130,200 job-years and the east option at 106,700
37 job-years.



1 **Table 3.6-2. Summary of Potential Impacts on Economic Indicators for the 2,000-**
2 **foot-wide Corridors of the Recommended and Preferred Alternatives**

Metrics	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Development Phase (2020–2024)			
Gross Regional Product (\$ Billions)	\$9.2	\$8.6	\$6.9
Personal Income (\$ Billions)	\$5.9	\$5.5	\$4.4
Employment (Thousands of Job-Years)	110.4	102.9	82.5
Remainder of Analysis Period (2025–2044)			
Gross Regional Product (\$ Billions)	\$2.9	\$3.1	\$2.7
Personal Income (\$ Billions)	\$4.4	\$4.6	\$4.1
Employment (Thousands of Job-Years)	25.8	27.3	24.1
Total (2020–2044)			
Gross Regional Product (\$ Billions)	\$12.2	\$11.7	\$9.6
Personal Income (\$ Billions)	\$10.3	\$10.1	\$8.5
Employment (Thousands of Job-Years)	136.2	130.2	106.7
Employment Impact by County (2020–2044)			
Yavapai County (Thousands of Job-Years)	3.9	3.7	3.0
Maricopa County (Thousands of Job-Years)	103.3	98.8	81.0
Pinal County (Thousands of Job-Years)	6.6	6.4	5.2
Pima County (Thousands of Job-Years)	21.6	20.6	16.8
Santa Cruz County (Thousands of Job-Years)	0.8	0.7	0.6

3 Source: ADOT 2017o.

4 ^aThe estimates show the difference between the Recommended/Preferred Alternative and the No Build Alternative. The current
5 economic growth trends would be expected to continue under the No Build Alternative.

6 **3.6.5 Preferred Alternative**

7 Anticipated economic impacts for the Preferred Alternative include:

- 8 • **Nogales to Sahuarita:** The Preferred Alternative would continue to provide access to
9 Mariposa International Commerce Park and the planned commercial and resort
10 development near Tubac.
- 11 • **Sahuarita to Marana:** The Preferred Alternative with west option in Pima County would be a
12 new corridor west of Tucson and would provide access to an emerging employment center
13 near Ryan Airfield. However, it would not provide access to existing employment clusters of
14 Port of Tucson, Sonoran Corridor, downtown Tucson, and the Tangerine Road Commercial
15 Corridor in Marana. The Preferred Alternative with east option in Pima County would



- 1 continue to provide connectivity to these existing employment clusters. However, it would
2 not provide access to an emerging employment center near Ryan Airfield.
- 3 • **Marana to Casa Grande:** The Preferred Alternative would serve the same existing and
4 employment clusters as the Recommended Alternative.
- 5 • **Casa Grande to Buckeye:** The Preferred Alternative would serve most of the existing and
6 emerging employment clusters as the Recommended Alternative; however, because it is
7 farther south of the Recommended Alternative it would not provide direct access to the Loop
8 303/I-10 Job Corridor and the Phoenix-Goodyear Airport.
- 9 • **Buckeye to Wickenburg:** The Preferred Alternative would serve the same existing and
10 employment clusters as the Recommended Alternative.

11 3.6.6 Mitigation and Tier 2 Analysis

12 3.6.6.1 Tier 2 Analysis Commitments

13 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
14 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
15 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
16 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
17 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate economic impacts.
18 Specifically, ADOT commits to carrying out the following analysis during the Tier 2 process:

- 19 • **T2-Economic-1:** Use an updated travel demand model that delineates population and
20 employment projections combined with an assessment of planned/entitled private
21 developments to determine locations most suitable for ensuring transportation system safety
22 and mobility.
- 23 • **T2-Economic-2:** Use a more detailed alignment to analyze impacts related to businesses
24 (including loss of access).
- 25 • **T2-Economic-3:** Evaluate impacts on outdoor recreation and the overall regional economy
26 by using recent, relevant outdoor recreation data such as the Outdoor Recreation Satellite
27 Accounts. The Outdoor Recreation Satellite Accounts use tracker surveys to collect
28 information on visitor spending, on attractions that generate tourist visits, and on how the
29 alternatives might affect tourists' decisions.

30 3.6.6.2 Mitigation Commitments

31 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
32 economic impacts from the Project (generally referred to as mitigation measures) during this
33 Tier 1 process. Specific mitigation that ADOT is committing to implement if a Build Alternative is
34 selected includes:

- 35 • **MM-Economic-1:** Locate traffic interchanges to provide transportation access to state lands
36 and other developable areas while balancing convenient access with potential impacts on
37 parks and outdoor tourism destinations as a result of the added interchanges.



- 1 • **MM-Economic-2:** Participate in continued, long-term planning efforts with metropolitan
2 planning organizations, local jurisdictions, resource agencies, and private stakeholders to
3 cooperatively plan development along the I-11 corridor. The effort would coordinate wildlife
4 connectivity, local land use planning, and context sensitive design for the I-11 facility. Details
5 regarding long-term planning efforts are dependent on the planning process for each
6 individual organization, jurisdiction, and/or agency. ADOT commits to participating in these
7 efforts but does not have the jurisdiction to lead them (MM-Indirect-1).

8 **3.6.6.3 Additional Mitigation to be Evaluated in Tier 2**

9 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
10 above, to include best practices, permit requirements, and/or other mitigation strategies
11 suggested by agencies or the public. Examples of measures that ADOT may evaluate in Tier 2
12 include:

- 13 • Coordinate with local municipalities to revise county comprehensive and municipal general
14 plans, zoning ordinances, and capital improvement programs to support the corridor as
15 needed.
- 16 • Coordinate with local and state entities to assist in adopting financing tools and strategies
17 targeted to increase investment and job creation along the corridor.
- 18 • Coordinate with local and state entities to assist in implementing business attraction
19 strategies and efforts to target desirable economic sector development along the corridor.
- 20 • Prepare for and fund infrastructure improvements to planned industrial and business parks
21 along the corridor in coordination with local municipalities.
- 22 • Coordinate with local municipalities to adopt zoning strategies that support and encourage
23 recreation compatibility and wildlife connectivity to support mitigation in the Tier 1 Record of
24 Decision.



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1 **3.7 Archaeological, Historical, Architectural, and Cultural**
2 **Resources**

3 **3.7.1 Summary of Draft Tier 1 EIS**

4 The Draft Tier 1 EIS assessed potential impacts on archaeological, historical, architectural, and
5 cultural resources, and FHWA initiated consultation pursuant to Section 106 of the National
6 Historic Preservation Act (NHPA). Because planning of I-11 is phased, FHWA and ADOT
7 adopted a phased approach for assessing I-11 effects on properties listed in or eligible for the
8 National Register of Historic Places (NRHP), a strategy consistent with Section 106 regulations.
9 The Draft Tier 1 EIS assessed levels of impacts on (1) archaeological sites and historic
10 structures, (2) historic districts and buildings, and (3) traditional cultural properties. The analysis
11 was based on (1) tribal consultation, (2) prior cultural resource studies and NRHP listing and
12 evaluations, and (3) preliminary evaluations of the NRHP eligibility of unrecorded historic-period
13 parcels (defined as pre-1971).

14 The NHPA defines historic properties as cultural resources that are “included in, or eligible for
15 inclusion in” the NRHP (36 CFR 800.16(l)(1)). Eligibility is determined by federal lead agencies
16 during the Section 106 process. For this Tier 1 study, information from prior eligibility
17 evaluations was used; no re-evaluation of prior recommendations or determinations was
18 undertaken. The Tier 1 preliminary NRHP evaluations of unrecorded historic-period districts and
19 buildings were an initial assessment limited to consideration of historic integrity and architectural
20 significance and are not formal NRHP eligibility recommendations but instead an indication of
21 resources that might be protected by Section 4(f). Tier 2 studies will evaluate the eligibility of
22 previously recorded and newly recorded cultural resources.

23 Prior cultural resource surveys covered about one-fourth to one-half of the three Build Corridor
24 Alternatives. Archaeological sites are the most common type of cultural resource recorded in the
25 study area, and approximately 65 percent are prehistoric, 20 percent are historic, 10 percent
26 have both prehistoric and historic components, and 5 percent are undated. The sites reflect
27 prehistoric and historic settlements and a variety of non-habitation activities. Historic structures
28 (such as roads and irrigation canals) are less common.

29 Three archaeological resources and 10 historic districts or buildings listed in the NRHP, and one
30 historic district previously evaluated as eligible, overlap the three Build Corridor Alternatives.
31 Prior reviews evaluated the NRHP eligibility of 65 to 75 percent of the other recorded
32 archaeological sites and historic structures and found 60 to 70 percent to be eligible. Preliminary
33 evaluation of unrecorded pre-1971 parcels concluded 38 (4 districts, 34 individual parcels) were
34 likely eligible and 65 (2 districts, 63 individual parcels) were possibly eligible. The Draft Tier 1
35 EIS assessment concluded each Build Corridor Alternative could affect one or two known
36 traditional cultural properties (**Table 3.7-1**).

37 Because any build alternative could adversely affect NRHP-listed or eligible properties, FHWA
38 and ADOT prepared a Section 106 Programmatic Agreement to define procedures for further
39 consideration during Tier 2. A Draft Programmatic Agreement was circulated to consulting
40 parties and included in the Draft Tier 1 EIS **Appendix E7** (Section 106 Consultation Summary
41 and Draft Programmatic Agreement). The final draft Tier 1 Section 106 programmatic
42 agreement (PA) was distributed to consulting parties on May 5, 2021, for final review and



1 comment. Consultation is ongoing. The final draft PA, included in this Final Tier 1 EIS in
 2 **Appendix E7** (Section 106 Consultation Summary and Programmatic Agreement), reflects
 3 Section 106 consultation to date. If the PA is not executed before the Tier 1 EIS Record of
 4 Decision is issued, it may be executed subsequently. Construction on Tier 2 projects would not
 5 proceed until appropriate Section 106 agreement documents are executed.

6 **Table 3.7-1. Summary of Draft Tier 1 EIS Assessment of Impacts on Cultural**
 7 **Resources**

Assessment	Purple Alternative	Green Alternative	Orange Alternative
Archaeological Sites and Historic Structures			
Percent covered by previous cultural resource surveys	27%	25%	49%
Potential high impacts	4 miles	8 miles	25 miles
Potential moderate impacts	45 miles	52 miles	20 miles
Potential low impacts	143 miles	155 miles	64 miles
No impacts anticipated	80 miles	53 miles	171 miles
Estimated NRHP-eligible properties affected	70	100	60
Historic Districts and Buildings			
Potential high impacts on NRHP-listed/determined eligible properties	0	0	4
No impacts anticipated on NRHP-listed properties	1	2	7
Potential high impacts on unrecorded historic-period parcels preliminarily evaluated as likely or possibly NRHP eligible	1	0	5
Potential moderate impacts on unrecorded historic-period parcels preliminarily evaluated as likely or possibly NRHP eligible	3	3	0
Potential low impacts on unrecorded historic-period parcels preliminarily evaluated as likely or possibly NRHP eligible	25	18	2
No impacts anticipated on unrecorded historic-period parcels preliminarily evaluated as likely or possibly NRHP eligible	30	35	48
Traditional Cultural Properties			
Potentially affected	2	2	1

8 SOURCE: ADOT 2018a, 2018b; ADOT 2017j (Record of FHWA, ADOT, and Four Southern Tribes cultural resource meeting, June
 9 27, 2017).

10 **3.7.2 Summary of Changes Since Draft Tier 1 EIS**

11 Some comments on the Draft Tier 1 EIS questioned the adequacy of data used to assess
 12 potential impacts on cultural resources, particularly for comparison of impacts of the Green and
 13 Orange Alternatives in Pima County. Because of that and other reasons, FHWA and ADOT
 14 concluded more detailed studies are needed to understand trade-offs between those
 15 alternatives and retained both options as part of the Preferred Alternative for further study
 16 during Tier 2. FHWA and ADOT concluded the analysis provided information needed to

1 adequately consider potential impacts on cultural resources for Tier 1 decisions. After the Draft
2 Tier 1 EIS was issued, the Project Team used the Draft Tier 1 EIS methods to collect additional
3 data to characterize cultural resources and assess potential levels of impacts for those parts of
4 the Recommended and Preferred Alternatives that differed from the originally assessed Build
5 Corridor Alternatives.

6 **3.7.3 No Build Alternative**

7 The No Build Alternative would avoid most impacts on cultural resources in the Build Corridor
8 Alternatives, but not all because some highway improvement projects programmed for funding
9 would be constructed even if FHWA and ADOT decided not to pursue development of I-11 (see
10 Draft Tier 1 EIS **Section 2.3.1** [No Build Alternative]). The Draft Tier 1 EIS concluded such
11 projects would result in potential high impacts along 2 miles of I-10 in the Tucson vicinity, and
12 those projects are now underway. Other projects not yet designed or funded would be
13 developed in the future and could affect additional cultural resources, but each would be
14 reviewed pursuant to applicable regulations.

15 **3.7.4 Recommended Alternative**

16 **3.7.4.1 Archaeological Sites and Historic Structures**

17 Prior cultural resource surveys covered 23 percent of the Recommended Alternative and
18 recorded 172 archaeological sites and 46 historic structures (**Table 3.7-2**). Approximately
19 78 percent of the archaeological sites are prehistoric, 12 percent are historic, 8 percent have
20 both prehistoric and historic components, and 2 percent are of undetermined age (**Table 3.7-3**).
21 Artifact scatters, with or without archaeological features, are the most common type of known
22 prehistoric site (83 percent), and 16 percent are classified as village or habitation sites. A less
23 common type is trails.

24 The most common types of known historic archaeological sites are artifact scatters, with or
25 without archaeological features (50 percent). Approximately 30 percent of the known historic
26 sites are classified as reflecting more permanent occupation (homesteads, habitations, and
27 building foundations). Less common types are classified as ranching and military. The most
28 common types of known historic structures are roads (73 percent), railroads (9 percent), and
29 irrigation canals (9 percent). Less common types include utility lines and cemeteries.

30 As was done for the Draft Tier 1 EIS, the Project Team assessed the potential for unrecorded
31 archaeological sites and historic structures in parts of the Recommended Alternative that have
32 had little prior survey for cultural resources. The analysis classified 13 areas encompassing
33 5.3 miles of the Recommended Alternative as having high potential for unrecorded
34 archaeological sites. The average recorded densities suggest there could be approximately
35 900 to 1,000 archaeological sites and historic structures in the 2,000-foot-wide corridor.

36 One NRHP-listed archaeological district (Los Robles District) overlaps the edge of the
37 Recommended Alternative in three locations, but no archaeological sites have been recorded in
38 those overlaps. Although not listed in the NRHP, nine known historic structures may warrant
39 efforts to preserve in place because they were previously determined to be eligible for the
40 NRHP under Criteria A, B, or C, in addition to, or rather than their potential to yield important
41 information (Criterion D) (**Table 3.7-4**). Any adverse effects at existing or new crossings of those



1 historic structures might be avoided by bridging or other measures, as ADOT has done on other
 2 projects.

3 **Table 3.7-2. Extent of Prior Cultural Resource Survey and Recorded**
 4 **Archaeological Sites and Historic Structures in the 2,000-foot-wide Corridors of**
 5 **the Recommended and Preferred Alternatives**

Summary of Prior Cultural Resource Surveys	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Length (miles)	276.1	276.0	267.8
Percent Previously Surveyed	23.4%	28.3%	39.2%
Recorded Archaeological Sites	172	200	350
Recorded Historic Structures	46	57	87
Total ^a	218	257	437
Average Density of Recorded Resources/Mile ^b	3.4	3.3	4.2
Estimated Total Resources ^c	891	965	1,062

6 SOURCE: ADOT 2020a.

7 Note: Table includes all recorded sites and historic structures regardless of NRHP eligibility.

8 ^a Each of the options (segments) included in the Recommended and Preferred Alternatives was analyzed separately. Because some
 9 archaeological sites and historic structures overlapped option boundaries, they were counted more than once when the numbers for
 10 each option were summed, which inflated the totals. The actual total number of archaeological sites and historic structures recorded
 11 along the Recommended Alternative is 215, along the Preferred Alternative with west option in Pima County is 246, and along the
 12 Preferred Alternative with the east option is 421.

13 ^b Per linear mile of 2,000-foot-wide corridor within areas surveyed for cultural resources.

14 ^c Estimates are the sum of estimates based on the recorded densities for each option (segment) of the alternative.

15

16 **Table 3.7-3. Temporal Classification of Recorded Archaeological Sites and**
 17 **Historic Structures in the 2,000-foot-wide Corridors of the Recommended and**
 18 **Preferred Alternatives**

Temporal Period	Recommended Alternative		Preferred Alternative with West Option in Pima County		Preferred Alternative with East Option in Pima County	
	Sites	%	Sites	%	Sites	%
Archaeological Sites: Prehistoric	132	61%	144	59%	196	47%
Archaeological Sites: Historic	20	9%	30	12%	78	19%
Archaeological Sites: Multi-component	14	7%	13	5%	47	11%
Archaeological Sites: Undated	4	2%	10	4%	26	6%
Archaeological Sites Subtotal	170	79%	197	80%	347	83%
Historic Structures	45	21%	49	20%	73	17%
Total	215	100%	246	100%	420	100%

19 SOURCE: ADOT 2020a.

20 Note: Table includes all recorded archaeological sites and historic structures identified by the data collection regardless of NRHP
 21 eligibility.



1 **Table 3.7-4. Archaeological Sites and Historic Structures that may Warrant**
 2 **Preservation in Place in the 2,000-foot-wide Corridors of the Recommended and**
 3 **Preferred Alternatives**

Archaeological Site/ Historic Structure	NRHP Eligibility Criteria	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Archaeological Sites				
Site AZ BB:13:170(ASM)	A, B, D	–	–	no impact ^a
Site AZ T:10:59(ASM)	A, C, D	–	no impact ^b	no impact ^b
Historic Structures				
Otero Cemetery	A, B	no impact ^c	no impact ^c	no impact ^c
New Mexico & Arizona Railroad: Nogales Branch	C	no impact ^c	no impact ^c	no impact ^c
Mission de San Agustin del Tucson /Clearwater site	A, D	–	–	no impact ^d
Cortaro Farms Canal	A	adverse effect unlikely ^e	–	adverse effect unlikely ^f
Abandoned Cortaro-Marana Irrigation District canals	A, C	–	–	adverse effect unlikely ^f
Arizona Southern Railroad	A, D	adverse effect unlikely ^e	adverse effect unlikely ^e	adverse effect unlikely ^e
Casa Grande Canal	A	adverse effect unlikely ^e	–	–
Southern Pacific Railroad	A	adverse effect unlikely ^e	adverse effect unlikely ^e	adverse effect unlikely ^e
Butterfield Overland Mail stage route	A	adverse effect unlikely ^e	adverse effect unlikely ^e	adverse effect unlikely ^e
Buckeye Canal	A	adverse effect unlikely ^e	adverse effect unlikely ^g	adverse effect unlikely ^g
Southern Pacific Railroad- Phoenix Mainline	A	adverse effect unlikely ^e	adverse effect unlikely ^g	adverse effect unlikely ^g
Roosevelt Canal	A	–	adverse effect unlikely ^g	adverse effect unlikely ^g

4 SOURCE: ADOT 2020a.

5 ^a Outside right-of-way of co-located I-19, where new lanes would be added in existing right-of-way.

6 ^b Co-located with SR 85 where no lanes would be added.

7 ^c Co-located with I-19 where no lanes would be added.

8 ^d Co-located with I-10 outside potential new right-of-way.

9 ^e Any adverse effect at new crossing might be avoided by bridging, as ADOT has done on other projects.

10 ^f Any adverse effect at existing crossing of co-located I-10 might be avoided by bridging, as ADOT has done on other projects.

11 ^g Any adverse effect at existing crossing of co-located SR 85 might be avoided by bridging, as ADOT has done on other projects.

12
13

1 Prior reviews evaluated 129 of the 215 archaeological and historic structures recorded in the
 2 Recommended Alternative and determined or recommended 67 percent eligible for the NRHP
 3 (**Table 3.7-5**). The Final Tier 1 EIS assessment concluded the Recommended Alternative could
 4 have high impacts for approximately 8 miles and moderate impacts for 61 miles and could affect
 5 approximately 100 NRHP-eligible sites and historic structures.

6 **Table 3.7-5. NRHP Eligibility of Archaeological Sites and Historic Structures in the**
 7 **2,000-foot-wide Corridors of the Recommended and Preferred Alternatives**

NRHP Eligibility of Recorded Sites and Historic Structures	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Percent surveyed for cultural resources	23%	28%	39%
Eligible under Criterion D	58	65	129
Eligible under Criteria A, B, and/or C	10	9	14
Eligible, no criterion listed	18	18	43
Total Eligible ^a	86	92	186
Not Eligible ^b	43	54	94
Percent Evaluated as Eligible	67%	63%	66%
Not Evaluated	86	100	140

8 SOURCE: ADOT 2020a.

9 ^a Includes resources that have been determined to be NRHP eligible or recommended eligible.

10 ^b Includes resources that have been determined to not be NRHP eligible or recommended not eligible.

11 **3.7.4.2 Historic Districts and Buildings**

12 Two NRHP-listed historic districts overlap the part of the Recommended Alternative co-located
 13 with I-19 but are unlikely to be adversely affected (**Table 3.7-6**). The recently nominated Tucson
 14 Mountain Park Historic District does not overlap the Recommended Alternative but is within
 15 approximately 200 feet at its closest point and on the opposite side of the Tucson Aqueduct of
 16 the CAP. Preliminary evaluation of 144 unrecorded historic-period properties (8 districts, 136
 17 individual properties) along the Recommended Alternative concluded 24 were likely NRHP
 18 eligible, 42 possibly eligible, and 78 not eligible (**Table 3.7-7**). The Final Tier 1 EIS assessment
 19 concluded the Recommended Alternative is unlikely to have high impacts on any of those
 20 preliminarily evaluated as likely or possibly eligible properties and potential moderate impacts
 21 on four of them.

22 **3.7.4.3 Traditional Cultural Properties**

23 In consultation with FHWA and ADOT, tribes identified four traditional cultural properties along
 24 the Recommended Alternative. Specific locations of two of those were not revealed and they
 25 could be directly affected (**Table 3.7-8**). The two others are not close to the corridor, but
 26 potential for indirect effects would be considering during Tier 2, if warranted. Tribes also oppose
 27 disturbance of human burials and formal animal burials.



1 **Table 3.7-6. NRHP-listed and Determined Eligible Historic Districts and Buildings**
 2 **in the 2,000-foot-wide Corridors of the Recommended and Preferred Alternatives**

NRHP Eligible or Listed Historic Property	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Tumacácori National Historical Park	co-located with I-19	co-located with I-19	co-located with I-19
Canoa Ranch Rural Historic District	co-located with I-19	co-located with I-19	co-located with I-19
El Paso and Southwestern Railroad District	–	–	co-located with I-10 ^a
Barrio El Hoyo Historic District	–	–	co-located with I-10
Barrio El Membrillo Historic District	–	–	co-located with I-10 ^a
El Presidio Historic District	–	–	co-located with I-10
Manning, Levi H. House (noncontiguous contributor to El Presidio Historic District)	–	–	co-located with I-10 ^a
Barrio Anita Historic District ^a	–	–	co-located with I-10 ^a
Menlo Park Historic District	–	–	co-located with I-10
Ronstadt-Sims Adobe Warehouse (noncontiguous contributor to John Spring Neighborhood Historic District)	–	–	co-located with I-10
US Department of Agriculture Tucson Plant Materials Center	–	–	co-located with I-10

3 SOURCE: ADOT 2020b
 4 Note: All properties are NRHP-listed except for the El Paso and Southwestern Railroad District, which has been determined eligible.
 5 ^a Could be directly affected if additional right-of-way is required for I-10 upgrades between the I-19 interchange and Prince Road. No
 6 impacts are anticipated on other NRHP listed properties.

7 **Table 3.7-7. Preliminary NRHP Eligibility Evaluations of Unrecorded Historic-**
 8 **Period Properties in the 2,000-foot-wide Corridors of the Recommended and**
 9 **Preferred Alternatives**

Preliminary Evaluations of Unrecorded Historic-Period Properties and Impact Assessment	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Districts			
Likely Eligible	4	4	4
Possibly Eligible	3	2	1
Not Eligible	1	1	9
Individual Properties			
Likely Eligible	20	18	24
Possibly Eligible	39	41	39
Not Eligible	77	55	92
Totals	144	121	169



Preliminary Evaluations of Unrecorded Historic-Period Properties and Impact Assessment	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Potential Level of Impacts ^a			
High	0	0	5
Moderate	4	3	0
Low	27	26	16
None Anticipated	35	36	47

1 SOURCE: ADOT 2020a
 2 ^a On properties preliminarily evaluated as likely or possibly eligible for the NRHP.

3 **Table 3.7-8. Traditional Cultural Properties in the 2,000-foot-wide Corridors of the**
 4 **Recommended and Preferred Alternatives**

Traditional Cultural Property	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Site associated with a traditional tribal story	Location not revealed, could be affected in new corridor	Location not revealed, could be affected in new corridor	–
Archaeological site	Location not revealed, could be affected in new corridor	Location not revealed, could be affected in new corridor	Location not revealed, could be affected in new corridor
Area of high archaeological site density	–	–	Along I-19, could be affected along existing right-of-way
Volcanic peak	Not close to corridor, unlikely to be directly affected	Not close to corridor, unlikely to be directly affected	Not close to corridor, unlikely to be directly affected
Cluster of volcanic hills	Not close to corridor, unlikely to be directly affected	Not close to corridor, unlikely to be directly affected	Not close to corridor, unlikely to be directly affected
Open air chapel	–	–	Along I-19, unlikely to be directly affected

5 SOURCE: ADOT 2017j (Record of FHWA, ADOT, and Four Southern Tribes cultural resource meeting, June 27, 2017); Pascua
 6 Yaqui Tribe 2020.

7 **3.7.5 Preferred Alternative**

8 **3.7.5.1 Archaeological Sites and Historic Structures**

9 Prior cultural resource surveys covered 28 percent of the Preferred Alternative with west option
 10 in Pima County and 39 percent of the Preferred Alternative with east option in Pima County,
 11 recording 257 and 436 archaeological sites and historic structures in those respective corridors
 12 (Table 3.7-2). A majority of recorded archaeological sites date to the prehistoric era, others date



1 to the historic period, some have both prehistoric and historic components, and a few are
2 undated (**Table 3.7-3**).

3 Artifact scatters, with or without features, are the most common type of known prehistoric sites
4 in both options of the Preferred Alternative (77 to 81 percent), and 15 to 17 percent are
5 classified as village or habitation sites. Other types include rock features, canals, trails, and
6 cleared areas.

7 The most common type of known historic archaeological sites in both options of the Preferred
8 Alternative also are artifact scatters, with or without archaeological features (44 to 63 percent).
9 Approximately 17 percent of the known historic sites in the Preferred Alternative with west
10 option in Pima County reflect more permanent occupation (homesteads, habitations, or building
11 foundations). The Preferred Alternative with east option has considerably more, including entire
12 city blocks (39 percent). Other sites are classified as ranching, military, agricultural, and mining.
13 The most common types of known historic structures in both options are roads (62 to
14 73 percent), railroads (8 to 12 percent), and irrigation canals (8 to 14 percent). Other types
15 include utilities and cemeteries.

16 As was done for the Draft Tier 1 EIS, the Project Team assessed the potential for unrecorded
17 archaeological sites and historic structures in parts of the Preferred Alternative that have had
18 little prior survey for cultural resources. The analysis classified five areas, totaling 4.2 miles, as
19 having high potential for unrecorded archaeological sites and historic structures along the
20 Preferred Alternative with west option in Pima County and 14 areas, totaling 6.7 miles, with the
21 east option. The average recorded densities suggest there could be approximately 900 to 1,000
22 archaeological sites and historic structures in the 2,000-foot-wide corridor of the west option and
23 1,000 to 1,100 in the east option.

24 No archaeological sites in the Preferred Alternative with west option in Pima County are listed in
25 the NRHP. One archaeological site, AZ BB:15:13(ASM), in the Preferred Alternative with east
26 option is listed in the NRHP. The site is along a segment co-located with I-19.

27 Although not listed in the NRHP, one known archaeological site and eight known historic
28 structures in the Preferred Alternative with west option in Pima County were previously
29 determined to be eligible for the NRHP under Criteria A, B, or C, in addition to, or rather than
30 their potential to yield important information (Criterion D) (**Table 3.7-4**). Two archaeological sites
31 and 11 historic structures were previously determined to be eligible for the NRHP under Criteria
32 A, B, or C in the Preferred Alternative with east option. Those resources may warrant efforts to
33 preserve in place. Bridging or other measures have good potential to avoid any adverse effects
34 on those archaeological sites and historic structures, as ADOT has done on other projects.

35 Prior reviews evaluated 146 of the 246 archaeological sites and historic structures recorded in
36 the Preferred Alternative with west option in Pima County and determined or recommended
37 63 percent eligible for the NRHP. Prior reviews evaluated 280 of the 420 archaeological sites
38 and historic structures recorded in the Preferred Alternative with east option and determined or
39 recommended 66 percent eligible for the NRHP (**Table 3.7-5**).

40 The Final Tier 1 EIS assessment concluded the Preferred Alternative with west option in Pima
41 County could have high impacts for approximately 6 miles and moderate impacts for 59 miles
42 and affect approximately 110 NRHP-eligible sites and historic structures. The Final Tier 1 EIS
43 assessment concluded the Preferred Alternative with east option in Pima County could have



1 high impacts for approximately 34 miles, moderate impacts for 42 miles, and affect
2 approximately 70 NRHP-eligible sites and historic structures.

3 3.7.5.2 Historic Districts and Buildings

4 Two NRHP-listed historic districts overlap the part of the Preferred Alternative that is co-located
5 with I-19 but are unlikely to be affected. The recently nominated Tucson Mountain Park Historic
6 District does not overlap the Preferred Alternative with west option but is within approximately
7 200 feet at its closest point and on the opposite side of the Tucson Aqueduct of the CAP
8 Although that historic district would not be directly affected, potential indirect effects would need
9 to be considered during Tier 2. Eight other NRHP-listed historic districts and buildings and one
10 eligible historic district overlap the Preferred Alternative with east option in Pima County, and
11 four of those could be directly affected if the I-10 right-of-way has to be widened to
12 accommodate additional lanes between the I-19 interchange and Prince Road (**Table 3.7-6**).

13 Preliminary evaluation of 121 unrecorded historic-period properties (7 districts, 114 individual
14 properties) along the Preferred Alternative with west option in Pima County concluded 22 were
15 likely eligible, 43 possibly eligible, and 56 not eligible. Preliminary evaluation of 169 unrecorded
16 historic-period properties (14 districts, 155 individual properties) along the Preferred Alternative
17 with east option concluded 28 were likely eligible, 40 possibly eligible, and 101 not eligible. The
18 impact analysis concluded the west option was unlikely to have high impacts on any unrecorded
19 historic-period properties preliminarily evaluated as likely or possibly eligible, and potential
20 moderate impacts on three. The Final Tier 1 EIS assessment concluded the east option could
21 have potential high impacts on five unrecorded historic-period properties preliminarily evaluated
22 as likely or possibly eligible and moderate impacts on none (**Table 3.7-7**).

23 3.7.5.3 Traditional Cultural Properties

24 In consultation with FHWA and ADOT, tribes identified four traditional cultural properties that
25 could be affected along the Preferred Alternative with west option in Pima County (**Table 3.7-8**).
26 Specific locations of two of those were not revealed and they could be directly affected. The two
27 others are not close to the corridor, but potential for indirect effects would be considering during
28 Tier 2, if warranted. Tribes identified five traditional cultural properties that could be affected
29 along the Preferred Alternative with east option. Two are along I-19 where a need for additional
30 right-of-way is not anticipated but one could be affected by construction of additional lanes in
31 the existing right-of-way. The specific location of another was not revealed and it could be
32 directly affected. The two others are not close to the corridor, but potential for indirect effects
33 would be considering during Tier 2, if warranted. Tribes also oppose disturbance of human
34 burials and formal animal burials.

35 3.7.5.4 Summary

36 The Final Tier 1 EIS impact assessment concluded that, compared to the Recommended
37 Alternative and the Preferred Alternative with west option in Pima County, the Preferred
38 Alternative with east option in Pima County is likely to:

- 39 • Pass through a high-density area of archaeological sites in the Tucson area but affect
40 approximately 30 to 40 fewer NRHP-eligible archaeological sites and historic structures



- 1 • Potentially have high impacts on 4 NRHP-listed or eligible historic districts and buildings and
- 2 5 preliminarily evaluated as likely or possibly eligible
- 3 • Affect the same number of tribally identified traditional cultural properties (**Table 3.7-9,**
- 4 **Figure 3.7-1,** and **Figure 3.7-2**)

**Table 3.7-9. Summary of Comparison of Impacts on Cultural Resources:
 Recommended and Preferred Alternatives**

Assessment	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Archaeological Sites and Historic Structures			
Percent covered by previous cultural resource surveys	23%	28%	39%
Potential high impacts	7.8 miles	6.3 miles	34.4 miles
Potential moderate impacts	60.6 miles	59.4 miles	41.5 miles
Potential low impacts	159.6 miles	152.6 miles	124.2 miles
No impacts anticipated	48.1 miles	57.7 miles	67.7 miles
Estimated NRHP-eligible properties affected	100	110	70
Historic Districts and Buildings			
Potential high impacts on NRHP-listed or determined eligible properties	0	0	4
No direct impacts anticipated on NRHP-listed properties	2 ^a	2 ^a	7
Potential high impacts on unrecorded historic-period parcels preliminarily evaluated as likely or possibly NRHP eligible	0	0	5
Potential moderate impacts on unrecorded historic-period parcels preliminarily evaluated as likely or possibly NRHP eligible	4	3	0
Potential low impacts on unrecorded historic-period parcels preliminarily evaluated as likely or possibly NRHP eligible	27	26	16
No impacts anticipated on unrecorded historic-period parcels preliminarily evaluated as likely or possibly NRHP eligible	35	36	47
Traditional Cultural Properties			
Potentially directly affected	2	2	2

7 SOURCE: ADOT 2020a, 2020b

8 ^a In addition to the two NRHP-listed properties, the recently nominated Tucson Mountain Park Historic District is near but does not
 9 overlap the corridor. Potential indirect effects would be assessed during Tier 2.

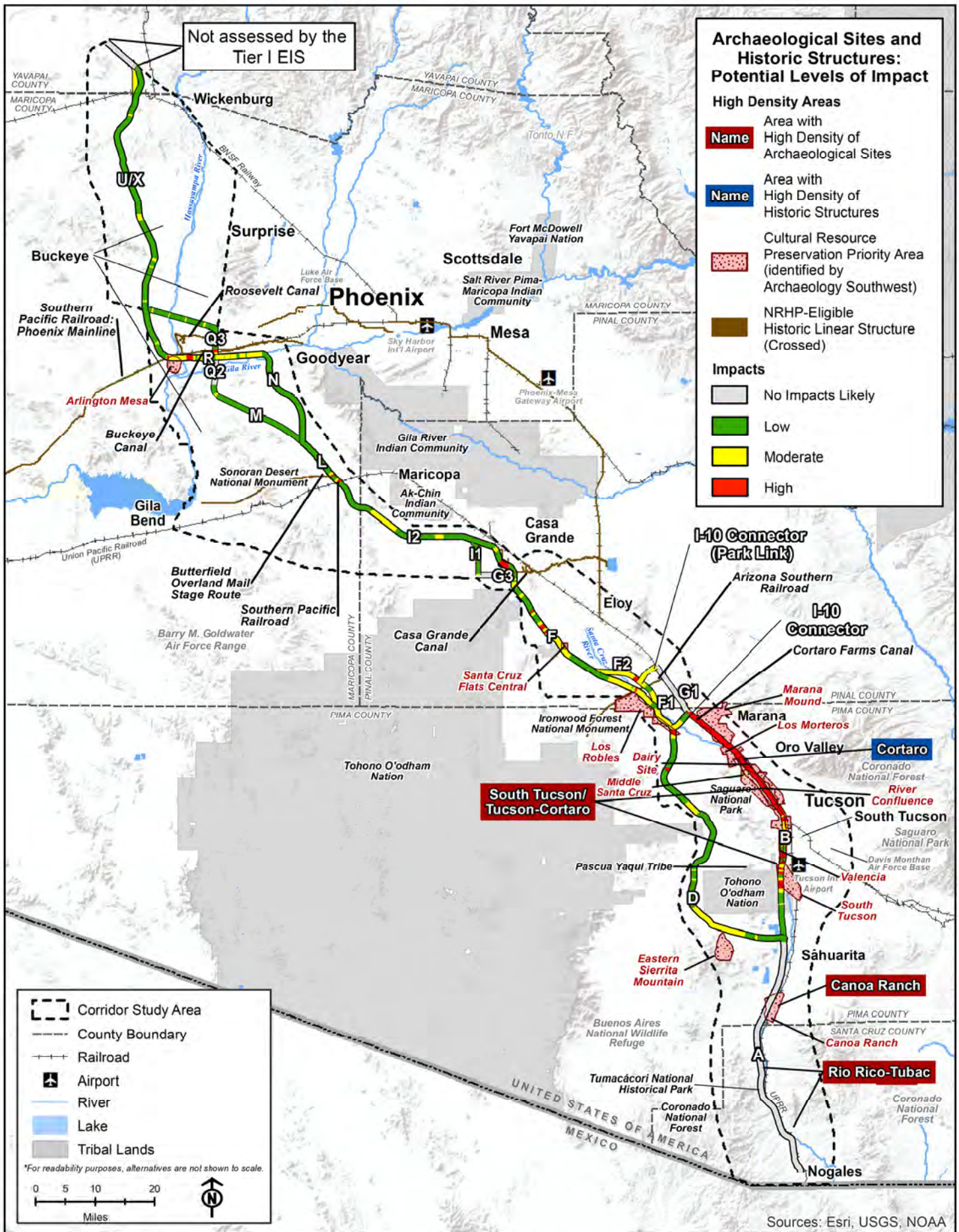


Figure 3.7-1 Potential Levels of Impact on Archaeological Sites and Historic Structures in the Recommended and Preferred Alternatives

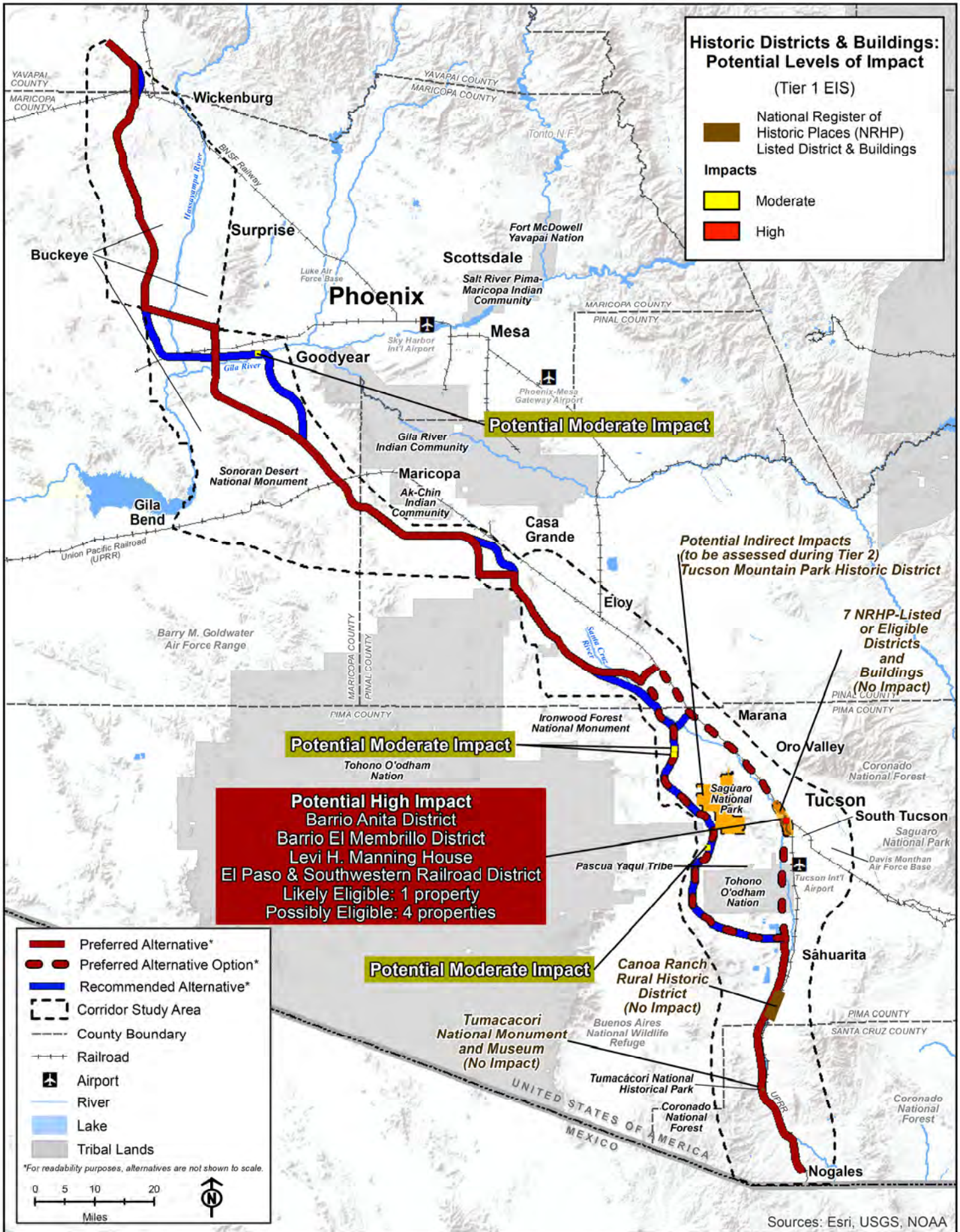


Figure 3.7-2. Potential Levels of Impact on Historic Districts and Buildings in the Recommended and Preferred Alternatives



1 Tier 2 studies will further evaluate the west and east options of the Preferred Alternative in Pima
2 County, but the primary differences identified by the Tier 1 analysis (ADOT 2020a, 2020b) are:

3 • Considerably more of the east option has been surveyed for cultural resources (64 percent
4 compared to 22 percent along the west option), and therefore the cultural resources of the
5 east option are more thoroughly documented.

6 • The recorded density of archaeological sites and historic structures along the east option is
7 higher (5.5 per corridor mile compared to 3.6 along the west option), and the impact
8 assessment estimated a few more NRHP-eligible sites and structures could be affected
9 (approximately 35 to 45 compared to 30 to 40 along the west option).

10 • The archaeological sites along the east option corridor include more complex prehistoric
11 habitation sites along the Santa Cruz River (prior surveys suggest there could be
12 approximately 25 compared to 10 along the upland west option). Many of the east option
13 archeological sites are deeply buried in floodplain alluvium and could require considerable
14 mitigation efforts, but many have been at least partially excavated to mitigate impacts of
15 prior improvements of I-10. In contrast, development has disturbed fewer of the
16 archaeological sites along the west option.

17 • The east option has potential to directly affect the NRHP-listed Barrio Anita and Barrio El
18 Membrillo Historic Districts and Levi H. Manning House, and the NRHP-eligible El Paso and
19 Southwestern Railroad District along I-10. The west option has potential to indirectly affect
20 the recently nominated but not yet listed Tucson Mountain Park Historic District.

21 **3.7.6 Mitigation and Tier 2 Analysis**

22 **3.7.6.1 Tier 2 Analysis Commitments**

23 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
24 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
25 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
26 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
27 Tier 2 analyses will also identify measures to avoid, minimize, or mitigate impacts to cultural
28 resources. Specifically, ADOT commits to carrying out the following analysis during the Tier 2
29 process:

30 • **T2-Cultural-1:** Collect additional information to further evaluate the west and east options of
31 the Preferred Alternative in Pima County and arrange for cultural resource surveys to
32 inventory and evaluate the NRHP eligibility of cultural resources within the area of potential
33 effects of each Tier 2 project, in coordination with the Section 106 Consulting Parties and
34 pursuant to the requirements of Section 106 of the National Historic Preservation Act, any
35 other applicable regulations, and any executed agreement documents. This will include, as
36 necessary and upon request from Consulting Tribes, additional ethnographic and/or
37 traditional cultural property studies.

38



1 3.7.6.2 Mitigation Commitments

2 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
3 impacts to cultural resources from the Project (generally referred to as mitigation measures)
4 during this Tier 1 process. Specific mitigation that ADOT is committing to implement if a Build
5 Alternative is selected includes:

- 6 • **MM-Cultural-1:** Implement commitments identified during the Tier 1 process; commitments
7 in the I-11 Final Programmatic Agreement (**Appendix E7** [Section 106 Consultation
8 Summary and Programmatic Agreement]), if executed; and any additional commitments from
9 the Tier 2 process. During the Tier 1 process, ADOT has committed to the avoidance of
10 adverse effects upon AZ T:14:115(ASM). ADOT has also committed to the avoidance of
11 adverse effects upon historic canals that have been or may be determined eligible for listing
12 in the NRHP pursuant to 36 CFR 60.4(a), (b), and/or (c); and in such instances as the
13 consulting party or parties with jurisdiction over said structures request avoidance.
- 14 • **MM-Cultural-2:** Work to avoid or minimize adverse effects on historic properties listed in or
15 eligible for the NRHP, including traditional cultural properties, as well as cultural resources
16 not yet evaluated for NRHP eligibility. In coordination with the Section 106 Consulting
17 Parties, ADOT would develop treatment measures to mitigate any unavoidable adverse
18 effects. This will include, as necessary and upon request from Consulting Tribes, additional
19 ethnographic and/or traditional cultural property studies.

20 3.7.6.3 Additional Mitigation to be Evaluated in Tier 2

21 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
22 above, to include best practices, permit requirements, and/or other mitigation strategies
23 suggested by agencies, tribes, or the public.



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1 **3.8 Noise**

2 **3.8.1 Summary of Draft Tier 1 EIS**

3 Noise is generally defined as unwanted or undesirable sound. Some of the most pervasive
4 sources of noise in the environment can come from transportation systems. Noise barriers along
5 a highway are most effective for homes within about 300 feet of the highway. Beyond that, noise
6 barriers are less effective, but the natural decrease in noise with distance usually reduces noise
7 levels to acceptable levels. Noise levels decrease by about 3 to 4.5 decibels for each doubling
8 of the distance from the source roadway.

9 Ground vibration was not evaluated as part of the Tier 1 analysis. No federal requirements
10 specifically address highway traffic-induced vibration. Studies that highway agencies have
11 completed to assess the impact of operational traffic-induced vibrations showed that both
12 measured and predicted vibration levels are less than any known criteria for structural damage
13 to buildings. In fact, normal living activities (e.g., closing doors, walking across floors, operating
14 appliances) within a building have been shown to create greater levels of vibration than highway
15 traffic. Vibration concerns would be addressed on a case-by-case basis during Tier 2, as
16 deemed appropriate.

17 FHWA assesses noise impacts in accordance with 23 CFR 772, Procedures for Abatement of
18 Highway Traffic Noise and Construction Noise. The noise evaluation conducted for the I-11
19 Corridor is consistent with FHWA guidelines for assessing highway traffic noise (FHWA 2011b)
20 and the most current version of ADOT *Noise Abatement Requirements* (NAR) (ADOT 2017m).
21 The goal of the traffic noise analysis was to determine the total number of receptors where
22 future noise levels would approach or exceed the applicable Noise Abatement Criteria (NAC),
23 potentially warranting consideration of noise abatement measures during Tier 2 analysis. The
24 procedure used to evaluate potential noise impacts at the Tier 1 level included the following
25 steps:

- 26 1. Identify noise sensitive land uses within the analysis area in accordance with the FHWA
27 NAC Table (FHWA 2011b).
- 28 2. Establish existing noise levels.
- 29 3. Predict future (2040) noise levels using the FHWA Traffic Noise Model (TNM) version 2.5.
- 30 4. Determine areas where potential traffic noise impacts at noise sensitive receivers are
31 expected to occur.
- 32 5. Describe where potential noise impacts could occur during construction of the Build Corridor
33 Alternatives.
- 34 6. Discuss noise mitigation strategies for those areas where noise impacts could potentially
35 occur.
- 36 7. Determine the zoning classification of vacant and undeveloped lands within the analysis
37 area to be made available to local planning agencies for their use in land use planning.

1 The analysis following this procedure was documented in Draft Tier 1 EIS **Appendix E8** (Noise
2 Report). The detailed analysis covered over 1,000 modeled receptors for each noise sensitive
3 land use within the analysis area. A second more generalized approach focused on predicting
4 noise levels at set distances (50, 100, 250, 500, and 1,000 feet) from the edge of the right-of-
5 way. This approach used TNM 2.5 and the same traffic volumes and typical section
6 assumptions as the more detailed analysis. It was intended to provide a high-level summary of
7 noise levels that could be expected at sensitive land uses that fall within those distances. The
8 results of the more generalized approach were presented in Draft Tier 1 EIS **Section 3.8**
9 (Noise).

10 NAC are used to define the noise levels that are considered an impact for each land use activity
11 category (**Table 3.8-1**). If future noise levels approach or exceed the NAC, they are considered
12 noise impacts under ADOT’s NAR. “Approach” is defined as noise levels within one decibel on
13 the A-weighted scale (dBA) of the NAC. In addition, a 15 dBA increase over existing noise
14 levels is considered a substantial increase in noise and would constitute an impact.

15 Noise sensitive land uses within the South Section (between Nogales and Casa Grande)
16 include residential, places of worship, schools, hotels, and parks/trails. Land uses in the Central
17 and North Sections primarily consist of scattered residences, agricultural land, industrial, and
18 undeveloped areas.

19 Most noise sensitive land uses within the analysis area are expected to experience potential
20 noise impacts. Noise abatement would need to be evaluated in the Tier 2 analysis at locations
21 under all three Build Corridor Alternatives. All three alternatives may have similar numbers of
22 modeled noise sensitive receiver locations. Examples of noise sensitive areas include
23 residential homes, campgrounds, parks, picnic areas, places of worship, schools, trails,
24 restaurant patios, and hotels. Noise abatement measures can include noise walls, reduced
25 speeds, and truck traffic restrictions.

26 **Table 3.8-1. Noise Abatement Criteria**

Activity Category ^a	Activity Leq(h) ^{b,c}	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, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, churches, 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, churches, 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–D or F.



Activity Category ^a	Activity Leq(h) ^{b,c}	Activity Description
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.

1 SOURCE: FHWA 2011b; 23 CFR 772.

2 ^a Activity Categories B, C, and E include undeveloped lands permitted for each activity category.

3 ^b The 1-hour equivalent loudness in dBA, which is the logarithmic average of noise over a 1-hour period.

4 ^c The Leq(h) activity criteria values are for impact determination only, and are not design standards for noise abatement measures.

5 3.8.2 Summary of Changes Since Draft Tier 1 EIS

6 Agency and public feedback regarding noise from the Project focused on impacts to residential
7 areas, including Green Valley, Avra Valley, Casa Grande, Buckeye, and Wickenburg, and
8 increased noise levels throughout the analysis area. There was a high level of concern
9 regarding the impacts of increased noise levels in Saguaro National Park, Tucson Mitigation
10 Corridor, and other sensitive resources, citing sensitive habitat and wildlife present in the park.

11 3.8.2.1 Revised 2040 Noise Levels for Build and No Build Alternatives

12 The TNM 2.5 models used to predict 2040 noise levels at set distances from the right-of-way
13 were revised with updated AZTDM traffic volumes. Revised noise modeling results for the
14 Purple, Green, and Orange Build Corridor Alternatives are provided in **Table 3.8-2**. Generally,
15 revised noise levels along Options A, C, I2, L, M, R, and U increased by 1 to 5 dBA due to
16 higher projected traffic volumes in the updated modeling. However, along Option F (Green and
17 Recommended Alternatives), noise levels decreased by 9 to 11 dBA due to a decrease in
18 projected traffic volumes. These results are consistent with the findings of the Draft Tier 1 EIS,
19 which predicted future traffic noise impacts at a majority of the modeled noise receiver locations
20 within the analysis area.

21 **Table 3.8-2. Summary of Predicted 2040 Traffic Noise Levels**

Option	Total Right-of-Way Width (feet)	Distance From Edge of Right-of-Way				
		50 feet	100 feet	250 feet	500 feet	1,000 feet
Purple Alternative						
A	300	71	69	64	59	53
C ^a	400	66	65	61	56	50
G	400	74	72	67	62	56
I1	400	70	69	65	60	54
I2	400	70	68	64	60	54
L	400	67	65	62	57	51
N	400	71	69	65	61	55
R	400	70	69	65	60	54
X	400	61	59	55	50	44



Option	Total Right-of-Way Width (feet)	Distance From Edge of Right-of-Way				
		50 feet	100 feet	250 feet	500 feet	1,000 feet
Green Alternative						
A	300	71	69	64	59	53
D ^b	400	59	57	53	48	42
F	400	59	57	52	47	42
I2	400	70	68	65	60	54
L	400	70	68	64	60	54
M	400	70	68	65	60	54
Q2	500	69	67	64	59	53
R	400	74	72	68	64	58
U	400	63	61	57	52	46
Orange Alternative						
A	300	71	69	64	59	53
B (portion along I-19)	300	76	73	67	62	55
B (portion along I-10)	400	78	77	72	67	60
I-10 Connector	400	46	44	39	35	30
G	400	74	72	67	62	56
H	300	67	65	61	56	49
K	300	67	65	61	56	49
Q1	400	64	62	58	53	47
Q2	500	70	68	64	60	54
Q3	300	77	74	69	64	57
S	400	62	61	57	52	46

1 SOURCE: **Appendix E8** (Technical Memorandum: I-11 Noise Report Addendum).

2 ^a Noise levels predicted for Option C are representative of noise levels for both Option C along Sandario Road and Option C with the
3 CAP Design Option.

4 ^b Noise levels predicted for Option D are representative of noise levels for both Option D along Sandario Road and Option D with the
5 CAP Design Option.

6
7 Under the Purple Alternative, noise impacts would generally occur within 100 feet of the right-of-
8 way, but potential impacts would occur at greater distances along segments co-located with I-10
9 and I-8 due to higher combined traffic volumes. Under the Green Alternative, noise impacts are
10 predicted to occur at most locations within 100 feet of the right-of-way. Under the Purple and
11 Green Alternatives, noise levels 1,000 feet away from I-11 are predicted in the range of 42 to
12 58 dBA, which would not exceed the FHWA NAC for any of the land use categories present.
13 Traffic volumes are directly related to modeled noise level predictions; higher traffic volumes
14 result in higher noise levels.

15 Noise impacts for the Orange Alternative are likely to occur at representative, frequently used
16 noise sensitive land uses within 250 feet of the edge of the right-of-way. Potential impacts would
17 occur out to 500 feet along some of the corridor options co-located with existing facilities due to
18 higher combined traffic volumes.

19 Similarly, the TNM 2.5 models used to predict 2040 Build Alternative noise levels at major parks
20 and recreation areas were revised with updated AZTDM traffic volumes. **Table 3.8-3** presents



1 the revised noise levels, including distance to the point along the park/recreation area boundary
 2 closest to the corridor option. Generally, noise levels along Options B (Saguaro National Park
 3 near I-10), C, D, CAP Design Option, and Q1 decreased 1 to 6 dBA due to lower traffic
 4 volumes. Noise levels along Options B (Tucson Mountain Park along Ajo Way and I-19), F, M,
 5 S, U, and X increased 1 to 6 dBA due to higher traffic volumes.

6 **Table 3.8-3. Summary of Predicted 2040 Traffic Noise Levels at Major Parks and**
 7 **Recreation Areas**

Alternative/Option	Description	Approximate Distance from Edge of Corridor (feet)	dBA
Orange/B ^a	Saguaro National Park	7,884	43
	Tucson Mountain Park	8,890	46
Purple/C	Saguaro National Park	2,058	45
	Tucson Mountain Park	5,970	39
	Ironwood Forest National Monument	5,965	39
Green/D	Ironwood Forest National Monument	5,965	31
CAP Design Option	Saguaro National Park	1,500 ^b	34 ^c
	Tucson Mountain Park	210	54 ^c
Green/F	Ironwood Forest National Monument	574	49
Orange/H ^a	Sonoran Desert National Monument	50	78
Purple and Green/I2	Sonoran Desert National Monument	14,078	39
Orange/K ^a	Sonoran Desert National Monument	50	78
Purple/L	Sonoran Desert National Monument	500	61
Green/M	Sonoran Desert National Monument	2,820	47
Purple/N	Sonoran Desert National Monument	3,921	46
Orange/Q1 ^a	Sonoran Desert National Monument	2,310	41
Orange/S	Proposed Vulture Mine RMZ	50	75
Green/U	Proposed Vulture Mine RMZ	50	76
Purple/X	Proposed Vulture Mine RMZ	50	74

8 SOURCE: **Appendix E8** (Technical Memorandum: I-11 Noise Report Addendum).

9 ^a Option co-located with an existing facility.

10 ^b The receiver placement at Saguaro National Park was revised to a location 1,500 feet away from the right-of-way to be consistent
 11 with the distance to Saguaro National Park cited in Final Tier 1 EIS **Chapter 4** (Draft Preliminary Section 4(f) Evaluation).

12 ^c In the Draft Tier 1 EIS, data in these two cells were inadvertently omitted. Those noise levels are reported here; however, there
 13 was no change to noise models or methodology.

14
 15 2040 No Build noise levels in the Draft Tier 1 EIS were predicted from the edge of pavement,
 16 which placed the receivers closer to the roadway. The predicted 2040 No Build noise levels
 17 were revised to be calculated from the edge of right-of-way. **Table 3.8-4** presents revised No
 18 Build noise levels.



1 **3.8.2.2 Additional Noise Receivers**

2 Draft Tier 1 EIS **Appendix E8** (Noise Report) presented a detailed analysis of over 1,000
3 modeled receptors within analysis areas for the Purple, Green, and Orange Alternatives.
4 Additional receptors were identified within noise sensitive land uses in the additional analysis
5 areas for the Recommended and Preferred Alternatives, including Anamax Park shift and the
6 realignment of Option F. Representative noise levels for these areas were characterized based
7 upon the receptors presented in the Draft Tier 1 EIS, and the potential impacts are consistent
8 with the noise levels for the Recommended and Preferred Alternatives set distances (**Appendix**
9 **E8** [Technical Memorandum: I-11 Noise Report Addendum]).

10 **3.8.3 No Build Alternative**

11 Under the No Build Alternative, I-11 would not be constructed. Noise levels along existing
12 transportation facilities throughout the Study Area would likely increase due to the projected
13 population growth and the accompanying increased future traffic volumes. As shown in
14 **Table 3.8-4**, noise levels exceeding the NAC would potentially occur at most noise sensitive
15 land uses within 250 feet of the edge of the I-11 right-of-way. For the Draft Tier 1 EIS, the No
16 Build predicted noise levels were analyzed at various distances from the existing edge of
17 pavement, and both directions of traffic volumes were combined onto one roadway. For the
18 Final Tier 1 EIS, predicted noise levels were modified and analyzed from the right-of-way at
19 various distances. Updated directional traffic was used based on current projected volumes. In
20 comparing 2040 No Build predicted noise levels to the 2040 Build Alternative predicted noise
21 levels, at 100 feet from the edge of the right-of-way along I-19 (from Nogales to I-10), the 2040
22 No Build predicted noise levels are generally 1 to 2 dBA lower than the 2040 Build Alternative
23 predicted noise levels. Along I-10 and I-8 (Option G), the 2040 No Build predicted noise levels
24 are generally 2 to 3 dBA lower than the 2040 Build Alternative predicted noise levels. Along I-8
25 (Option H), the 2040 No Build predicted noise levels are generally 2 dBA higher than the 2040
26 Build Alternative predicted noise levels. Along SR 85 south of I-10, the 2040 No Build predicted
27 noise levels are up to 2 dBA higher than the 2040 Build Alternative predicted noise levels. Along
28 SR 85 north of I-10, the 2040 No Build predicted noise levels are generally 3 dBA lower than the
29 2040 Build Alternative predicted noise levels.

30 As a general matter, new highway alignments constructed in otherwise quiet noise
31 environments, such as those in the undeveloped areas of the corridor, will often result in a
32 substantial noise increase at nearby residences (i.e., 15 dBA or greater increases over existing
33 noise levels) compared to the No Build Alternative. Draft Tier 1 EIS **Table 3.8-3** includes
34 existing noise levels measured in rural areas not near an existing highway. Measured noise
35 levels in rural areas ranged from 39 dBA (along the west option in Pima County) to 49 dBA
36 (along the Recommended Alternative in Buckeye). While 2040 No Build noise levels could be
37 similar to existing measured noise levels, they may be higher due to new noise sources
38 introduced by continued growth and development. More detailed noise analysis will be
39 completed in future Tier 2 environmental reviews.



1 **Table 3.8-4. Summary of Predicted 2040 Traffic Noise Levels – No Build**
2 **Alternative**

Option	Distance From Edge of Right-of-Way				
	50 feet	100 feet	250 feet	500 feet	1,000 feet
I-19 (Nogales to Sahuarita)	70	68	63	58	52
I-19 (Sahuarita to I-10)	73	71	66	61	55
I-10 (I-19 to Marana)	76	74	70	65	59
I-10 (Marana to I-10 Connector)	72	70	66	61	55
I-8 (I-10 Connector to Gila Bend)	69	67	63	58	52
SR 85 (Q1, Gila Bend to Buckeye Hills)	65	62	57	52	46
SR 85 (Q2, near Buckeye Hills)	72	70	65	60	54
SR 85 and I-10 (coincident with Option Q3)	73	71	66	61	55

3 SOURCE: **Appendix E8** (Technical Memorandum: I-11 Noise Report Addendum).

4 **3.8.4 Recommended Alternative**

5 Based on the TNM results for both the Recommended and Preferred Alternatives, future traffic
6 noise levels at most noise sensitive land uses (Categories B, C, and E) within 100 to 500 feet of
7 the I-11 right-of-way are predicted to exceed FHWA NAC. If future noise levels approach or
8 exceed the NAC, they are considered noise impacts under ADOT's NAR and warrant further
9 consideration of noise abatement. **Table 3.8-5** summarizes where future noise levels would
10 approach or exceed the NAC along the Recommended and Preferred Alternatives. Generally,
11 noise impacts could occur at noise sensitive land uses within 100 feet of the edge of the right-of-
12 way. For both alternatives, future noise levels as far as 500 feet away from the right-of-way
13 could potentially exceed the NAC. Perceptible changes in noise levels along the west option in
14 Pima County could extend a greater distance in the Saguaro National Park, Tucson Mountain
15 Park, Ironwood Forest National Monument, and designated wilderness areas due to the
16 relatively low existing noise levels. In general, new highway alignment constructed in a quiet or
17 undeveloped area would typically result in an increase of 15 dBA or greater, which would
18 warrant consideration of mitigation measures for noise impacts during Tier 2 studies.

19 **Table 3.8-5. Summary of Potential Noise Impacts for the Recommended and**
20 **Preferred Alternatives**

Geography	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Nogales to Sahuarita	200–500 feet of ROW	250–500 feet of ROW	250–500 feet of ROW
Sahuarita to Marana	Within 250 feet of ROW	Within 250 feet of ROW	250–500 feet of ROW
Marana to Casa Grande	Within 100 feet of ROW	Within 100 feet of ROW	Within 100 feet of ROW
Casa Grande to Buckeye	Within 100 feet of ROW	Within 250 feet of ROW	Within 250 feet of ROW
Buckeye to Wickenburg	Within 100 feet of ROW	Within 100 feet of ROW	Within 100 feet of ROW

21 SOURCE: **Appendix E8** (Technical Memorandum: I-11 Noise Report Addendum).

22 ROW = right-of-way

23 NOTE: If future noise levels approach or exceed the NAC, they are considered noise impacts under ADOT's NAR and warrant
24 further consideration of noise abatement.



1 **3.8.5 Preferred Alternative**

2 The Preferred Alternative would result in increased noise levels, impacting communities
3 surrounding the corridor. **Table 3.8-5** summarizes where future noise levels would approach or
4 exceed the NAC along the Recommended and Preferred Alternatives. Compared to the
5 Recommended Alternative, the changes incorporated into the Preferred Alternative would result
6 in fewer noise impacts in one location but more noise impacts in another. Near Casa Grande,
7 while there would be fewer noise impacts near SR 84 and Burris Road, the Preferred Alternative
8 would result in higher noise levels along Montgomery Road. Compared to the Recommended
9 Alternative in Goodyear, the Preferred Alternative would result in fewer impacts to the CantaMia
10 residential community but may result in higher noise levels to the sensitive receivers adjacent to
11 SR 85. Compared to the Recommended Alternative in Wickenburg, the Preferred Alternative
12 would most likely result in lower noise levels to the Vista Royale residential community than
13 those under the Recommended Alternative.

14 • **Nogales to Sahuarita:** Noise levels could increase in residential, commercial, and
15 recreational areas along co-located I-10. If the Tier 2 noise analysis determines that noise
16 sensitive receivers are at or above the NAC or if noise levels increase substantially (15 dBA
17 or more) from existing noise levels due to I-11, ADOT will evaluate noise abatement
18 measures in accordance with the ADOT NAR.

19 • **Sahuarita to Marana:** The Preferred Alternative with east option in Pima County would
20 increase noise levels in residential, commercial, cultural/historic, and recreational areas,
21 which would affect residential areas/sites in downtown Tucson. The Preferred Alternative
22 with east option in Pima County would result in fewer permanent impacts to recreation
23 areas/sites (e.g., Saguaro National Park) because I-11 would be co-located with existing
24 interstate facilities. The west option would increase noise levels and alter the soundscape in
25 residential and recreational areas that have lower existing ambient noise levels. The
26 relocated I-10 interconnection, which extends through undeveloped land, would impact
27 fewer residential areas in Marana.

28 • **Marana to Casa Grande:** The Preferred Alternative would alter the soundscape in areas in
29 Marana and Eloy that have low, rural existing ambient noise levels. The Preferred
30 Alternative would result in increased noise levels in residential areas along Montgomery
31 Road.

32 • **Casa Grande to Buckeye:** The Preferred Alternative would alter the soundscape in rural
33 areas that have low existing ambient noise levels. Compared to the Recommended
34 Alternative, the Preferred Alternative would avoid noise impacts in CantaMia, Estrella
35 Mountain Ranch, and along Beloat Road north of the Gila River in Buckeye, Palo Verde,
36 and Tonopah. Instead, the Preferred Alternative would result in noise impacts along SR 85
37 and I-10 in Buckeye, Palo Verde, and Tonopah, where there are fewer noise sensitive
38 receivers along the existing highway facilities than along the Recommended Alternative.

39 • **Buckeye to Wickenburg:** The Preferred Alternative could increase noise levels for
40 residential and recreational areas near Wickenburg. Compared to the Recommended
41 Alternative, the Preferred Alternative would result in lower noise levels in the Vista Royale
42 residential community.



1 **3.8.6 Mitigation and Tier 2 Analysis**

2 **3.8.6.1 Tier 2 Analysis Commitments**

3 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
4 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
5 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
6 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
7 Tier 2 analysis will include detailed noise modeling based on the engineering design, impact
8 and mitigation analysis, and measures to avoid, minimize, or mitigate noise impacts.
9 Specifically, ADOT commits to carrying out the following analysis during the Tier 2 process:

- 10 • **T2-Noise-1:** Conduct a Tier 2 traffic noise analysis in accordance with the current ADOT
11 NAR as well as 23 CFR 772. The Tier 2 analysis will include conducting noise
12 measurements to characterize the existing noise environment in areas adjacent to segments
13 of I-11 that consist of a new highway on new alignment where a substantial noise increase
14 (a 15 dBA increase over existing noise levels) would be likely. Noise abatement measures
15 will be considered where traffic noise impacts are identified, and abatement measures found
16 to be both feasible and reasonable will be incorporated into the project.
- 17 • **T2-Noise-2:** Evaluate potential construction noise impacts and assess construction noise
18 mitigation, as needed and in accordance with current ADOT NAR. ADOT will determine
19 whether any additional measures are needed in the plans or specifications to minimize or
20 eliminate adverse impacts from construction noise.

21 **3.8.6.2 Mitigation Commitments**

22 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
23 noise impacts from the Project (generally referred to as mitigation measures) during this Tier 1
24 process. Specific mitigation that ADOT is committing to implement if a Build Alternative is
25 selected includes:

- 26 • **MM-Noise-1:** Consider noise abatement measures where traffic noise impacts are identified
27 during Tier 2 analysis. Abatement measures found to be both feasible and reasonable will
28 be incorporated into the project.

29 **3.8.6.3 Additional Mitigation to be Evaluated in Tier 2**

30 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
31 above, to include best practices, permit requirements, and/or other mitigation strategies
32 suggested by agencies or the public. Examples of measures that ADOT may evaluate in Tier 2
33 include:

- 34 • Noise barriers
- 35 • Earthen berms
- 36 • Refinement of horizontal and vertical alignments
- 37 • Reduced speeds
- 38 • Truck traffic restrictions



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1 **3.9 Visual and Aesthetics**

2 **3.9.1 Summary of Draft Tier 1 EIS**

3 Visual impacts were assessed in accordance with FHWA's *Guidelines for the Visual Impact*
4 *Assessment of Highway Projects* (FHWA 2015) using an Abbreviated Visual Impact
5 Assessment. The visual effects analysis of the Build Corridor Alternatives considered impacts
6 within the area of visual effect, defined as 5 miles from the edge of any given Build Corridor
7 Alternative. A detailed discussion of the Visual Impact Assessment methodology is included in
8 Draft Tier 1 EIS **Section 3.9.2** (Methodology).

9 The visual resources inventory and the assessment of potential impacts included the evaluation
10 of visual character, visual quality, viewer sensitivity, and visual contrast levels of the proposed
11 project. BLM Visual Resource Management (VRM) classifications and NPS resource
12 management objectives also were included in the inventory to assess conformance where
13 applicable.

14 Fifteen distinct landscape units and associated representative viewpoints were defined within
15 the area of visual effects. Two distinct groups of viewers were evaluated within the area of
16 visual effect: neighbors and travelers, which are further subdivided to help establish viewer
17 preferences and awareness to changes in visual resources.

18 **3.9.1.1 Affected Environment**

19 ***Nogales to Sahuarita*** includes urban development around the Tucson metropolitan area and
20 smaller urban and suburban development concentrations in and around Nogales, Tumacácori,
21 Tubac, Amado, Green Valley, and Sahuarita and large-scale industrial uses along I-19 and I-10.
22 These areas are surrounded by Sonoran Desert Mountain ranges. Natural areas outside of
23 developed landscape areas include vegetation communities that are typically either arid or
24 natural appearing grazing land of creosote, tarbush, and other desert scrub.

25 ***Sahuarita to Marana*** has active agricultural fields near unimproved roads, distribution lines,
26 and rural residences. This area is fairly intact with a low level of encroachment with some visual
27 interest associated with the lower Sonoran Desert and active agricultural landscape. The scale
28 of rural residential development is less noticeable than more densely developed areas; the
29 overall unit is cohesive with the surrounding agricultural landscape.

30 ***Marana to Casa Grande*** has rural residences but they are not the primary land use in this
31 landscape setting. Agricultural fields generally lack striking visual patterns, or landforms, and
32 built features are mostly limited to canals, roads, and small structures. Vegetative cover from
33 crops is seasonal. Views in this area are typically open and unrestricted. The overall rating of
34 visual quality for this area is low to moderate, primarily due to the encroachment of
35 development.

36 ***Casa Grande to Buckeye*** is characterized by agricultural land uses such as dryland and
37 irrigated agriculture in the valleys near Casa Grande, western Pinal County, Buckeye, and along
38 the Gila River, with development concentrations around Casa Grande, Gila Bend, and Buckeye.



1 **Buckeye to Wickenburg** is the least-developed area within the area of visual effect with large
2 undeveloped areas, although some rural and suburban residences are near I-10 and Sun Valley
3 Parkway.

4 **3.9.1.2 Visual Impacts**

5 In general, the Build Corridor Alternatives would have less visual change in areas with existing
6 transportation corridors or other development compared to areas on new alignments or with less
7 existing development. The primary exception to this is in downtown Tucson, where the range of
8 future cross sections necessary to provide capacity improvements along I-10 could include
9 right-of-way expansion or an elevated facility. Either option, or a combination thereof, would
10 expose the adjacent historic districts to impacted foreground views. A tunnel or depressed
11 facility would be less visible to adjacent historic districts.

12 All Build Corridor Alternatives would have potential light pollution effects and incrementally
13 increase skyglow by introducing new sources of light that could impact recreational stargazing,
14 particularly in designated International Dark-Sky Association locations.

15 To address portions of the Build Corridor Alternatives that cross BLM-administered lands, the
16 Visual Impact Assessment evaluates the compatibility of I-11 to applicable BLM VRM
17 classifications to determine conformance to adopted policies. BLM VRM classifications, ranging
18 from Class I to Class IV, and their associated objectives define the levels of acceptable visual
19 change (contrast) allowed on BLM-administered land. BLM designates these classifications
20 based in part on the inventoried scenic values and other land use allocations during the
21 resource management planning process. **Table 3.9-1** of the Draft Tier 1 EIS describes the
22 management objectives associated with each BLM VRM Class designation, per BLM Manual
23 H-8410-1 (BLM 1986).

24 BLM Class I lands are limited to wildernesses. All Class I lands that fall within the Orange
25 Alternative are along I-8, where no new right-of-way would be required. Most of the Sonoran
26 Desert National Monument is designated as VRM Class II, as well as some areas between
27 Buckeye and Wickenburg. Other areas, including the BLM-designated multi-use corridor, are
28 managed as VRM Class III within the Vulture Mine RMZ and as Class IV outside of the Vulture
29 Mine RMZ. The majority of the BLM-administered lands within the Build Corridor Alternatives
30 are allocated to VRM Class III. Management objectives for VRM Class III lands include partially
31 retaining their existing character and allowing for moderate change to the subject landscape
32 (BLM 2012). Hence, BLM is unlikely to require amendment to their Resource Management Plan
33 in Class III areas.

34 Saguaro National Park West and Tucson Mountain Park lie within the area of visual effect west
35 of Tucson, and the Build Corridor Alternatives could be visible from elevated and unobstructed
36 locations. The magnitude of visual impact would vary depending on the viewer's location within
37 the park and the time of the visit (daytime or nighttime).

38 **3.9.2 Summary of Changes Since Draft Tier 1 EIS**

39 BLM, NPS, and Reclamation provided feedback on visual resources. BLM requested additional
40 discussion regarding impacts to the Ironwood Forest National Monument as well as clarification
41 of the impacts to BLM VRM classifications. Impacts to the Ironwood Forest National Monument



1 are addressed in **Section 3.4** (Recreation) of the Draft Tier 1 EIS and in **Section 3.9.4** and
2 **Section 3.9.5** of this Final Tier 1 EIS. NPS requested additional discussion regarding mitigation
3 measures for anticipated impacts to Saguaro National Park and requested simulations of the
4 corridor. Reclamation noted concerns regarding increase in skyglow from the introduction of
5 new light sources and development due to the new transportation corridor.

6 The public expressed concerns about visual impacts to Saguaro National Park, light pollution
7 and impacts to dark skies, impacts to rural character and avoiding urban sprawl, and impacts to
8 the Kitt Peak Observatory. The Draft Tier 1 EIS stated that light sources from new segments of
9 highway and future developments could create light pollution that would impact wildlife behavior
10 and would obstruct individual animals from accessing and departing Tucson Mountain Park and
11 Saguaro National Park from the west. The segments of the Build Corridor Alternatives that are a
12 new highway on a new alignment would increase skyglow and impact dark skies if no mitigation
13 strategies are implemented. Site-specific roadway and lighting designs are not available at the
14 Tier 1 stage. Analyses of potential effects of roadway lighting designs are anticipated in the Tier
15 2 analysis. In addition, mitigation strategies will be developed to minimize light pollution in
16 sensitive areas. Pima County, the Town of Marana, the City of Tucson, and the Town of
17 Sahuarita have local dark skies ordinances regulating outdoor lighting fixtures to minimize light
18 pollution at night. ADOT would comply with applicable local ordinances.

19 The Kitt Peak Observatory is located approximately 40 miles southwest of Tucson and 15 miles
20 outside of the area of visual effect and would not likely experience impacts from the proposed
21 project.

22 In their comments on the Draft Tier 1 EIS, BLM requested an inventory of BLM VRM
23 classifications within the Build Corridor Alternatives. **Table 3.9-1** summarizes acres of VRM
24 classes within the Build Corridor Alternatives.

25 **Table 3.9-1. Acreage Summary of BLM VRM Classes in the 2,000-foot-wide**
26 **Corridors of the Purple, Green, and Orange Alternatives**

VRM Classification	Purple Alternative	Green Alternative	Orange Alternative
Class I	0	0	456 ^a
Class II	0	0	402
Class III	2,484	2,639 ^b	7,318 ^b
Class IV	3,402	7,738 ^b	4,669 ^b

27 Source: BLM VRM dataset (2016), ASLD ALRIS dataset (2014).

28 ^a Entirely along I-8, where no additional right-of-way would be required.

29 ^b Portions along I-8 and/or SR 85, where no additional right-of-way would be required.

30
31 The list of designated international dark sky places was updated. In southern Arizona, three
32 places are designated by International Dark-Sky Association:

- 33 • Tumacácori National Historical Park is adjacent to the Orange Alternative where I-11 is co-
34 located with I-19.
- 35 • Oracle State Park, at its closest point to a Build Corridor Alternative, is approximately
36 30 miles east of the Orange Alternative, where I-11 is co-located with I-10.



- 1 • Kartchner Caverns State Park, at its closest point to a Build Corridor Alternative, is
2 approximately 37 miles east of the Orange Alternative, where I-11 is co-located with I-10.

3 3.9.3 No Build Alternative

4 The No Build Alternative would not substantially change the visual character or quality in the
5 Study Area because it would not involve construction or modification to accommodate additional
6 infrastructure (e.g., additional lanes, overpasses, median modifications) associated with I-11.
7 Over time, the visual character and quality in the area of visual effect would change due to
8 continued urbanization of the Study Area and construction of the programmed projects that
9 define the No Build Alternative. Urban expansion could encroach on portions of the area of
10 visual effect that are currently rural or undeveloped, leading to a more urbanized character.
11 Anticipated changes would have beneficial effects and adverse impacts on visual quality. The
12 visual character and visual quality of new development would depend on what is constructed.
13 Future development may or may not be harmonious with the existing visual elements and
14 patterns, and community members may or may not object to the changes.

15 3.9.4 Recommended Alternative

16 This section provides a summary of potential effects on visual resources associated with the
17 Recommended Alternative. Detailed discussion of the impacts is presented in **Appendix E9**
18 (Visual Effects on Selected Viewpoints and Landscapes).

- 19 • **Nogales to Sahuarita.** The Recommended Alternative would be co-located with I-19 and
20 would not require additional lanes. Visual changes to the landscape as a result of I-11 would
21 not be readily apparent.
- 22 • **Sahuarita to Marana.** The Recommended Alternative would introduce changes to the
23 landscape character. Visitors to Saguaro National Park West and Tucson Mountain Park
24 (trails) would be highly sensitive to visual changes in the landscape. Depending on the
25 location, these visitors would have middleground views of the corridor. The Recommended
26 Alternative would be more apparent at night than during the daytime where vehicle and
27 roadway lighting are visible. North of the Tucson Mitigation Corridor, the Recommended
28 Alternative would be visible to adjacent, low-density residential development.
- 29 • **Marana to Casa Grande.** The Recommended Alternative would introduce changes to the
30 landscape character. Residential viewers of the rural neighborhoods in the Red Rock area
31 would have partially obstructed middleground views. The Ironwood Forest National
32 Monument is approximately 1 mile away from the Recommended Alternative at its closest
33 point and would have views of the Recommended Alternative in the foreground and
34 middleground (depending on location). I-11 would be apparent at night where vehicle and
35 roadway lighting are visible.
- 36 • **Casa Grande to Buckeye.** The Recommended Alternative would introduce changes to the
37 landscape character in surrounding agricultural and low-density residential areas. The
38 Recommended Alternative passes through open farmland where new improvements would
39 not follow an existing roadway.



1 • **Buckeye to Wickenburg.** This area is largely undeveloped and there are no highways or
2 other industrial-scale facilities. The Recommended Alternative would introduce changes to
3 the landscape character. It would be visible to recreational travelers along Aguila Road.
4 Visitors to the Vulture Mine RMZ and the off-road racecourse would see I-11 in their
5 foreground and middleground views, depending on location. Some viewpoints in Vulture
6 Mine RMZ would not have views of I-11 due to distance, intervening terrain, and vegetation
7 screening. The Vista Royale neighborhood near Wickenburg is approximately 0.25 mile
8 away and would have foreground and middleground views of I-11 at high elevations.

9 The Recommended Alternative would incrementally increase skyglow, particularly in areas on
10 new alignments where no road currently exists, but would not be expected to substantially
11 increase glare, light trespass, or clutter.

12 The Recommended Alternative would not cross any BLM VRM Class I or II land. **Table 3.9-2**
13 summarizes the BLM VRM classes within the Recommended and Preferred Alternatives.

14 **Table 3.9-2. Acreage Summary of BLM VRM Classes in the 2,000-foot-wide**
15 **Corridors of the Recommended and Preferred Alternatives**

VRM Classification	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Class I	0	0	0
Class II	0	0	0
Class III	2,988	3,097	2,568
Class IV	3,495	7,583	

16 Source: BLM VRM dataset (2016), ASLD ALRIS dataset (2014).

17 3.9.5 Preferred Alternative

18 This section provides a summary of potential effects on visual resources associated with the
19 Preferred Alternative. Detailed discussion of the impacts is presented in **Appendix E9** (Visual
20 Effects on Selected Viewpoints and Landscapes).

21 • **Nogales to Sahuarita.** Impacts of the Preferred Alternative to visual resources would be the
22 same as the Recommend Alternative.

23 • **Sahuarita to Marana.** Impacts of the Preferred Alternative with west option in Pima County
24 would generally be the same as the Recommended Alternative. The Preferred Alternative
25 with east option in Pima County would not be noticeable to motorists and the majority of the
26 neighbors because it is co-located with I-10 and the character of the landscape would
27 remain the same. The primary exception to this is in downtown Tucson, where the range of
28 future cross sections necessary to provide capacity improvements along I-10 could include
29 right-of-way expansion, an elevated facility, or depressed facility. The right-of-way
30 expansion or elevated facility options, or a combination thereof, would expose the adjacent
31 historic districts to impacted foreground views.



- 1 • **Marana to Casa Grande.** Impacts for the Preferred Alternative with west option in Pima
2 County would be the same as the Recommended Alternative, except in the vicinity of the
3 I-10 Connector. The southeast corner of Picacho Peak State Park is approximately 2 miles
4 away from where the east and west options converge at Park Link Drive. From high
5 elevations in the park, the west option may be visible in the middleground. The east option,
6 where it ends at Park Link Drive, would not be evident because it is co-located with I-10 and
7 no additional lanes are needed here. The Preferred Alternative north of the I-10 Connector
8 would be visible from the park. In addition, the Preferred Alternative is farther away from the
9 Ironwood Forest National Monument than the Recommended Alternative in this area. The
10 Preferred Alternative is approximately 1.6 miles away from the Ironwood Forest National
11 Monument, with riparian vegetation obstructing views of the corridor.
- 12 • **Casa Grande to Buckeye.** The Preferred Alternative would introduce changes to the
13 landscape character in the agricultural and low-density residential areas in western Pinal
14 County. The Preferred Alternative would be visible from the Sonoran Desert National
15 Monument. At this location the Preferred Alternative follows a BLM utility corridor adjacent to
16 the Sonoran Desert National Monument where existing modifications to the landscape
17 include unimproved roads and a utility corridor containing two high-voltage transmission
18 lines and several pipelines. The Preferred Alternative is consistent with the landscape where
19 it is co-located with SR 85 and I-10.
- 20 • **Buckeye to Wickenburg.** Impacts to visual resources north of I-10 in western Maricopa
21 County would generally be the same as the Recommended Alternative, except near
22 Wickenburg. The Preferred Alternative is approximately 1 mile farther away from the Vista
23 Royale neighborhood than the Recommended Alternative. The neighborhood would have
24 middleground views of the Preferred Alternative at higher elevations and where
25 unobstructed.

26 The Preferred Alternative would incrementally increase skyglow, particularly on new alignments
27 where no road currently exists, but would not be expected to substantially increase glare, light
28 trespass, or clutter.

29 The Preferred Alternative crosses an area of Class II VRM; however, the alternative is co-
30 located with SR 85 and improvements would be within current ADOT right-of-way and would
31 have no impact. **Table 3.9-2** summarizes the BLM VRM classes within the Recommended and
32 Preferred Alternatives.

33 **3.9.6 Mitigation and Tier 2 Analysis**

34 **3.9.6.1 Tier 2 Analysis Commitments**

35 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
36 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
37 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
38 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
39 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate visual and aesthetic
40 impacts. Specifically, ADOT commits to carrying out the following analysis during the Tier 2
41 process:



- 1 • **T2-Visual-1:** Assess individual Tier 2 projects using FHWA's Visual Impact Assessment
2 Scoping Questionnaire (FHWA 2015). Depending on the findings of the questionnaire, an
3 Abbreviated Visual Impact Assessment may be needed, or a more involved Standard or
4 Expanded Visual Impact Assessment may be required. Simulations may also be prepared to
5 assist with evaluating potential visual impacts.
- 6 • **T2-Visual-2:** Identify site-specific mitigation measures for sensitive viewpoints, including
7 Saguaro National Park West and Tucson Mountain Park.

8 **3.9.6.2 Mitigation Commitments**

9 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
10 impacts to visual and aesthetic resources from the Project (generally referred to as mitigation
11 measures) during this Tier 1 process. Specific mitigation that ADOT is committing to implement
12 if a Build Alternative is selected includes:

- 13 • **MM-Visual-1:** Comply with applicable local ordinances that regulate outdoor lighting to
14 minimize light pollution.
- 15 • **MM-Visual-2:** Comply with appropriate level of FHWA Visual Impact Assessment Guidelines
16 (FHWA 2015) during Tier 2 studies.
- 17 • **MM-Visual-3:** Select roadway lighting that is compatible with locally adopted dark sky
18 objectives and policies, where applicable.
- 19 • **MM-Visual-4:** If the Preferred Alternative with west option is selected during Tier 2 studies,
20 avoid use of roadway lighting at all in the vicinity of the Tucson Mitigation Corridor and
21 Saguaro National Park, except at locations where safety requirements deem it necessary.

22 In addition, the following mitigation commitment is included in **Section 3.17** (Indirect and
23 Cumulative Effects):

- 24 • **MM-Indirect-2:** Exits or interchanges will not be built between West Snyder Hill Road and
25 Manville Road in area around the Tucson Mitigation Corridor in order to limit project-induced
26 development.

27 **3.9.6.3 Additional Mitigation to be Evaluated in Tier 2**

28 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
29 above, to include best practices, permit requirements, and/or other mitigation strategies
30 suggested by agencies or the public. Examples of measures that ADOT may evaluate in Tier 2
31 include:

- 32 • Prepare landscape design plans for visually sensitive areas. These plans will:
 - 33 ○ Protect existing vegetation and add new vegetation to minimize the visual effects of I-11
34 features and to retain and enhance the area's natural features.
 - 35 ○ Minimize the spatial limits of earthwork and grading where possible.



- 1 ○ Implement site restoration plans upon completion of construction.
- 2 ○ Protect and enhance existing rock outcrops.
- 3 ○ Include and treat newly exposed rock outcrops by considering scale, shape, slope, and
- 4 fracturing and by using rock stain where desert rock varnish has been disturbed to
- 5 reduce the color contrast with adjacent rocks.
- 6 ○ Salvage protected native plants to the extent possible.
- 7 ○ Protect existing views and do not block those views with new vegetation or other I-11
- 8 features such as signs.
- 9 ● Include grading designs that create natural-looking slopes, surfaces, and transitions.
- 10 ● Include landscape treatments in stormwater channels and basins to help blend them into
- 11 their surroundings and create new visual resources in the landscape.
- 12 ● Enhance sound walls, retaining walls, headwalls, concrete barriers, riprap, and similar I-11
- 13 features that are highly visible by selecting colors that complement their surroundings and/or
- 14 by using artistic surface treatments, including textures and patterns that support an overall
- 15 design theme compatible with their setting.
- 16 ● Select lighting standards, guardrails, and other supporting features that minimize visual
- 17 impacts.
- 18 ● Use natural-tone metals with non-contrasting, non-glare finishes and color choices that
- 19 match their settings.
- 20 ● Minimize fugitive light from portable light sources used during construction near sensitive
- 21 receptors to the maximum extent feasible, given safety considerations. Lights will be
- 22 screened and directed downward toward work activities and will be screened and directed
- 23 away from the night sky and nearby residents to the maximum extent possible.
- 24 ● Design bridge and other vertical I-11 components to conform to the design standards
- 25 applicable to the entire corridor or to the special design standards in key locations where
- 26 these features can become visual resources.
- 27 ● Restore disturbed terrain and install replacement plantings in areas where vegetation is
- 28 removed. Replacement plantings will be native and indigenous to the area. Define the
- 29 storage sites for equipment, materials and stockpiles, and borrow sites in the Tier 2 project
- 30 plans. Site selection will consider and minimize visual impacts and will include screening to
- 31 minimize visual impacts, where appropriate. To minimize the impact of staging areas on
- 32 visual quality and character, return these areas to preconstruction conditions once the
- 33 staging facilities are decommissioned and removed.

34



1 **3.10 Air Quality**

2 **3.10.1 Summary of Draft Tier 1 EIS**

3 A qualitative air quality assessment was conducted to identify potential changes in vehicle
4 emissions, and the resulting potential changes in air quality, as a result of implementing the
5 Build Corridor Alternatives. The analysis is qualitative and does not include a detailed
6 quantitative evaluation of air quality emissions, which is consistent with a Tier 1 study. The
7 qualitative air quality assessment was completed by reviewing the results of the I-11 traffic
8 analysis as well as reviewing air quality State Implementation Plans relevant to the Study Area.

9 Air quality is regulated at the national level by the Clean Air Act of 1970 (CAA) (42 U.S.C. 7401
10 et seq.) as amended in 1977 and 1990. The US Environmental Protection Agency (USEPA) is
11 responsible for establishing National Ambient Air Quality Standards (NAAQS) for the following
12 six criteria pollutants: carbon monoxide (CO), ground-level ozone (O₃), nitrogen dioxide (NO₂),
13 sulfur dioxide, coarse and fine particulate matter (PM) (less than or equal to 10 microns [PM₁₀]
14 and less than or equal to 2.5 microns [PM_{2.5}]), and lead. Of the six NAAQS pollutants,
15 transportation sources contribute to CO, NO₂, PM, and O₃ (USEPA 2017b). USEPA works with
16 state and local jurisdictions to monitor ambient air levels for these pollutants. The State of
17 Arizona adopted the NAAQS for these criteria pollutants, which are summarized in **Table 3.10-**
18 **1.**

19 Federal regulations on vehicle emissions are expected to improve and further lower vehicle
20 emissions in the future. Air quality in the Study Area has steadily been improving as
21 demonstrated by the numerous decisions by USEPA that former nonattainment areas in the
22 Study Area are now in attainment with the NAAQS. Near Nogales, USEPA classified the area
23 as a moderate nonattainment area for PM_{2.5} and PM₁₀. The Rillito area is classified as a
24 moderate nonattainment area for PM₁₀. Phoenix Mesa and West Pinal areas are classified as
25 serious nonattainment areas for PM₁₀; these fall within the Green and Purple Alternatives. There
26 also is marginal nonattainment in Phoenix Mesa for O₃. The South Section transverses the
27 Tucson CO limited maintenance area.

28 Saguario National Park is designated as a Class 1 air shed. Class 1 air sheds are granted
29 special air quality protections under the CAA in areas such as national parks, national
30 wilderness areas, and national monuments where visibility is an important value. Transportation
31 sources do not significantly contribute to visibility impairment in these Class I areas (Arizona
32 Department of Environmental Quality [ADEQ] 2011).

33 The potential impacts to regional air quality are similar across the three Build Corridor
34 Alternatives. The Build Corridor Alternatives may impact local air quality conditions differently.
35 The Purple and Green Alternatives could lead to localized violations of CO, PM₁₀, and PM_{2.5} on
36 co-located SR 85 and/or I-10. The detailed quantitative analysis conducted in Tier 2 will identify
37 localized impacts to air quality.



1 **Table 3.10-1. National Ambient Air Quality Standards for Criteria Pollutants**

Pollutant/Averaging Time	Primary Standard ^a	Secondary Standard ^a
CO		
8-hour	9 ppm ^b	–
1-hour	35 ppm	–
Lead		
Rolling 3-Month Average	0.15 µg/m ³	0.15 µg/m ³
NO₂		
1-hour	100 ppb	–
Annual Arithmetic Mean ^c	53 ppb	53 ppb
O₃		
8-hour ^d	0.070 ppm	0.070 ppm
PM_{2.5}		
Annual	12 µg/m ³	15 µg/m ³
24-hour	35 µg/m ³	35 µg/m ³
PM₁₀		
24-hour	150 µg/m ³	150 µg/m ³
SO₂		
1-hour	75 ppb	–
3-hour	–	0.5 ppm

2 SOURCE: USEPA 2017b.

3 ppm = parts per million, µg/m³ = micrograms per cubic meter, ppb = parts per billion.

4 ^a Primary standards set limits to protect public health, including the health of sensitive populations, such as asthmatics, children, and
5 the elderly. Secondary standards set limits to protect public welfare, including protection against visibility impairment and damage to
6 animals, crops, vegetation, and buildings.

7 ^b Due to mathematical rounding, a measured value of 9.5 ppm or greater is necessary to exceed the standard.

8 ^c The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer
9 comparison to the 1-hour standard.

10 ^d Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.

11 **3.10.2 Summary of Changes Since Draft Tier 1 EIS**

12 Agency and public feedback on air quality focused on concerns with impacts, such as visibility
13 to Saguaro National Park, impacts to climate change and greenhouse gases, concerns with the
14 project being in compliance with NAAQS, and a general concern for the project increasing air
15 pollution in the Analysis Area. These air quality concerns did not result in changes to this Tier 1
16 analysis but would be addressed during the Tier 2 analysis.

17 **3.10.3 No Build Alternative**

18 Under the No Build Alternative, vehicles would continue to utilize the existing transportation
19 network in the Study Area. The county-to-county daily freight truck flows are expected to
20 increase at a range of 239 to 288 percent by 2040. Although truck emissions are improving over
21 time due to national emissions standards, increases in truck traffic along with increased



1 congestion would lead to a heightened risk of localized violations of NAAQS under the No Build
2 Alternative.

3 **3.10.4 Recommended Alternative**

4 The nonattainment and maintenance areas shown on **Figure 3.10-1** have not changed from
5 those mapped in the Draft Tier 1 EIS. The Recommended Alternative passes through the
6 Nogales PM₁₀ and PM_{2.5} moderate nonattainment areas, the Tucson CO limited maintenance
7 area, the Rillito PM₁₀ moderate nonattainment areas, the Phoenix Mesa and West Pinal PM₁₀
8 serious nonattainment area, and the Phoenix Mesa O₃ marginal nonattainment area. The figure
9 also displays the Saguaro National Park Class 1 air shed.

10 Quantitative studies that would take place during the more detailed Tier 2 analysis would focus
11 on sensitive receptors in Saguaro National Park and would highlight those differences between
12 the Recommended and Preferred Alternatives. An air quality conformity analysis to determine
13 whether the project conforms to the State Implementation Plan would be conducted in Tier 2.

14 **3.10.5 Preferred Alternative**

15 The Recommended and Preferred Alternatives would have similar impacts to regional air
16 quality.

17

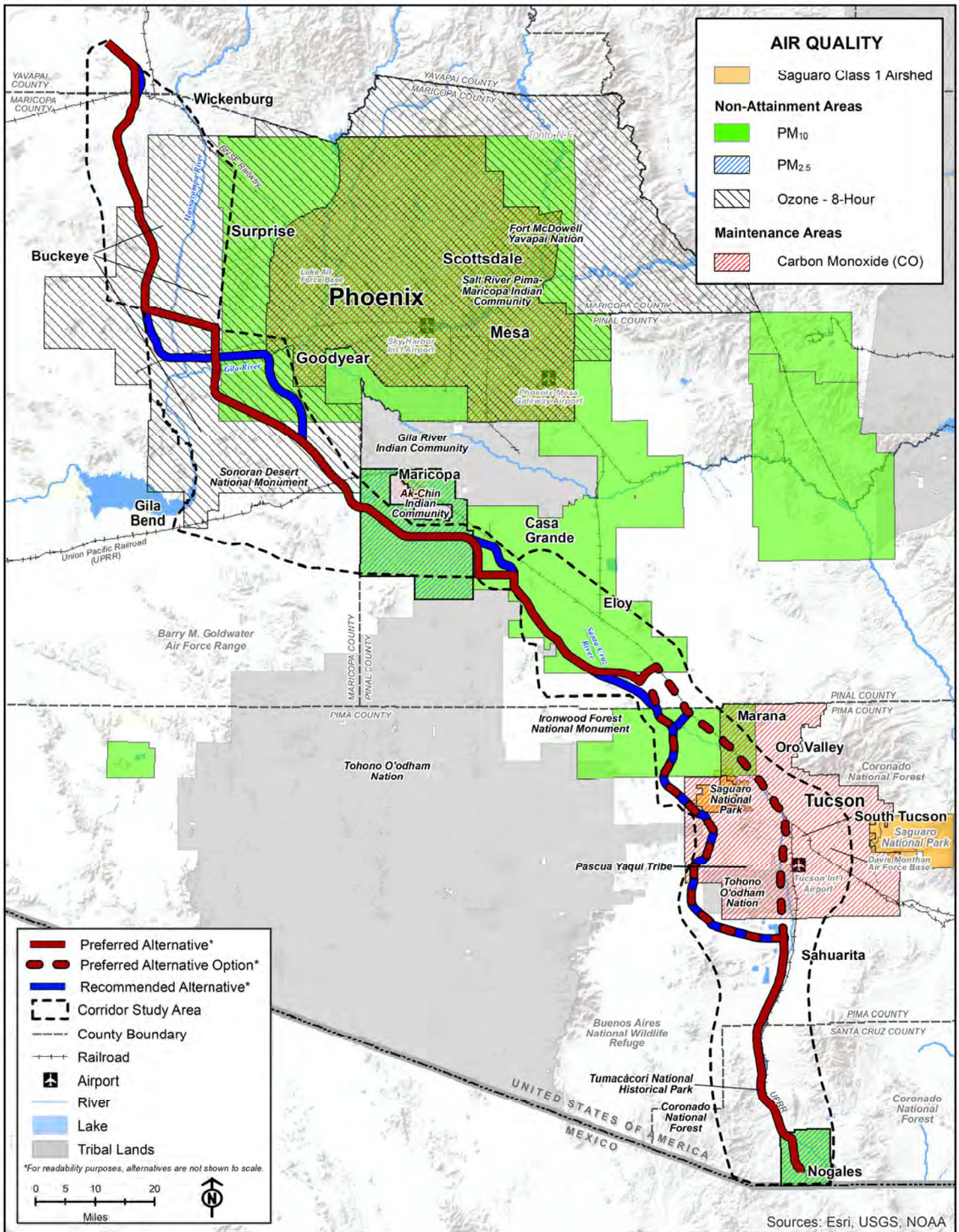


Figure 3.10-1. Nonattainment and Maintenance Areas along the Recommended and Preferred Alternatives



1 **3.10.6 Mitigation and Tier 2 Analysis**

2 **3.10.6.1 Tier 2 Analysis Commitments**

3 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
4 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
5 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
6 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
7 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate impacts to air quality.
8 Specifically, ADOT commits to carrying out the following analysis during the Tier 2 process:

- 9 • **T2-Air Quality-1:** Conduct a detailed air quality analysis for further environmental
10 evaluation. Transportation conformity analysis could be required based on the
11 nonattainment and maintenance designations of the areas surrounding the Study Area.
12 Attainment status for the applicable areas will be re-evaluated during Tier 2 analysis.
- 13 • **T2-Air Quality-2:** Assess vehicle emissions along the I-11 Corridor. Modeling of CO and PM
14 at the project level will be conducted to determine potential localized air quality effects
15 (hotspots) from future construction and operation of the I-11 Corridor.
- 16 • **T2-Air Quality-3:** Quantitatively assess greenhouse gas emissions using USEPA's Motor
17 Vehicles Emissions Simulator (MOVES) model or the model in place at the time of Tier 2
18 analyses.
- 19 • **T2-Air Quality-4:** Conduct an analysis of localized air quality impacts to sensitive areas,
20 including the Saguaro National Park. The analysis will assess NAAQS and criteria pollutants
21 and will consider the spacing of interchanges and associated idling impacts on adjacent
22 receptors. ADOT will provide the opportunity for NPS to review the air quality emission
23 inventory and modeling protocols.

24 **3.10.6.2 Mitigation to be Evaluated in Tier 2**

25 FHWA and ADOT will consider specific measures to avoid, minimize, and mitigate impacts to air
26 quality from the Project during Tier 2 studies. No specific mitigation measures pertaining to air
27 quality have been determined at this time. Examples of measures that ADOT may evaluate in
28 Tier 2 include:

- 29 • Minimize idling time to save fuel and reduce emissions.
- 30 • Use cleaner fuels for construction equipment and vehicles to reduce exhaust emissions.
- 31 • Keep construction equipment well-maintained to ensure that exhaust systems are in good
32 working order, and the exteriors are as clean of fugitive dust as possible.
- 33 • Control fugitive dust through a Fugitive Dust Control Plan, including watering disturbed
34 areas.
- 35 • To minimize wind-blown dust from blasting, particularly near community areas, control
36 blasting and avoid blasting on days with high winds.



- 1 • Develop a traffic plan to minimize traffic flow interference from construction equipment
2 movement and activities.
- 3 • Space interchanges to reduce local impacts of idling on sensitive areas near the new
4 corridor.
- 5 • Conduct analysis and implement other applicable local requirements, such as at the county-
6 level.
- 7



1 **3.11 Hazardous Materials**

2 **3.11.1 Summary of Draft Tier 1 EIS**

3 Hazardous materials include hazardous waste, hazardous substances, petroleum products, and
4 other regulated materials. The existing hazardous material sites were identified by searching for
5 facilities that were reported to various regulatory agencies within a prescribed search radius (by
6 facility type) from the centerline of the Build Corridor Alternatives, generally between 0.25 mile
7 and 1 mile – this is the hazardous materials analysis area. Over 800 regulated hazardous
8 materials sites were identified in the hazardous materials analysis area, including
9 Comprehensive Environmental Response, Compensation, and Liability Act-designated
10 contaminated sites (Superfund), hazardous waste, underground storage tanks, leaking
11 underground storage tanks, Voluntary Remediation Program and Brownfields, landfills, and
12 other facility types (GeoSearch 2017a–2017q).

13 The environmental consequences of the Build Corridor Alternatives would be similar. The
14 potential environmental consequences are two-fold:

- 15 • Human and environmental health risks associated with encountering hazardous materials
16 during construction
- 17 • Risk of a spill or accident on I-11 associated with the transportation of hazardous materials

18 **3.11.1.1 Encountering Hazardous Materials During Construction**

19 Encountering hazardous materials during construction can have negative environmental
20 consequences on human health and the environment due to direct exposure, or by inadvertently
21 distributing contaminants into surrounding soil, surface water, or groundwater. The sections of
22 the Build Corridor Alternatives that are co-located with existing roadway facilities would
23 generally result in a smaller construction footprint compared to a new alignment. Those sections
24 where co-location is anticipated tend to have a higher density of hazardous materials facilities,
25 particularly in highly developed urban areas. Undeveloped rural areas have a low density of
26 hazardous materials facilities. Draft Tier 1 EIS **Table 3.11-6**, **Table 3.11-7**, and **Table 3.11-8**
27 summarize the end-to-end considerations for the Purple, Green, and Orange Alternatives,
28 respectively. The No Build Alternative would not impact hazardous material sites.

29 **3.11.1.2 Risk of Spill or Accident on I-11**

30 Hazardous materials, as defined in 49 CFR 173.403, are transported through the Study Area on
31 existing transportation routes and could be transported on future transportation routes
32 associated with the Build Corridor Alternatives. The movement and use of hazardous materials
33 present exposure risks from accidental releases and spills. Additional risks could be introduced
34 where routes on new location expose sensitive receptors such as water resources, wildlife
35 habitat, or recreation resources to hazardous materials. Further, widening of existing roadways
36 may result in a slightly reduced distance of nearby receptors to hazardous materials being
37 transported on I-11.



1 The Arizona Department of Public Safety is charged with enforcing rules and regulations
2 governing the operation of vehicles transporting hazardous materials, especially as it relates to
3 49 U.S.C. Chapter 51 – Transportation of Hazardous Material and Section 5112, Highway
4 routing of hazardous material, which prescribe standards for states and tribal governments to
5 use in transporting hazardous material in commerce. Commercial Vehicle Enforcement districts
6 are located throughout the state, and safety is promoted through auditing, education, inspection,
7 and enforcement operations as dictated by state and federal regulations. In this way, Arizona
8 State Troopers are proactively mitigating accidental spills on highways.

9 Should a spill of hazardous material occur, the response would be carried out in accordance
10 with the *Arizona State Emergency Response and Recovery Plan* (Arizona Department of
11 Emergency and Military Affairs 2017). This plan is in compliance with the National Oil and
12 Hazardous Substances Pollution Contingency Plan (40 CFR 300). Additionally, many local
13 agencies and organizations have developed plans to address accidental releases and spills.

14 **3.11.2 Summary of Changes Since Draft Tier 1 EIS**

15 Agencies and the public expressed concerns about the transport of hazardous materials and the
16 potential to contaminate sensitive water resources. The City of Tucson is concerned in particular
17 that spills occurring on routes adjacent to the Preferred Alternative with west option near
18 Sandario Road could reach the Central Avra Valley Storage and Recovery Project (CAVSARP)
19 and Southern Avra Valley Storage and Recovery Project (SAVSARP) water recharge and
20 groundwater storage areas. Contamination of either the CAVSARP or SAVSARP would affect
21 the groundwater (specifically groundwater associated with the Tucson Active Management
22 Area). The risk of accidental spills into these specific water resources was not discussed in
23 **Section 3.11** (Hazardous Materials) of the Draft Tier 1 EIS. A commitment to evaluate
24 engineering solutions to contain spills in areas that have a high potential to drain to sensitive
25 receptors is included in **Section 3.11.6** (T2-HazardousMaterials-2). Accidental releases or spills
26 would be addressed by regulatory agencies under existing regulatory programs and/or plans.

27 **3.11.3 No Build Alternative**

28 Under the No Build Alternative, construction impacts would not occur. Vehicles transporting
29 hazardous materials would continue to use the existing transportation network and risks would
30 be similar to existing conditions. No new sensitive environmental resources would be exposed
31 to hazardous materials risks.

32 **3.11.4 Recommended Alternative**

33 Hazardous materials could be encountered during construction of the Recommended
34 Alternative, especially in urban areas and where the Recommended Alternative is co-located
35 with another facility. The potential to encounter hazardous materials is less in rural and
36 undeveloped areas than in urban areas. The potential of contamination from vehicles
37 transporting hazardous material would be similar to existing conditions along co-located
38 stretches and would introduce the potential for contamination along new stretches. Spills that
39 occur along the Recommended Alternative could impact recharge and storage basins in the
40 vicinity of CAVSARP and SAVSARP.



1 **3.11.5 Preferred Alternative**

2 Hazardous materials could be encountered during construction of the Preferred Alternative,
3 especially in urban areas and where the Preferred Alternative is co-located with another facility.
4 The potential to encounter hazardous materials is less in rural and undeveloped areas than in
5 urban areas. The potential of contamination from vehicles transporting hazardous material
6 would be similar to existing conditions along co-located stretches and would introduce the
7 potential for spills along new stretches. Spills that occur along the west option in Pima County
8 could impact recharge and storage basins in the vicinity of CAVSARP and SAVSARP.

9 **3.11.6 Mitigation and Tier 2 Analysis**

10 **3.11.6.1 Tier 2 Analysis Commitments**

11 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
12 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
13 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
14 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
15 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate impacts. Specifically,
16 ADOT commits to carrying out the following analysis during the Tier 2 process:

- 17 • **T2-HazardousMaterials-1:** Conduct detailed hazardous materials evaluations, including
18 review of regulatory agency files; subsurface investigations to quantify the vertical and
19 horizontal distribution of hazardous materials; and remediation planning as needed.
- 20 • **T2-HazardousMaterials-2:** Evaluate engineering solutions to contain spills in areas that
21 have a high potential to impact sensitive receptors, including water resources, groundwater
22 recharge areas, wildlife habitat, and recreation resources.

23 **3.11.6.2 Mitigation Commitments**

24 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
25 impacts from the Project (generally referred to as mitigation measures) during this Tier 1
26 process. Specific mitigation that ADOT is committing to implement if a Build Alternative is
27 selected includes:

- 28 • **MM-HazardousMaterials-1:** Prior to construction, prepare and implement a project-specific
29 Health and Safety Plan and Hazardous Materials Management Plan to address potential
30 hazardous materials that could be encountered. These plans will consist of specific
31 measures to protect worker and public health and safety, as well as programs to manage
32 contaminated materials during construction.
- 33 • **MM-HazardousMaterials-2:** If unknown contaminated media is encountered during
34 construction, stop working until the contamination is properly evaluated and measures are
35 developed to protect worker health and safety in accordance with the project-specific Health
36 and Safety Plan and Hazardous Materials Management Plan.
- 37 • **MM-HazardousMaterials-3:** Identify practical measures to avoid, minimize, and mitigate the
38 environmental consequences from hazardous materials.



- 1 • **MM-HazardousMaterials-4:** Implement preparedness plans, such as the *Arizona State*
2 *Emergency Response and Recovery Plan* (Arizona Department of Emergency and Military
3 Affairs 2017).

4 **3.11.6.3 Additional Mitigation to be Evaluated in Tier 2**

5 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
6 above, to include best practices, permit requirements, and/or other mitigation strategies
7 suggested by agencies or the public. Examples of mitigation measures that ADOT may evaluate
8 in Tier 2 include:

- 9 • Avoid contaminated sites wherever practical; where impractical, initiate further site
10 investigation and coordination with affected property owners.
- 11 • Conduct surveys for asbestos, lead-based paint, and universal wastes prior to demolition of
12 any building structures and bridges or elevated structures. If these regulated materials are
13 encountered, abate them in accordance with applicable regulations and guidelines.
- 14 • Implement standard construction measures for fugitive dust control, as well as stormwater
15 erosion and sediment controls, to minimize the spread of contaminated soil. During the
16 construction phase, require the contractor to file and abide by a dust management plan to
17 minimize the effects of dust on surrounding communities.
- 18 • Comply with local, state, and federal regulations regarding the storage and use of
19 hazardous materials on the site.
- 20 • Consider alignments that place the new highway facility farther away from sensitive
21 resources, such as CAVSARP and SAVSARP.
- 22 • Consider engineering solutions in areas where accidental spills could impact irrigation
23 facilities, water wells, or other water resources, such as lined catchment basins.
- 24 • Incorporate best management practices designed to reduce erosion, minimize
25 sedimentation, and eliminate non-stormwater pollutants as identified in ADOT's *Erosion and*
26 *Pollution Control Manual for Highway Design and Construction* (ADOT 2012) and ADOT's
27 *Standard Specifications for Road and Bridge Construction* (ADOT 2008). (The most recent
28 versions of these design standards will apply during Tier 2 analysis.) Restrictions and
29 requirements that would be considered are further discussed in **Section 3.13** (Water
30 Resources).

31



1 **3.12 Geology, Soils, and Prime and Unique Farmlands**

2 **3.12.1 Summary of Draft Tier 1 EIS**

3 The impacts associated with geology, soils, and prime and unique farmlands would be similar
4 for the Build Corridor Alternatives. Each Build Corridor Alternative would encounter geologic
5 features and soils that would impact the design and construction process. All Build Corridor
6 Alternatives would impact agricultural lands through direct conversion during construction. As
7 part of the Tier 2 analysis, field investigations will determine the exact resource characteristics
8 and how to avoid, minimize, and mitigate associated effects during the design process.

9 Potential effects of the project on surface and near surface geologic resources, soils, and prime
10 and unique farmlands would be similar for all Build Corridor Alternatives. Potential effects
11 include the following:

- 12 • Loss of geologic material (rock or soil) through removal
- 13 • Loss of access to surface geologic material as part of the construction process (i.e.,
14 covering by pavements or improved right-of-way areas)
- 15 • Cut slope instability
- 16 • Loss of soil through removal
- 17 • Loss of access to soil by covering
- 18 • Loss of soil by water and wind erosion
- 19 • Reduced soil stability by disturbance
- 20 • Direct conversion of farmland
- 21 • Cumulative impacts by isolation of remnant parcels
- 22 • Indirect (secondary) impacts resulting from the acquisition of adjacent land

23 Excavation and removal of existing geologic materials and soils would be required for
24 construction. This would result in loss of native materials from the environment. Access to
25 surface and near-surface geologic materials and soils would be lost following construction of
26 roadway pavements, bridge and wall structures, and other coverings such as engineered fills
27 and landscape materials. Slopes resulting from excavations and fills would be designed in Tier 2
28 to mitigate erosion-prone or unstable slope conditions. Operation and maintenance of a new or
29 expanded roadway system as the result of a Build Corridor Alternative would generally not be
30 expected to affect the geology or soil resources within the Project Area.

31 Prime and unique farmlands occupy portions of all the Build Corridor Alternatives. Direct
32 conversion of farmland would occur through construction of the project. Agricultural parcels
33 bisected by the project would result in separated parcels, which might become too isolated or



1 too small for continued economic use and/or result in the need to transport equipment using the
2 existing local road network to gain access to opposite sides of the project. If prudent, a grade-
3 separated crossing could be provided for access between separated parcels. Potential
4 mitigation is further discussed in **Section 3.12.6**. Land adjacent to the project would likely be
5 developed, which could result in loss of agricultural land.

6 **3.12.2 Summary of Changes Since Draft Tier 1 EIS**

7 BLM provided two comments on the geology section of the Draft Tier 1 EIS as contained in the
8 DOI review comments letter dated July 8, 2019, BLM Comments 25 and 26. See **Appendix H**
9 (Comments on Draft Tier 1 EIS and Responses) for the full comments and responses.

10 BLM indicated that the Build Corridor Alternatives are expected to have minimal to negligible
11 impacts to salable and locatable minerals, respectively. Except for impacts to the existing
12 access to one aggregate operation located in Township 2 South, Range 3 West, Section 12, no
13 adverse impacts to salable minerals are expected. Rather, the project is expected to create
14 demand for and enhance access to and movement of salable minerals to customers. The
15 project is expected to have negligible impact to locatable minerals because the Build Corridor
16 Alternatives either avoid areas of high locatable mineral potential or cross such areas where no
17 active locatable mineral operations exist and avoid creating new disturbance to previously
18 mined/prospected areas.

19 As discussed in **Section 3.12.6.1**, active mining operations will be analyzed in detail in the Tier
20 2 process.

21 **3.12.3 No Build Alternative**

22 The No Build Alternative would not impact geology, soil, or prime and unique farmlands. Urban
23 growth of metropolitan areas encompassed by the Project Area over the long term is projected
24 to continue and expected to impact geology, soil, or prime and unique farmlands through
25 conversion to residential, commercial, and industrial uses. These are considered indirect and
26 cumulative effects and are further discussed in **Section 3.17** (Indirect and Cumulative Effects).

27 **3.12.4 Recommended Alternative**

28 Between Sahuarita and Marana, the Recommended Alternative would encounter bedrock earth
29 fissures and would encounter more prime and unique farmland than the west option of the
30 Preferred Alternative due to the location of the I-10 connection for the Recommended
31 Alternative. The Recommended Alternative would also cross less prime and unique farmland
32 between Casa Grande and Buckeye than the Preferred Alternative. There are no substantial
33 differences between the Recommended and Preferred Alternatives in any of the other
34 geographies.

35 **3.12.5 Preferred Alternative**

36 Between Sahuarita and Marana, the west option would encounter bedrock earth fissures and
37 the east option would not. Both the east and west options of the Preferred Alternative would
38 cross more prime and unique farmland between Sahuarita and Marana, and between Casa



1 Grande and Buckeye, than the Recommended Alternative. There are no substantial differences
2 between the Recommended and Preferred Alternatives in any of the other geographies.

3 **3.12.6 Mitigation and Tier 2 Analysis**

4 **3.12.6.1 Tier 2 Analysis Commitments**

5 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
6 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
7 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
8 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
9 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate geology, soils, and
10 farmland impacts. Specifically, ADOT commits to carrying out the following analysis during the
11 Tier 2 process:

- 12 • **T2-Soils-1:** Identify and review regulations related to geologic resources based on local land
13 ownership and the intended use.
- 14 • **T2-Soils-2:** As part of design and geotechnical investigations, determine the amount of
15 ground disturbance anticipated and factors that affect the potential for soils to erode by
16 water and wind, including physical characteristics, slope gradient, vegetative cover, surface
17 roughness, and rainfall or wind intensity.
- 18 • **T2-Soils-3:** Evaluate existence and status of mining claims and active mining operations.
- 19 • **T2-Soils-4:** Identify and determine the extent of impacts to specific geologic, soil, and
20 farmland resources.
- 21 • **T2-Soils-5:** Conduct site-specific field investigations during design to validate interpretations
22 and confirm soil characteristics.
- 23 • **T2-Soils-6:** Collect any additional or refined data (NRCS, USGS, or other sources) on
24 geotechnical conditions that could affect design and performance such as shrink/swell,
25 compression/collapse, and corrosion potential.
- 26 • **T2-Soils-7:** Identify the number of irrigated acres for refinement of potential prime or unique
27 farmland impacts through NRCS completion of USDA Form AD-1006 (Farmland Conversion
28 Impact Rating form).
- 29 • **T2-Soils-8:** Identify areas of current and planned development that should be removed from
30 prime and unique farmland categorization through the analysis of local land use and zoning
31 maps.

32 **3.12.6.2 Mitigation Commitments**

33 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
34 geology, soils, and farmland impacts from the Project (generally referred to as mitigation
35 measures) during this Tier 1 process. Specific mitigation that ADOT is committing to implement
36 if a Build Alternative is selected includes:



- 1 • **MM-Soils-1:** Monitor disturbance and erosion areas during construction and through
2 restoration.
- 3 • **MM-Soils-2:** Avoid known land subsidence areas when feasible.
- 4 • **MM-Soils-3:** Avoid known earth fissures when feasible.
- 5 • **MM-Soils-4:** Develop and implement a reclamation and revegetation plan.
- 6 • **MM-Soils-5:** Coordinate with NRCS as part of compliance with the Farmland Protection
7 Policy Act.

8 **3.12.6.3 Additional Mitigation to be Evaluated in Tier 2**

9 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
10 above, to include best practices, permit requirements, and/or other mitigation strategies
11 suggested by agencies or the public. Examples of measures that ADOT may evaluate in Tier 2
12 include:

- 13 • Avoid steep slopes and known bedrock outcrops.
- 14 • Evaluate and design for safe, stable excavated slopes in bedrock.
- 15 • Design to avoid or mitigate geotechnical-related construction constraints.
- 16 • Design and excavate slopes in accordance with accepted practices.
- 17 • Design and place fills in accordance with accepted safety practices.
- 18 • Protect excavation and fill slopes against erosion.
- 19 • Design subgrade and foundations in accordance with accepted practices.
- 20 • Monitor potential erosion or settlement areas during construction and through restoration.
- 21 • Develop and implement dust control and erosion control strategies.
- 22 • Stockpile topsoil for use in reclamation.
- 23 • Protect excavation and fill slopes against erosion.
- 24 • Design alignment within or near existing linear transportation features or planned urban
25 areas to avoid agricultural areas.
- 26 • Work with local landowners to facilitate land swaps and purchases as applicable to avoid
27 fragmented parcels with barriers to equipment access.
- 28 • Provide access for farm equipment between divided agricultural parcels, where feasible.

29



1 3.13 Water Resources

2 This section addresses the potential effects of the I-11 No Build and Build Corridor Alternatives
3 on water resources. Assessed categories of water resources include active management areas,
4 sole source aquifers, groundwater wells, Outstanding Arizona Waters, impaired waters, waters
5 of the US including wetlands, and floodplains. Quantities of the resources within each
6 2,000-foot-wide Build Corridor Alternative are identified and impacts are evaluated using a
7 combination of quantitative and qualitative assessments. Mitigation measures and analyses that
8 would be conducted during Tier 2 NEPA reviews are described.

9 This section does not follow the condensed format used for the other sections in **Chapter 3**
10 (Affected Environment and Environmental Consequences). This section is a republication of
11 information presented in the Draft Tier 1 EIS plus an evaluation of the Recommended and
12 Preferred Alternatives. Some subsections have been reorganized to improve document clarity.
13 Additionally, certain analyses and discussions have been updated to include additional
14 information. Major changes from the Draft Tier 1 EIS include:

- 15 • Separation of active management areas, sole source aquifers, and Outstanding Arizona
16 Waters into separate subsections. These resources were addressed under “Sensitive Water
17 Resources” in the Draft Tier 1 EIS.
- 18 • Revision of the groundwater wells analysis to include all wells. The Draft Tier 1 EIS analysis
19 was limited to high-capacity wells. The title of the “Groundwater Resources” subsection has
20 been changed to “Groundwater Wells” (**Section 3.13.3.3**).
- 21 • Update of the impaired waters analysis to include impaired waters within 0.5 mile upstream
22 and 1.0 mile downstream of each Build Corridor Alternative. The Draft Tier 1 EIS analysis
23 included impaired waters within 0.5 mile of the Build Corridor Alternatives.
- 24 • Revision of the waters of the US analysis to include unnamed watercourses.
- 25 • Update of the wetlands analysis to exclude riverine wetlands and to add a new analysis of
26 key potential wetlands where site-specific reviews were conducted.

27 Refer to **Section 3.13.2** for additional information regarding the analysis of these water
28 resources.

29 3.13.1 Regulatory Setting

30 This section contains a brief explanation of the federal, state, and local regulations pertinent to
31 activities that may impact water resources within the I-11 Study Area.

32 3.13.1.1 Federal

33 Clean Water Act (CWA) of 1972

34 The goal of the CWA (33 U.S.C. Section 1251 et seq.) is “to restore and maintain the chemical,
35 physical, and biological integrity of the Nation’s waters.” Waters of the US regulated under the



1 CWA include traditional navigable waters, their tributaries, and adjacent wetlands (33 CFR
2 328.3).

3 On April 21, 2020, USACE and USEPA published a rule revising the definition of waters of the
4 US (40 Federal Register 22250-22342). Under the April 2020 rule, waters of the US subject to
5 regulation under the CWA include the territorial seas and traditional navigable waters, perennial
6 and intermittent tributaries that contribute surface water flow to the territorial seas and traditional
7 navigable waters in a typical year, and wetlands adjacent to other waters of the US. Ephemeral
8 tributaries and their adjacent wetlands are not subject to regulation under the CWA per the April
9 2020 rule. As defined in 40 Federal Register 22338-22339, ephemeral surface water flows or
10 pools only in direct response to precipitation such as rain or snowfall. Intermittent surface water
11 flows continuously during certain times of the year and more than in direct response to
12 precipitation. Perennial surface water flows continuously year-round.

13 The CWA establishes the basic structure for regulating discharges of pollutants into waters of
14 the US and regulating quality standards for surface waters through Sections 404, 401, 402, and
15 303(d) of the Act.

16 **Section 404** of the CWA establishes a program to regulate the discharge of dredged or fill
17 material into waters of the US. A permit is required for such discharges, unless the activity is
18 exempt from regulation (33 U.S.C. Section 1344). No discharge of dredged or fill material may
19 be permitted if there is a practicable alternative to the proposed discharge that would have less
20 adverse impact on the aquatic ecosystem so long as the alternative does not have other
21 significant adverse environmental impacts (40 CFR 230.10). In other words, the selected
22 alternative must be the least environmentally damaging practicable alternative. Impacts on the
23 aquatic ecosystem considered by USACE are outlined in the CWA Section 404(b)(1) guidelines
24 and include effects to substrate, suspended particulates/turbidity, water, current patterns and
25 water circulation, normal water fluctuations, salinity gradients, threatened and endangered
26 species, aquatic organisms, and other wildlife (40 CFR 230).

27 Jurisdictional wetlands are regulated as special aquatic sites and are given special
28 consideration in the Section 404 permitting process (40 CFR 230.41 and 230.3). Wetlands are
29 defined as areas that are inundated or saturated by surface or groundwater at a frequency and
30 duration sufficient to support, and that under normal circumstances do support, a prevalence of
31 vegetation typically adapted for life in saturated soil conditions. All practicable alternatives that
32 do not involve discharges into wetlands are generally considered to have less adverse impact
33 on the aquatic ecosystem. As such, projects with proposed impacts on wetlands must
34 demonstrate that no practicable alternative exists that would not impact wetlands.

35 In most states including Arizona, the CWA Section 404 program is administered by USACE.
36 USEPA is responsible for program policy, scope, and oversight. For activities subject to CWA
37 Section 404 permitting, USACE requires compensatory mitigation for the purpose of offsetting
38 unavoidable loss of aquatic resources. Specific mitigation requirements can include aquatic
39 resource restoration, establishment, enhancement, or preservation, which may be conducted
40 directly by the project proponent or achieved through use of in-lieu fee programs and mitigation
41 banks.

42 Under **Section 401** of the CWA, a federal agency may not issue a permit to conduct any activity
43 that may result in a discharge to waters of the US unless a state or authorized tribe where the
44 discharge would occur issues a water quality certification or waives the certification requirement



1 (33 U.S.C. Section 1341). Certification decisions are based on whether the activity would
2 comply with state or tribal water quality standards, effluent limitations, and other applicable
3 water quality requirements. In Arizona, Section 401 certification is administered by ADEQ if the
4 action is entirely on non-tribal lands. If any portion of the action occurs within or affects waters of
5 the US on tribal lands, the Section 401 certification would be obtained from either USEPA or the
6 respective tribe.

7 **Section 402** of the CWA formed the National Pollutant Discharge Elimination System (NPDES),
8 which regulates pollutant discharges, including stormwater, into waters of the US. NPDES
9 permits set specific discharge limits for point source pollutants and outline special conditions
10 and requirements for projects to reduce water quality impacts (33 U.S.C. Section 1342). Permits
11 require that projects be designed to protect waters of the US. Construction projects that will
12 disturb more than 1 acre of land must comply with the requirements of the NPDES Construction
13 General Permit, which, among other provisions, requires preparation and implementation of a
14 Stormwater Pollution Prevention Plan (ADEQ 2013b). NPDES permits on non-tribal lands in
15 Arizona are administered by the state under the Arizona Pollutant Discharge Elimination System
16 (AZPDES). Pollutant discharges on tribal lands must be permitted through USEPA Region 9.

17 Section 402(p) of the CWA also falls under NPDES and requires implementation of controls for
18 discharges from industrial activities and municipal separate stormwater sewer systems (MS4s).
19 Two types, or “phases,” of MS4s are defined under NPDES and are permitted depending on the
20 size and type of the MS4. Phase I regulations (64 Federal Register 68722) require discharges
21 from large construction sites, certain industrial activities, and operators of “medium” or “large”
22 MS4s (those that serve a population of 100,000 or greater), to obtain a permit and implement a
23 stormwater management program. The Phase II regulations (64 Federal Register 68722)
24 require smaller operators to obtain a permit for their stormwater discharges. Phase II MS4s can
25 be any MS4 that does not meet the definition of a medium or large MS4 and can include state
26 departments of transportation and military bases, among other entities. Both types of permits
27 require controls to reduce the discharge of pollutants to the maximum extent practicable. ADEQ
28 was delegated authority to implement AZPDES permitting for MS4 operators in 2002.

29 **Section 303(d)** of the CWA requires states, territories, and authorized tribes to develop a list of
30 water quality-impaired segments of waterways (33 U.S.C. Section 1313(d)). The Section 303(d)
31 list includes waterbodies that do not meet water quality standards for the specified beneficial
32 uses of that waterway and ranks the waterbodies by priority. Section 303(d) requires
33 jurisdictions to develop total maximum daily loads for all the waters identified on their impaired
34 waters list in order of priority. The objective of a total maximum daily load is to determine the
35 loading capacity of the waterbody and to allocate that load among different pollutant sources so
36 that the appropriate control actions can be taken and water quality standards achieved. Certain
37 waters assessed as impaired are not placed on the Section 303(d) list because a total maximum
38 daily load has already been implemented for the water, an action is occurring that is expected to
39 bring the water to attainment before the next Section 303(d) list submission, or the impairment
40 of the water is due to a pollutant for which a total maximum daily load allocation cannot be
41 developed; such waters are classified as not attaining (Arizona Administrative Code [AAC]
42 18-11). Impacts on impaired waters are considered in ADEQ’s CWA Section 401 water quality
43 certification decision process.



1 **Rivers and Harbors Act of 1899**

2 USACE, in partnership with various stakeholders, has constructed many civil works projects
3 across the nation. Given the widespread locations of these projects, many embedded within
4 communities, over time there may be a need for others outside of USACE to alter or occupy
5 these projects and their associated lands. To ensure that these projects continue to provide
6 their intended benefits to the public, Section 14 of the Rivers and Harbors Act (33 U.S.C.
7 Section 408) requires that any use or alternation of a USACE civil works project by another
8 party is subject to USACE approval. USACE may grant permission for another party to alter a
9 civil works project upon a determination that the alteration proposed will not be injurious to the
10 public interest and will not impair the usefulness of the project.

11 **Federal Regulation of Land Development in Flood Control Basins**

12 Under Policy Guidance Letter No. 32, Use of Corps Reservoir Flowage Easement Lands, no
13 structure may be constructed or maintained and no excavation or landfill may be placed on
14 flowage easement lands without USACE approval (USACE 1993). Flowage easement land is
15 privately owned land on which USACE has acquired certain perpetual rights, such as the right to
16 flood the land in connection with the operation of a reservoir.

17 USACE is responsible for water control management at the reservoir projects it owns and
18 operates as well as at certain non-USACE projects. Water control management is conducted
19 pursuant to Engineer Regulation 1110-2-240, Water Control Management (USACE 2016).

20 **National Flood Insurance Program**

21 The Federal Emergency Management Agency (FEMA) issues flood zone maps on a countywide
22 level. Among other provisions, the National Flood Insurance Program regulations state that if an
23 area of construction is located within a regulatory floodway, as delineated on the Flood
24 Insurance Rate Map, it must not increase base flood elevation levels (44 CFR Section 59-65).

25 **Department of Transportation (DOT) Order 5650.2, Floodplain Management and**
26 **Protection**

27 The purpose of DOT Order 5650.2 is to ensure that proper consideration is given to the
28 avoidance and mitigation of adverse floodplain impacts by DOT actions, planning programs, and
29 budget requests (US Department of Transportation [USDOT] 1979). Among other requirements,
30 DOT Order 5650.2 requires review of the risk to, or resulting from, the transportation action;
31 impacts on natural and beneficial floodplain values; and the degree to which the action provides
32 direct or indirect support for development in the base floodplain. The review must include
33 methods proposed to minimize harm and, where practicable, to restore and preserve floodplain
34 values. Where DOT proposes to conduct, support, or allow an action involving a significant
35 encroachment, the review document must consider alternatives to avoid the encroachment. A
36 significant encroachment cannot be approved unless the proposed action is found to be the only
37 practicable alternative. FHWA procedures regarding floodplain management are codified at
38 23 CFR 650 Subpart A.



1 **Executive Order (EO) 11988, Floodplain Management**

2 EO 11988 requires federal agencies “to avoid, to the extent possible, the long- and short-term
3 adverse impacts associated with the occupancy and modification of floodplains, and to avoid
4 direct and indirect support of floodplain development wherever there is a practicable alternative”
5 (42 Federal Register 26951). This EO requires agencies to evaluate the potential effects of any
6 actions it may take in a floodplain. When a proposed action will impact a floodplain, the agency
7 must consider alternatives to avoid adverse impacts. If the agency finds that the only practicable
8 alternative would result in floodplain impacts, the agency must design or modify the action to
9 minimize harm to the floodplain and provide an explanation of why the action must occur within
10 a floodplain. FHWA procedures regarding floodplain management are codified at 23 CFR 650
11 Subpart A.

12 **EO 13690, Establishing a Federal Flood Risk Management Standard and a Process for**
13 **Further Soliciting and Considering Stakeholder Input**

14 EO 13690 amended EO 11988 to improve the Nation’s resilience to current and future flood risk
15 and established the Federal Flood Risk Management Standard (80 Federal Register 6425).
16 EO 13690 guides agencies to use a higher flood elevation and expanded flood hazard area than
17 the base flood to ensure that future changes are adequately accounted for in agency decisions.
18 Another requirement is that federal agencies should use, where possible, natural systems,
19 ecosystem processes, and nature-based approaches in federal actions and alternatives.

20 **EO 11990, Protection of Wetlands**

21 EO 11990 requires that “Each agency shall provide leadership and shall take action to minimize
22 the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and
23 beneficial values of wetlands in carrying out the agency’s responsibilities” and, per NEPA, “shall
24 avoid undertaking or providing assistance for new construction located in wetlands unless the
25 head of the agency finds (1) that there is no practicable alternative to such construction, and (2)
26 that the proposed action includes all practicable measures to minimize harm to wetlands which
27 may result from such use. In making this finding the head of the agency may consider
28 economic, environmental and other pertinent factors” (42 Federal Register 26961).

29 **Safe Drinking Water Act of 1974**

30 The Safe Drinking Water Act authorizes USEPA to set national health-based standards for
31 drinking water to protect against both naturally occurring and manmade contaminants that may
32 be found in drinking water (42 U.S.C. Section 300f et seq.). National Primary Drinking Water
33 Standards are described in 40 CFR Part 141. In Arizona, the Safe Drinking Water Act standards
34 are administered by ADEQ if the action is entirely on non-tribal lands.

35 The Safe Drinking Water Act provides special protections for drinking water supplies in areas
36 where there are few or no alternative sources to the groundwater resource and where, if
37 contamination occurred, using an alternative source would be extremely expensive (USEPA
38 2016). Such areas may be designated as a sole source aquifer, which USEPA defines as an
39 area where (1) the aquifer supplies at least 50 percent of the drinking water for its service area
40 and (2) there are no reasonably available alternative drinking water sources should the aquifer
41 become contaminated. USEPA is authorized by Section 1424(e) of the Safe Drinking Water Act
42 of 1974 (76 Federal Register 19261) to review federally funded proposed projects within sole



1 source aquifers. The purpose of the review is to determine whether the project has the potential
2 to contaminate the sole source aquifer.

3 **Fish and Wildlife Coordination Act of 1934**

4 The Fish and Wildlife Coordination Act requires federal agencies to consult with the US Fish
5 and Wildlife Service (USFWS) before undertaking or approving water projects that would control
6 or modify surface water (16 U.S.C. Section 662).

7 **3.13.1.2 State**

8 **Groundwater Management Act of 1980**

9 The 1980 Groundwater Management Act recognized the need to aggressively manage the
10 state's groundwater resources to support the economy and general welfare of the state and its
11 citizens (Arizona Revised Statutes 45-401 et seq.). The three primary goals of the act are to
12 (1) control severe overdraft occurring in many parts of the state, (2) provide a means to allocate
13 the state's limited groundwater resources to most effectively meet the changing needs to the
14 state, and (3) augment Arizona's groundwater through water supply development.

15 Areas with heavy reliance on mined groundwater were identified and designated as active
16 management areas. Five active management areas have been established to date: Phoenix,
17 Tucson, Prescott, Pinal, and Santa Cruz. Each active management area carries out a
18 groundwater management program consistent with the overall goals of the Groundwater
19 Management Act while considering and incorporating the unique character of each active
20 management area and its water users. Goals of each active management area include
21 achieving or maintaining safe-yield, which is accomplished when no more groundwater is being
22 withdrawn than is being replaced annually.

23 **Underground Water Storage and Recovery Program of 1986 and Underground Water** 24 **Storage, Savings, and Replenishment Act of 1994**

25 The Underground Water Storage and Recovery Program and the Underground Water Storage,
26 Savings, and Replenishment Act together define the groundwater recharge program for Arizona
27 (Arizona Revised Statutes 45-801 et seq.; AAC R12-12-151). The purpose of the recharge
28 program is to (1) encourage the use of renewable water supplies, particularly Colorado River
29 water, instead of groundwater by establishing a regulatory program for the underground
30 storage, savings, and replenishment of water; and (2) allow for the efficient and cost-effective
31 management of water supplies by using underground storage facilities for filtration and
32 distribution of surface water instead of constructing surface water treatment plants and pipeline
33 distribution systems.

34 **Outstanding Arizona Waters**

35 AAC R18-11-112 defines Outstanding Arizona Waters. These are waters that meet the following
36 conditions: A surface water that is perennial or intermittent, free-flowing, has water quality that
37 meets or is better than applicable water quality standards, and meets one or both of the
38 following: (1) The surface water is of exceptional recreational or ecological significance or
39 (2) threatened or endangered species are known to be associated with the waterbody and
40 maintenance and protection of existing water quality is essential to the maintenance of the



1 threatened or endangered species, or the surface water provides critical habitat (AAC R18-11-
2 112[D]; ADEQ 2017b).

3 Site-specific standards may be developed by the state to maintain and protect existing water
4 quality within designated Outstanding Arizona Waters. Impacts on Outstanding Arizona Waters
5 are considered in ADEQ's CWA Section 401 water quality certification decision process.

6 **Water Quality Standards**

7 Arizona has adopted water quality standards for surface waters and aquifers (AAC 18-11
8 Articles 1 and 4). Water quality standards have been set for various designated uses of surface
9 waters (AAC 18-11-104). These designated uses have been assigned to specific surface waters
10 and are used in ADEQ's compliance with Section 303(d) of the CWA. Arizona has incorporated
11 specific safe drinking water regulations with the goals of protecting the public health and welfare
12 as well as maintaining the state's enforcement responsibility of the Safe Drinking Water Act
13 (AAC 18-4-101 et seq.).

14 **3.13.1.3 Local**

15 County flood control districts and incorporated municipalities require a Floodplain Use Permit in
16 cases where a project encroaches into a floodplain. Specific permitting requirements vary by
17 jurisdiction. Approval of a Floodplain Use Permit typically requires development of a hydraulic
18 computer model to demonstrate that structures, berms, or other facility components located
19 within the floodplain will not result in increased potential for flooding or erosion. This level of
20 detail is not available at this stage of the planning process and will be addressed, as
21 appropriate, during Tier 2 NEPA studies. The following county flood control districts and
22 municipalities would evaluate the need for and review any Floodplain Use Permits during a Tier
23 2 project assessment. Additional jurisdictions would also be identified during Tier 2 assessment.

- 24 • City of Tucson
- 25 • Flood Control District of Maricopa County
- 26 • Pima County Regional Flood Control District
- 27 • Pinal County Flood Control District
- 28 • Santa Cruz County Flood Control District
- 29 • Town of Marana
- 30 • Town of Oro Valley
- 31 • Town of Sahuarita
- 32 • Yavapai County Flood Control District

33 ADEQ requires Phase I MS4 permits for operators that serve populations greater than 100,000
34 (ADEQ 2017c). Operators holding MS4 permits within the Study Area include ADOT, Pima
35 County, City of Phoenix, and City of Tucson. Each permittee implements its own MS4 program



1 under its AZPDES permit. MS4 permittees must develop individual programs to manage and
2 treat stormwater discharges to the maximum extent practicable. For example, ADEQ issued the
3 ADOT MS4 Permit on July 17, 2015, with an effective date of August 16, 2015. ADOT's
4 Stormwater Management Plan identifies the program and procedures implemented by ADOT to
5 minimize, to the extent practicable, the release of pollutants to, and the discharge of pollutants
6 from, the ADOT MS4 (ADOT 2017b). Pima County developed a Stormwater Management
7 Program to ensure the quality of stormwater discharges were managed to the maximum extent
8 practicable (Pima County 2015b), and the City of Tucson passed Stormwater Management
9 Ordinance Number 10209 in 2005 (City of Tucson 2005).

10 The Pima County Department of Environmental Quality and the Maricopa County Environmental
11 Services Department have been delegated authority from ADEQ to administer provisions of the
12 federal Safe Drinking Water Act and Arizona's safe drinking water regulations (AAC 18-4 and
13 18-5) applicable to public water systems with their jurisdictions (ADEQ 2019). These counties
14 implement permitting, inspection, and enforcement programs for the construction, operation,
15 and closure of public water systems with oversight from ADEQ.

16 3.13.2 Methodology

17 Water resources addressed in this analysis include those that are regulated under federal, state,
18 or local law, as well as resources that were otherwise identified as being of special concern.
19 Assessed categories of water resources include active management areas, sole source
20 aquifers, groundwater wells, Outstanding Arizona Waters, impaired waters, waters of the US
21 including wetlands, and floodplains. Further details regarding the analysis methodology are
22 provided in **Appendix E13** (Water Resources Technical Memorandum).

23 For most resources, each 2,000-foot-wide Build Corridor Alternative was overlaid on geospatial
24 data to quantify the resource and to identify its location(s) within the corridor. The 2,000-foot-
25 wide corridors are collectively referred to as the Project Area. Modified approaches were used
26 to identify and describe impaired waters and wetlands. Data sources and approach for each
27 category of water resources are described below.

28 **Active management areas** were identified using the Arizona Department of Water Resources'
29 (ADWR) Water Atlas (ADWR 2010) and geospatial data acquired from ADWR (2020).

30 **Sole source aquifers** were identified using geospatial data acquired from USEPA (2017a).

31 **Groundwater wells** were identified using an inventory of wells compiled by ADWR (2017).

32 **Outstanding Arizona Waters** were identified using geospatial data acquired from ADEQ
33 (2020).

34 **Impaired waters** were identified using geospatial data acquired from ADEQ (2018a). Both
35 impaired waters placed on the CWA Section 303(d) list and impaired waters designated as Not
36 Attaining were analyzed. ADEQ considers proposed projects affecting waters within 1.0 mile
37 upstream or 0.5 mile downstream of an impaired water to have the potential to contribute to the
38 impairment; ADEQ reviews such proposed projects to assess compliance with Section 401 of
39 the CWA (ADEQ 2017d). Therefore, this analysis considers impaired waters located within
40 0.5 mile upstream and 1.0 mile downstream of each Build Corridor Alternative.



1 **Waters of the US** were identified using surface waters included in the National Hydrography
2 Dataset (US Geological Survey [USGS] 2019) as a proxy. The National Hydrography Dataset
3 geospatial data were created at a desktop level and may over- or under-represent surface
4 waters present on the ground. Further, not all surface waters are regulatory waters of the US.
5 Although USACE regulates impacts on waters of the US in terms of area as opposed to length,
6 this analysis utilizes mileage because geospatial data depicting acreage are not available.
7 Surface flow regimes described herein are based on the best available data and do not
8 necessarily reflect actual conditions. Site-specific jurisdictional delineations would be required to
9 accurately identify regulated waters and would be conducted during the Tier 2 NEPA process.
10 For this reason, mapped surface waters are referred to as “potential waters of the US.”

11 **Wetlands** were identified using wetlands identified by the National Wetlands Inventory (NWI)
12 (USFWS 2019) as a proxy. NWI geospatial data were created from remote data sources and
13 may not be representative of ground conditions. Formal wetland delineations using the three-
14 part USACE methodology of identifying hydric soils, wetland hydrology, and hydrophytic
15 vegetation would be required to accurately identify wetlands (USACE 2008a). Formal wetland
16 delineations will be conducted during Tier 2 NEPA analysis, if needed. Additionally, the NWI
17 identifies most surface waters within Arizona as “riverine” wetlands; however, this classification
18 is known to be highly inaccurate as most surface waters in the state are not wetlands. As a
19 result, areas identified as “riverine” wetlands are excluded from this analysis.

20 To further refine the wetlands analysis, site-specific reviews were conducted at key areas
21 (e.g., at major river crossings) that had potential to affect the outcome of the analysis.
22 Predominant vegetation observed during site visits was used to identify potential wetlands.
23 Several key areas could not be assessed in the field due to accessibility issues. For these
24 locations, the USGS (2004) National Gap Analysis Program report Provisional Digital Land
25 Cover Map for the Southwestern US was used to identify plant species likely to be present.
26 Sites dominated by plant species classified as wetland indicator species were considered to
27 contain potential wetlands (US Department of Agriculture [USDA] 2020). In formal wetland
28 delineations, vegetation is considered to be hydric (i.e., wetland vegetation) if it is dominated by
29 wetland indicator species (USACE 2008a). Locations where site-specific reviews identified
30 potential wetlands are hereinafter referred to as key potential wetlands.

31 **Floodplains** were identified using Flood Insurance Rate Maps provided by FEMA (2017). For
32 the purposes of this analysis, floodplains are defined as Special Flood Hazard Areas regulated
33 by FEMA under the National Flood Insurance Rate Program. Special Flood Hazard Areas are
34 those areas that are susceptible to being inundated by a flood event having a 1 percent chance
35 (base flood or 100-year flood) of being equaled or exceeded each year (FEMA 2007). Areas
36 protected by levees as identified on the Flood Insurance Rate Maps (FEMA 2017) are assessed
37 qualitatively. Regulatory floodways are also identified. Regulatory floodways are defined as the
38 channel of a watercourse and the adjacent land that must be reserved in order to discharge the
39 base flood without cumulatively increasing the water surface elevation more than a designated
40 height (between 0 and 1 foot) (FEMA 2007). Refer to **Appendix E13** (Water Resources
41 Technical Memorandum) for additional information regarding flood zone definitions. The data
42 collection and analysis for this technical report are consistent with EO 13690. FEMA has not
43 mapped all floodplains or areas protected by levees. Further assessment of unmapped
44 floodplains and levees including coordination with flood control districts and jurisdictions would
45 occur during Tier 2 NEPA analyses.



1 The environmental consequences of the No Build and Build Corridor Alternatives were
2 assessed. Because the location and design of the highway have not yet been identified within
3 the larger 2,000-foot-wide corridor and limitations of geospatial data described above, this
4 assessment considers both quantitative and qualitative factors. Quantitative factors consist of
5 measurable quantities of water resources within the 2,000-foot-wide corridors; in most cases the
6 full quantity of resources reported herein would not be directly impacted during project
7 construction. Qualitative factors address considerations that cannot be easily measured. Key
8 factors include:

- 9 • Mapped quantity of water resources within each Build Corridor Alternative (e.g., number of
10 groundwater wells, miles of streams, acreage of wetlands and floodplains, and miles of
11 impaired waterbodies).
- 12 • Configuration of water resources within each Build Corridor Alternative, which may indicate
13 the feasibility of avoiding or minimizing impacts.
- 14 • Proportion of the Build Corridor Alternative that is co-located in an existing transportation
15 right-of-way. Co-located portions of the Build Corridor Alternatives are anticipated to require
16 fewer new lane miles than new corridors.

17 Effects to waters of the US were assessed in the framework of the Section 404(b)(1) guidelines.
18 Characteristics addressed include effects to substrate, suspended particulates/turbidity, water,
19 current patterns and water circulation, normal water fluctuations, and salinity gradients. A
20 discussion of effects to threatened and endangered species, aquatic organisms, and other
21 wildlife is included in **Section 3.14** (Biological Resources). The waters of the US analysis gives
22 special consideration to major watercourses such as the Santa Cruz, Gila, and Hassayampa
23 Rivers. Special consideration is warranted because portions of these features contain wetlands,
24 riparian vegetation, and perennial or intermittent flows, features that are relatively uncommon
25 within the Study Area. Further, because major watercourses are more likely to contain perennial
26 or intermittent flows than small, unnamed watercourses, they are more likely to be subject to
27 regulation under the CWA.

28 After assessing the above quantitative and qualitative factors, the level of impact on each
29 category of water resource was ranked relative to the other alternatives. Potential strategies to
30 avoid, minimize, and mitigate impacts are then presented, followed by a discussion of analyses,
31 assessments, and coordination that would be conducted during Tier 2 NEPA analyses.

32 **3.13.3 Affected Environment**

33 The following sections summarize the water resources within the Study Area. Where applicable,
34 information is presented by geographic region: South Section, Central Section, and North
35 Section. Detailed descriptions and quantifications of water resources within each option, which
36 comprise the Build Corridor Alternatives, are presented in **Appendix E13** (Water Resources
37 Technical Memorandum).

38 The Study Area falls within the extensive Basin and Range Physiographic Province of southern
39 and western Arizona. This province is characterized by elongated, northwest to southeast
40 trending mountain ranges separated by broad alluvial valleys (Nations and Stump 1996).
41 Average annual precipitation within the Study Area ranges from 8.3 inches at Phoenix Sky



1 Harbor Airport to 18.7 inches in Nogales. Precipitation peaks seasonally as a result of jet-stream
2 guided winter storm systems and summer monsoons (ADWR 2010).

3 Groundwater is water found in pore spaces between grains of soil or rock or within fractured
4 rock formations. Groundwater can originate from precipitation that infiltrates through soil and
5 underlying unsaturated geologic materials until reaching the water table. The primary sources of
6 groundwater within the Study Area are infiltration of surface flows from mountain ranges along
7 the valley margins, streamflow infiltration, and underflow from adjacent basins (ADWR 2010).
8 Groundwater is a major source of potable and irrigation water in the Study Area.

9 Surface water resources within the Study Area are associated with three major watersheds: the
10 Santa Cruz River, the Middle Gila River, and the Agua Fria River-Lower Gila River watersheds
11 (ADWR 2010). Major watercourses within these watersheds generally contain perennial or
12 intermittent flows, while streamflow in other surface drainages is primarily ephemeral. Within the
13 Study Area, numerous ephemeral desert washes carry stormwater flows and can create
14 intricate, braided drainage systems across the valleys between mountain ranges. In addition to
15 stormwater inputs, groundwater, effluent, and irrigation return waters contribute to surface flows
16 in the intermittent and perennial drainages. Surface water is also a source of potable and
17 irrigation water within the Study Area. Surface waters are diverted from waterways and
18 impoundments, then transported to intake facilities or agricultural fields via a vast network of
19 canals. No major surface water impoundments or surface waters with a domestic water source
20 designated use occur within the Project Area.

21 3.13.3.1 Active Management Areas

22 The Study Area encompasses portions of four active management areas that cover
23 approximately 14,700 square miles and stretch continuously from the international border with
24 Mexico at Nogales through central Arizona to the northern boundary of Maricopa County. Active
25 management areas are shown on **Figure 3.13-1**, **Figure 3.13-2**, and **Figure 3.13-3**. All corridor
26 options except Options K, Q1, X, U, and S occur entirely within active management areas.

27 The Phoenix, Pinal, and Tucson Active Management Areas contain deep alluvial aquifers and
28 substantial volumes of water in storage. However, aquifer recharge rates are low and pumping
29 is high. As a result, the aquifers have historically been in an overdraft condition. In the Santa
30 Cruz Active Management Area, aquifers occur in basin-fill sediments along the Santa Cruz
31 River. Water levels in the stream alluvium along the Santa Cruz River are closely interrelated
32 with precipitation and drought events. The Santa Cruz Active Management Area is considered
33 to be in a safe-yield condition, which is accomplished when no more groundwater is being
34 withdrawn than is being replaced annually (ADWR 2010).

35 Each active management area has a management goal to guide the use of groundwater within
36 its boundaries. The management goals for the active management areas in the Study Area are
37 as follows:

38 • **Santa Cruz Active Management Area.** Maintain a safe-yield condition and prevent long-
39 term declines of local water tables.

40 • **Tucson Active Management Area.** Establish a safe-yield condition by 2025.

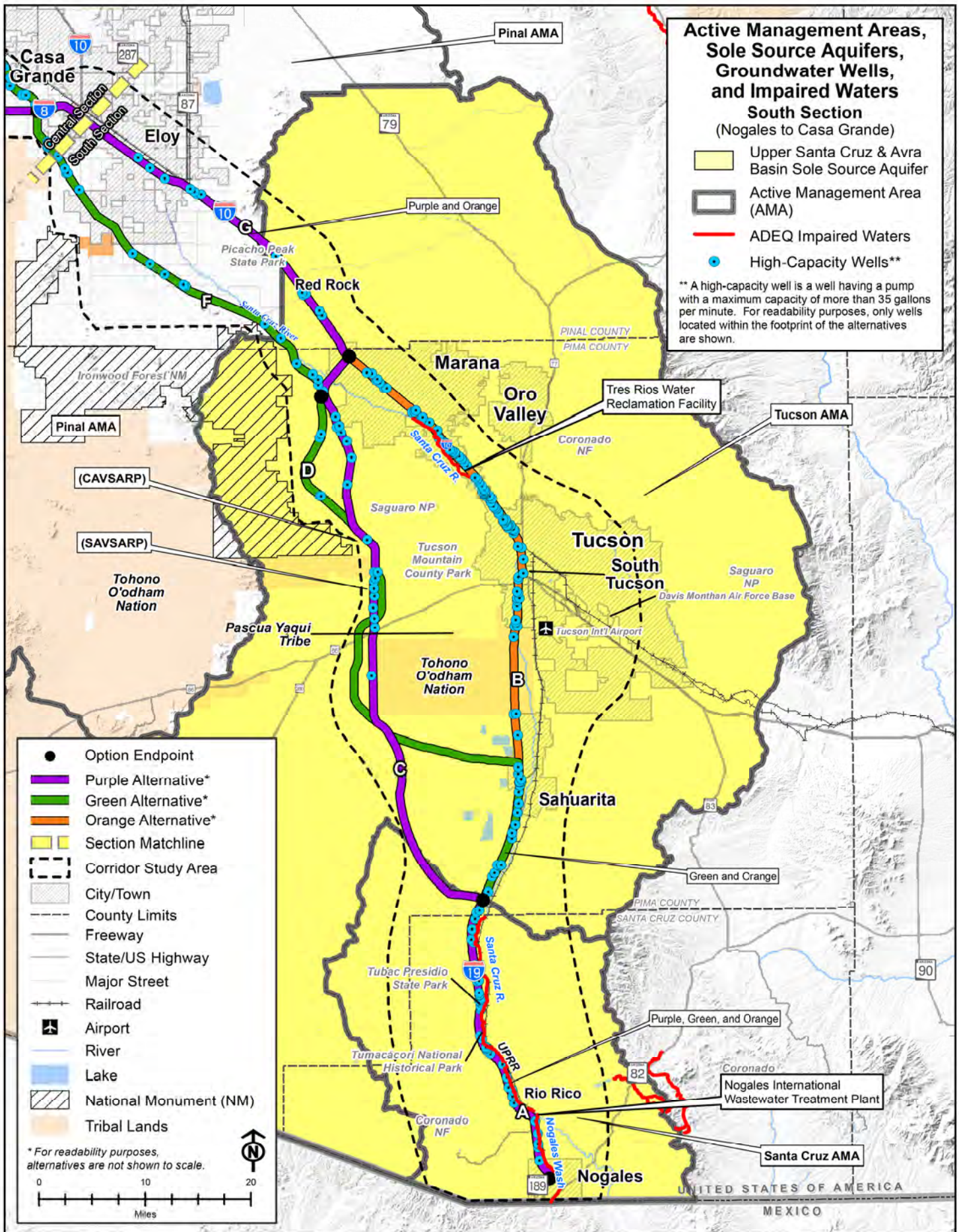


Figure 3.13-1. South Section Active Management Areas, Sole Source Aquifers, Groundwater Wells, and Impaired Waters

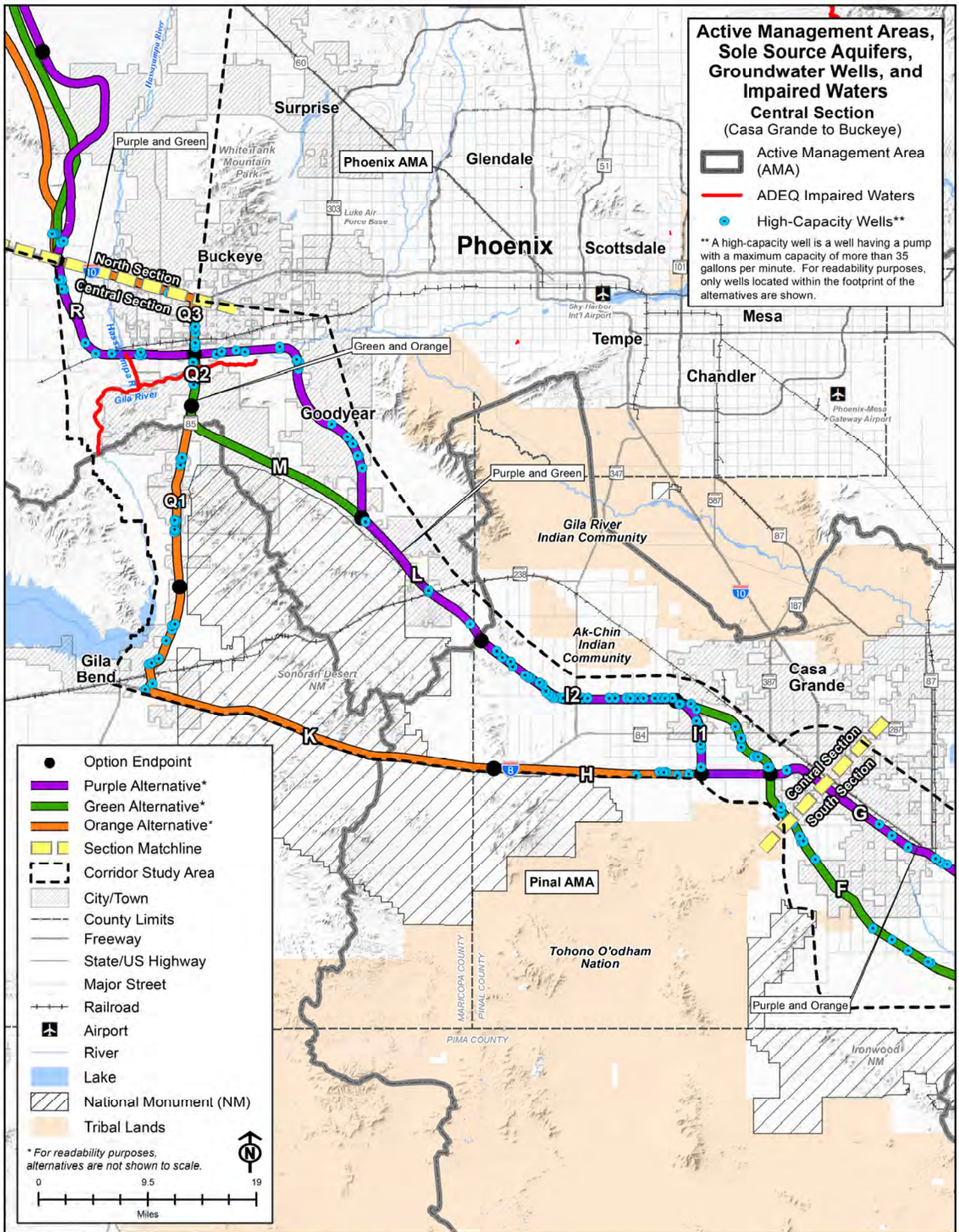


Figure 3.13-2. Central Section Active Management Areas, Sole Source Aquifers, Groundwater Wells, and Impaired Waters

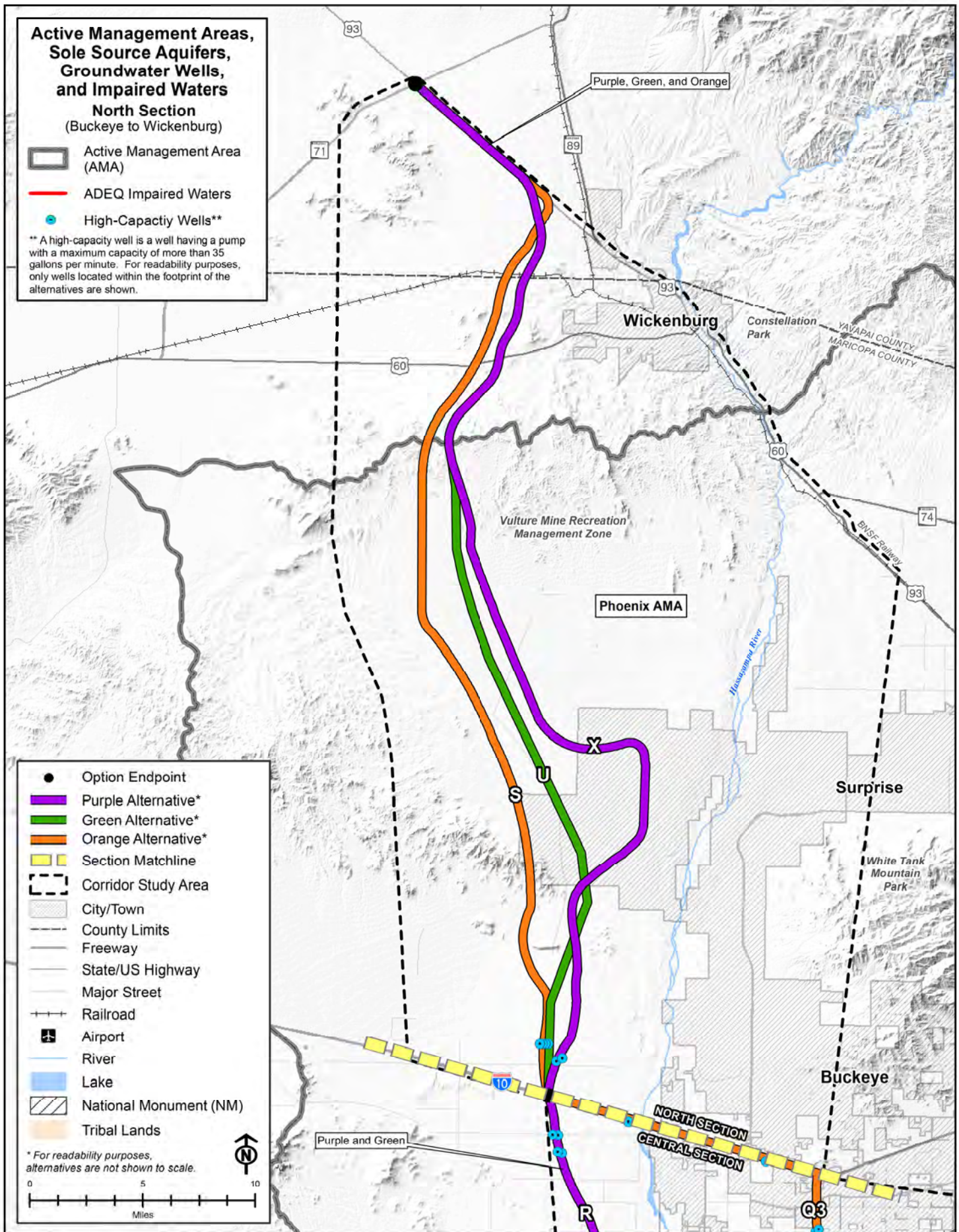


Figure 3.13-3 North Section Active Management Areas, Sole Source Aquifers, Groundwater Wells, and Impaired Waters



1 • **Pinal Active Management Area.** Allow development of non-irrigation uses and preserve
2 existing agricultural economies for as long as feasible, consistent with the necessity to
3 preserve future water supplies for non-irrigation uses.

4 • **Phoenix Active Management Area.** Achieve a safe-yield condition by year 2025 through
5 increased use of renewable water supplies and decreased groundwater withdrawals in
6 conjunction with efficient water use.

7 Recharge of aquifers in the Tucson Active Management Area is supported by the CAVSARP
8 and the SAVSARP. Colorado River water is delivered to Tucson via the CAP canal, and that
9 water is allowed to sink into the ground and recharge the aquifer at CAVSARP and SAVSARP
10 (City of Tucson 2017). The surface ponds for these recharge facilities are west of Tucson in
11 Avra Valley (**Figure E13-2**). Recharge basins associated with the CAVSARP are located
12 approximately 1,000 feet west of Options C and D. One of the SAVSARP's nine recharge
13 basins, Basin 1, is located within Option C; the remaining basins are located immediately
14 adjacent to Option C on the west side of Sandario Road. Several wells owned by the City of
15 Tucson adjacent to the CAVSARP and SAVSARP properties are located within Options C and
16 D. Such wells include piezometers, which are used to measure groundwater depth or pressure.

17 **3.13.3.2 Sole Source Aquifers**

18 The Upper Santa Cruz and Avra Valley sole source aquifer underlies approximately 4,591
19 square miles in southern Arizona and is the only USEPA-designated sole source aquifer within
20 the Study Area (USEPA 2017a). The full lengths of Options A-D and portions of Options F and
21 G are located within this sole source aquifer. The Upper Santa Cruz and Avra Valley sole
22 source aquifer is shown on **Figure 3.13-1**.

23 **3.13.3.3 Groundwater Wells**

24 Water quality data from Pima County drinking water providers for the sampling years from 1998
25 to 2000 indicate that the most common regulated constituents detected were nitrate, fluoride,
26 arsenic, and chromium; none exceeded established drinking water maximum contaminant levels
27 (PAG 2002).

28 Groundwater in the Pinal Active Management Area is slightly alkaline, fresh, and hard to very
29 hard, as indicated by pH values and total dissolved solids. Of 86 sites sampled within the Pinal
30 Active Management Area in 2005-2006, 13 percent met all Safe Drinking Water Act primary and
31 secondary water quality standards. Primary Safe Drinking Water Act and ADWR aquifer water
32 quality standards were exceeded at 70 percent of the 86 sites sampled. Sites sampled within
33 the Pinal Active Management Area exceeded Safe Drinking Water Act primary standards for the
34 level of arsenic, fluoride, gross alpha, nitrate, and uranium (ADEQ 2008).

35 Groundwater in the Phoenix Active Management Area is generally suitable for drinking water
36 uses. Although groundwater quality in the Phoenix Active Management Area is generally
37 suitable for most uses, 68 groundwater contamination sites have been identified. Volatile
38 organic compounds are the most common contaminant at these sites. Approximately
39 1,500 assessed sites have been found to exceed drinking water standards, most commonly due
40 to nitrate, fluoride, arsenic, manganese, and organics (ADWR 2010).



1 Portions of the Study Area north of the Phoenix Active Management Area occur within the
2 Upper Hassayampa River Basin. Groundwater in this basin is generally suitable for drinking
3 water uses. Of 34 sites sampled, 9 sites within the Upper Hassayampa River Basin have
4 exceeded the primary maximum contaminant levels for arsenic, gross alpha, and nitrate (ADEQ
5 2013a). Groundwater in the basin typically has calcium or mixed-bicarbonate chemistry and is
6 slightly alkaline, fresh, and hard to very hard, based on pH levels, concentrations of total
7 dissolved solids, and hardness concentrations (ADEQ 2013a).

8 Groundwater is a major source of potable and irrigation water in the Study Area. Numerous
9 private, municipal, utility, and corporate-owned groundwater wells are located within the Study
10 Area. High-capacity public and private water supply and monitoring wells within the Build
11 Corridor Alternatives are shown on **Figure 3.13-1**, **Figure 3.13-2**, and **Figure 3.13-3**. A high-
12 capacity well is a well having a pump with a maximum capacity of more than 35 gallons per
13 minute (ADWR 2017).

14 **3.13.3.4 Outstanding Arizona Waters**

15 No Outstanding Arizona Waters are located within the Study Area (ADEQ 2020); therefore, this
16 resource is not carried forward for further analysis.

17 **3.13.3.5 Impaired Waters**

18 Locations of impaired waters are shown on **Figure 3.13-1**, **Figure 3.13-2**, and **Figure 3.13-3**.
19 Impaired surface water segments within 0.5 mile upstream or 1.0 mile downstream of Build
20 Corridor Alternatives include the following:

- 21 • Santa Cruz River, Options A and B, Impairment: ammonia and Escherichia coli [E. coli]
- 22 • Potrero Creek, Option A, Impairment: chlorine, E. coli, and dissolved oxygen
- 23 • Nogales Wash, Option A, Impairment: ammonia, dissolved copper, E. coli, and total residual
24 chlorine
- 25 • Hassayampa River, Option R, Impairment: E. coli and selenium
- 26 • Gila River, Options N and Q2, Impairment: selenium and boron

27 **3.13.3.6 Waters of the US**

28 Major drainages in the Study Area, which are all potential waters of the US, include the Santa
29 Cruz River, Gila River, and Hassayampa River. These and other named watercourses are
30 shown on **Figure 3.13-4**, **Figure 3.13-5**, and **Figure 3.13-6**.

31

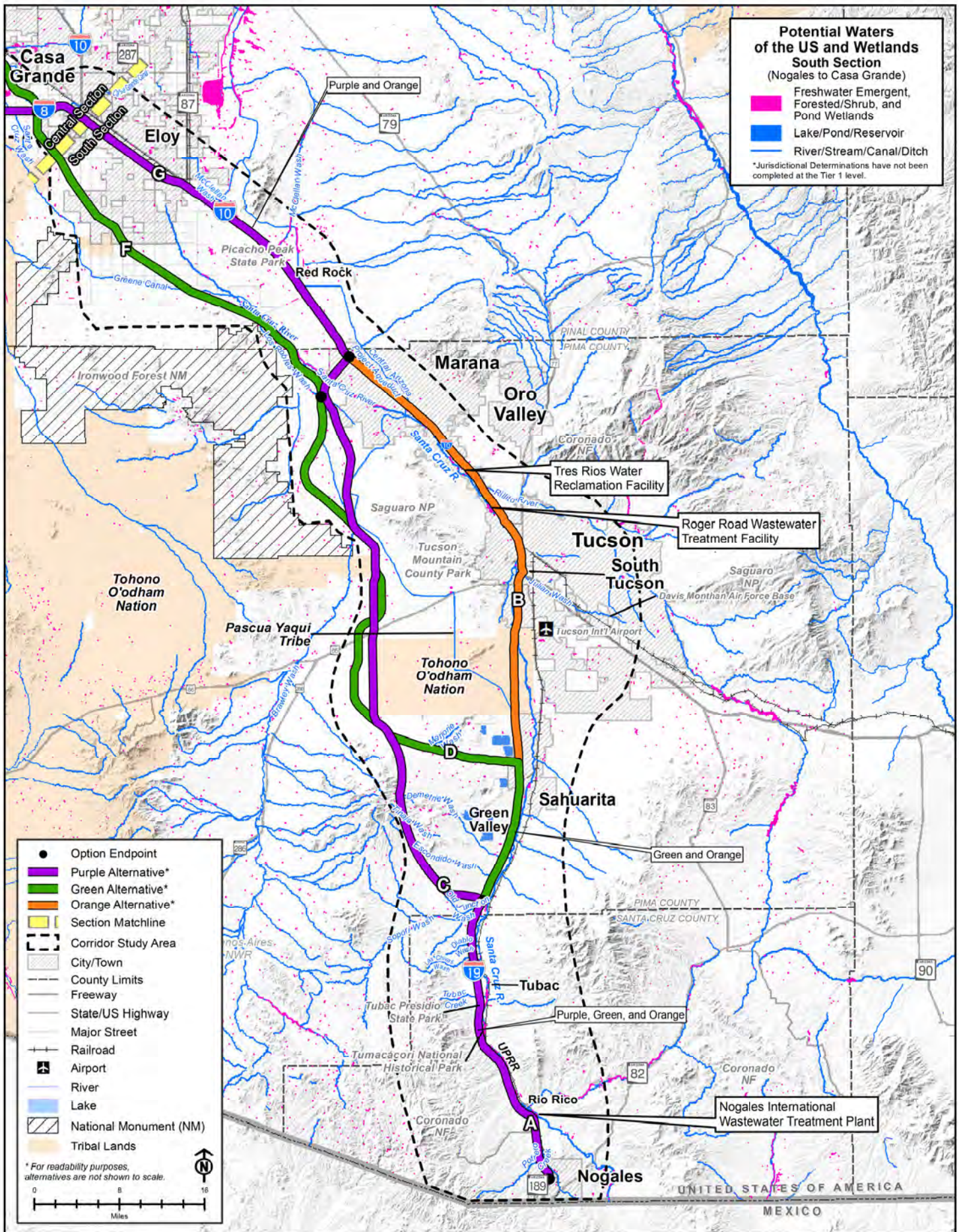


Figure 3.13-4. South Section Potential Waters of the US and Wetlands

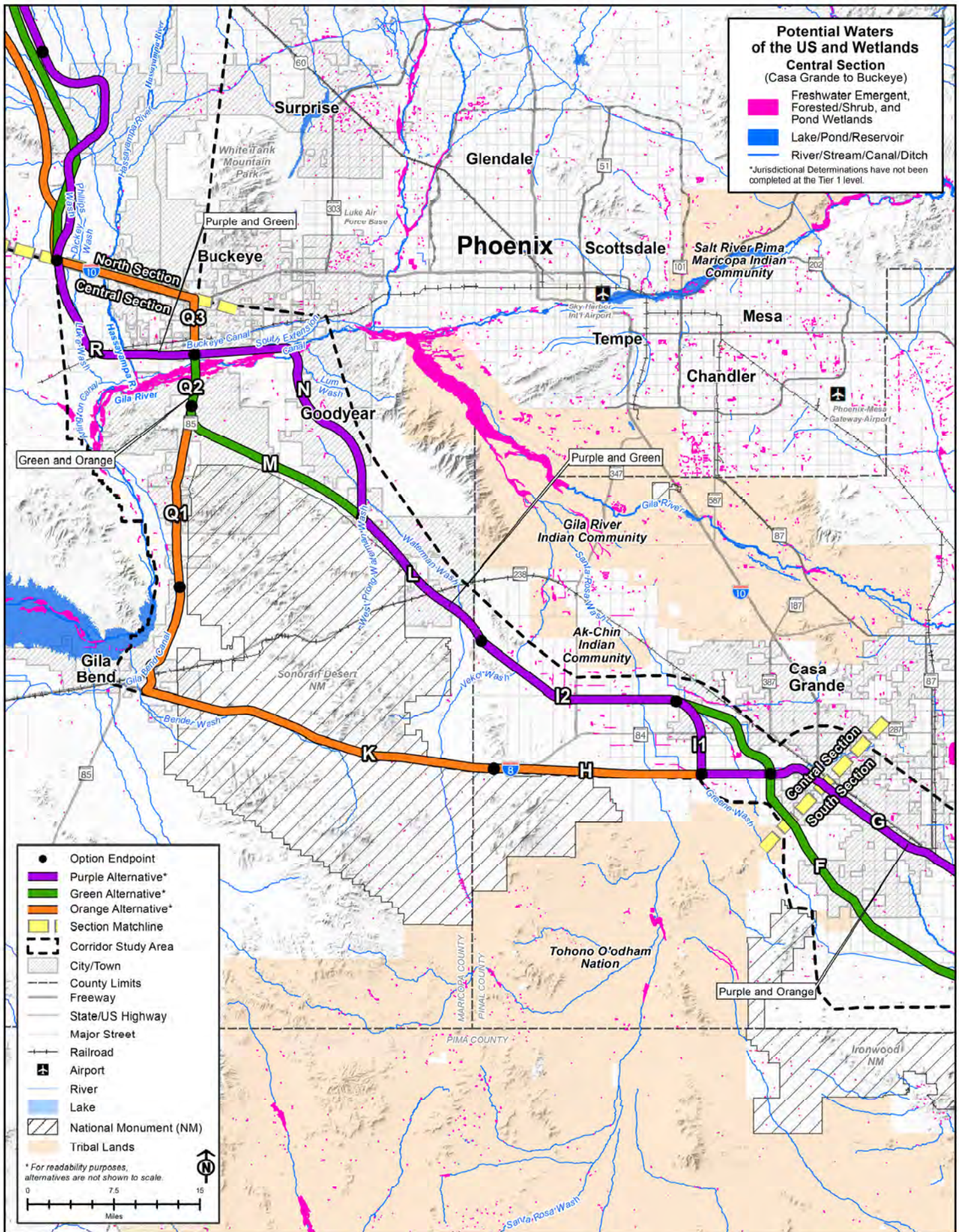


Figure 3.13-5. Central Section Potential Waters of the US and Wetlands

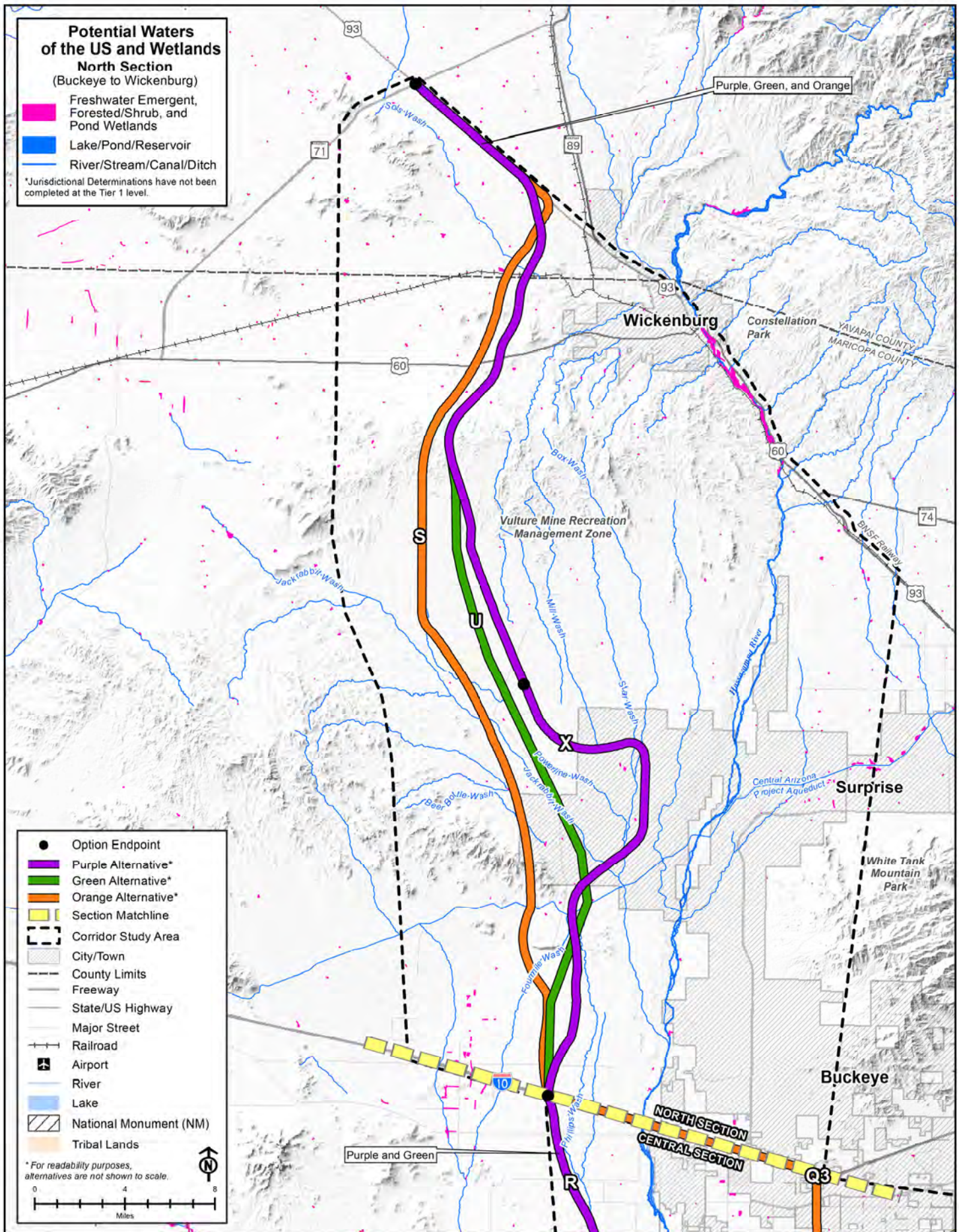


Figure 3.13-6. North Section Potential Waters of the US and Wetlands



1 The Santa Cruz River flows north from the border with Mexico and disperses in the vicinity of
2 Eloy. Only two reaches of the river experience year-round streamflow due to treated wastewater
3 effluent discharged downstream of Nogales and Tucson (ADEQ 2016; Nakolan, Meixner, and
4 Thompson 2015). Other portions of the Santa Cruz River flow intermittently (ADWR 2008) as
5 groundwater pumping has eliminated most natural perennial flow (ADEQ 2016). USACE has
6 determined that two reaches of the Santa Cruz River, from the Tubac gage to the Continental
7 gage near Green Valley and from the Roger Road Wastewater Treatment Plant to the Pima
8 County/Pinal County border, located within or adjacent to the Project Area are Traditional
9 Navigable Waters (USACE 2008b). A portion of the Nogales International Wastewater
10 Treatment Plant is located within Option A north of Nogales and a portion of the Tres Rios
11 Water Reclamation Facility is located within Option B in Marana. Both facilities discharge
12 treated effluent to the Santa Cruz River, which is located 0.3 mile and 0.5 mile from Options A
13 and B in the vicinity of these facilities, respectively.

14 Within the Study Area, the Gila River flows east to west and contains perennial flows largely due
15 to effluent from wastewater treatment plants and irrigation return (ADWR 2010). A 6.9-mile
16 reach of the Gila River, from Powers Butte to Gillespie Dam, is designated as a Traditional
17 Navigable Water (USACE 2008b). This reach begins approximately 3 miles south of Option R
18 but does not cross the Project Area.

19 The Hassayampa River is ephemeral within the Project Area but is intermittent throughout much
20 of the Study Area (ADWR 2009). Perennial flows occur within the Study Area south of
21 Wickenburg and beyond the Study Area in the river's upper reaches (ADWR 2009). The
22 Hassayampa River flows south through the North Section of the Study Area to its confluence
23 with the Gila River in the Central Section.

24 Several major canals and other named watercourses, including the CAP canal, Brawley Wash,
25 Potrero Creek, and Vekol Wash, are located within the Project Area. Additionally, the Project
26 Area includes ponds used for livestock water, groundwater recharge, aesthetics, and other
27 purposes.

28 **3.13.3.7 Wetlands**

29 Potential wetland resources present in the Study Area are associated with channels and
30 floodplains of the major drainages, canals, and ponding areas in or adjacent to ephemeral
31 washes. Notable potential wetlands within the Project Area, as identified using geospatial data
32 (USFWS 2019), are located along Potrero Creek in Option A, approximately 2 miles of the
33 Santa Cruz River near Rio Rico within Option A, approximately 3 miles of the Santa Cruz River
34 near Red Rock within Option F, and the Gila River near Buckeye within Option Q2.

35 Potential wetlands identified during site-specific reviews consist of the following:

- 36 • Santa Cruz River south of Tucson, Option B
- 37 • Santa Cruz River in Tucson, Option B
- 38 • Rillito River in Tucson and Marana, Option B
- 39 • Santa Cruz River in western Marana, Option C



- 1 • Braided channels associated with the Santa Cruz River, Los Robles Wash, and unnamed
2 drainages near the Pima-Pinal County Line, Option F
- 3 • Vekol Wash, an unnamed drainage, and unnamed canal southeast of Goodyear, Option I2
- 4 • Gila River in Goodyear, Option N
- 5 • Gila River, Arlington Canal, and an unnamed canal at SR 85 in Buckeye, Option Q2
- 6 • Hassayampa River and an unnamed canal near Buckeye, Option R
- 7 NWI-mapped freshwater emergent, forested/shrub, and pond wetlands are shown on **Figure**
8 **3.13-4**, **Figure 3.13-5**, and **Figure 3.13-6**.

9 **3.13.3.8 Floodplains**

10 Areas mapped by FEMA as floodplains are shown on **Figure 3.13-7**, **Figure 3.13-8**, and **Figure**
11 **3.13-9**. Floodplains are associated with the Santa Cruz River, Gila River, Hassayampa River,
12 and their tributaries. Within the town of Marana, approximately 2,750 acres are protected by a
13 levee located along the Santa Cruz River (FEMA 2017). Approximately 0.3 mile of the
14 southeastern end of this levee is located within Option B. Another 86 acres are protected by a
15 levee along the Santa Cruz River in Tucson (FEMA 2017). Approximately 1 mile of this levee is
16 located within Option B. Regulatory floodways are found along the Santa Cruz River, Gila River,
17 Hassayampa River, and their major tributaries.

18 **3.13.4 Environmental Consequences**

19 This section includes an analysis and comparison of the No Build and Build Corridor
20 Alternatives. Both quantitative and qualitative factors are considered as described in **Section**
21 **3.13.2**. The No Build Alternative is presented, followed by a discussion of impacts common to all
22 the Build Corridor Alternatives. Purple, Green, and Orange Alternatives are then compared. The
23 Recommended Alternative is then discussed and compared with the Purple, Green, and Orange
24 Alternatives. This is followed by a discussion of the Preferred Alternative, which is compared to
25 the Recommended Alternative. The two Preferred Alternative options (west option in Pima
26 County and east option in Pima County) are also compared to one another.

27 **3.13.4.1 No Build Alternative**

28 The No Build Alternative represents the existing transportation system, along with committed
29 improvement projects that would be completed in the future. Under the No Build Alternative,
30 traffic would continue to use the existing transportation system and a new I-11 corridor would
31 not be constructed. As such, the No Build Alternative represents the baseline for comparison to
32 the Build Corridor Alternatives and would generally result in the fewest negative effects to water
33 resources. However, future capacity improvement projects completed under the No Build
34 Alternative may still result in substantive impacts on water resources. The general nature of
35 impacts from future capacity improvement projects is described in **Section 3.13.4.2**.
36 Construction of Build Corridor Alternatives that utilize existing roadways may present an
37 opportunity to address known drainage issues; this opportunity may not be available under the
38 No Build Alternative.

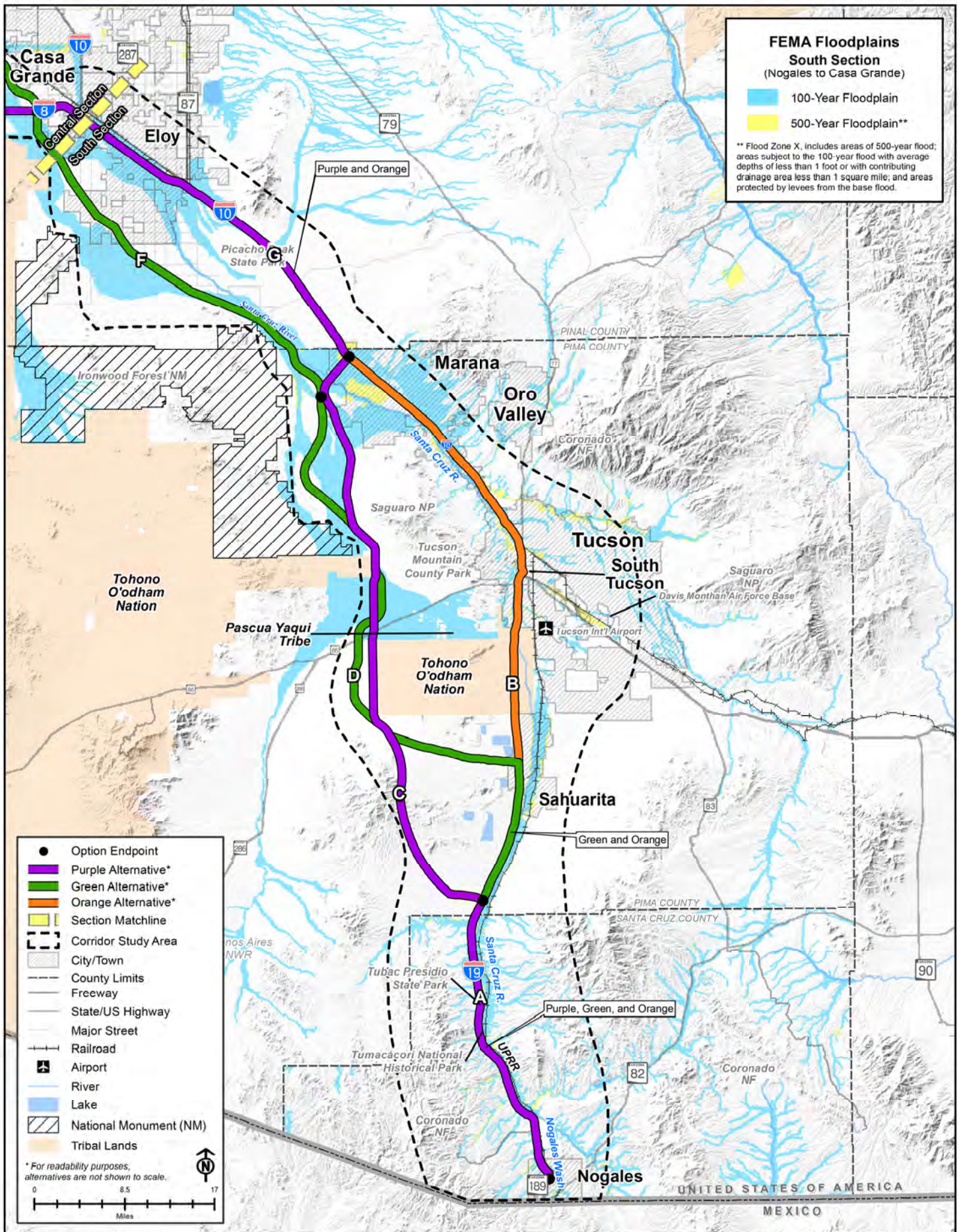


Figure 3.13-7. South Section FEMA Floodplains

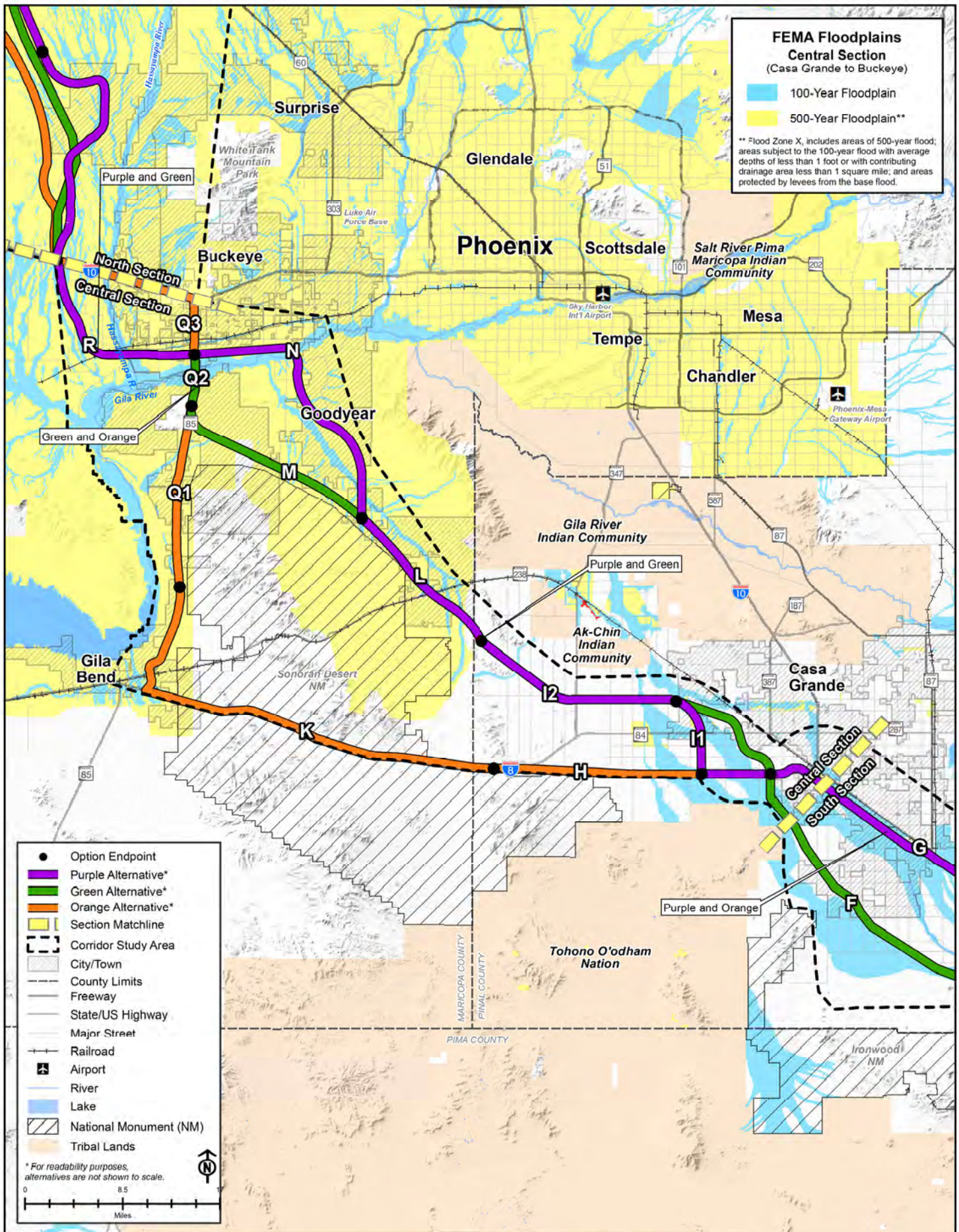


Figure 3.13-8. Central Section FEMA Floodplains

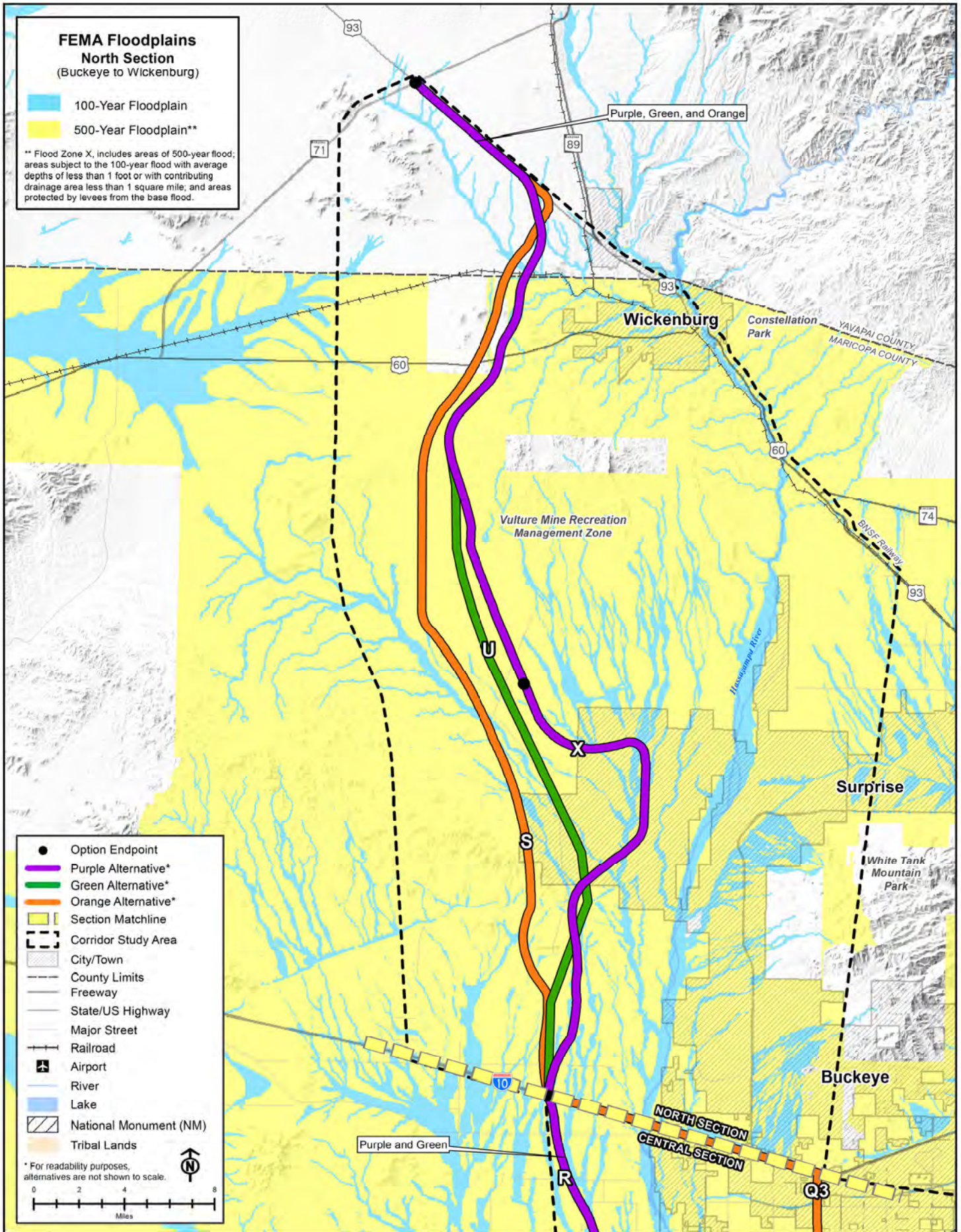


Figure 3.13-9. North Section FEMA Floodplains



1 **3.13.4.2 Impacts Common to All Build Corridor Alternatives**

2 Impacts common to all Build Corridor Alternatives are described below. The degree to which
3 such impacts would occur varies by alternative and is described in **Section 3.13.4.3**. Many of
4 the described impacts are interrelated. For example, construction-related reductions in the
5 length of potential waters of the US may reduce infiltration of surface water, which may reduce
6 groundwater quantity. Reductions in groundwater quantity could in turn reduce the length of
7 perennial reaches of surface waters, some of which are groundwater dependent. Construction
8 of any Build Corridor Alternative would impact water resources by reducing the quantity and
9 quality of groundwater and surface water as described below.

10 **Groundwater quantity:** As described in **Section 3.13.3**, groundwater within the Study Area can
11 originate from infiltration of precipitation and surface flows, among others. As a result, activities
12 that affect surface water infiltration may also affect groundwater.

13 Surface water infiltration could be impacted by activities that reduce the surface area or
14 timeframe available for infiltration to occur. All Build Corridor Alternatives would increase the
15 amount of impervious surface within the Study Area, thereby directly reducing the area available
16 for infiltration. Increases of impervious surface would also increase stormwater runoff, which
17 may result in greater downstream flow velocities. Increased flow velocity would provide surface
18 waters less opportunity for infiltration as flows would exit a given area more rapidly.
19 Construction activities that increase erosion, that constrict flows, or that reduce the total length
20 of drainages may also increase downstream flow velocities. Such activities include vegetation
21 removal, soil excavation, and construction or extensions of bridges and culverts as well as those
22 that require diversions or filling of surface waters. In some cases, increased erosion could result
23 in sedimentation of downstream waters, which could reduce downstream flow velocities, thereby
24 increasing infiltration.

25 **Groundwater quality:** Construction of I-11 may impact groundwater quality through infiltration
26 of pollutants into aquifers. Surface waters carrying increased pollutant loads as described below
27 may introduce pollutants to groundwater in this way. Hazardous materials could also infiltrate
28 directly into groundwater as a result of accidental releases.

29 **Surface water quantity:** Surface water quantity would be affected by activities that fill existing
30 surface waters such as washes, rivers, or stock tanks. New drainage systems, including
31 retention basins, may be constructed along new roadway corridors or may be altered along
32 existing corridors. As described in **Section 3.13.3**, groundwater contributes to surface flows in
33 intermittent and perennial drainages within the Study Area. Thus, surface water quantity may be
34 altered by activities that reduce or increase groundwater quantity.

35 Increases of impervious surface would also increase stormwater runoff, which may result in
36 greater downstream flow velocities within surface waters. Increased flow velocity would reduce
37 the timeframe surface waters are present as flows would exit a given area more rapidly.
38 Construction activities that increase erosion, that constrict flows, or that reduce the total length
39 of drainages may also increase downstream flow velocities. Such activities include vegetation
40 removal, soil excavation, and construction or extensions of bridges and culverts as well as those
41 that require diversions or filling of surface waters. In some cases, increased erosion could result
42 in sedimentation of downstream waters, which could reduce downstream flow velocities and
43 increase surface water presence.



1 **Surface water quality:** Constructing I-11 would result in an increase in the overall area of
2 impervious surface area within the associated watershed, which would result in increases in
3 localized runoff compared to existing conditions. Generally, runoff contains sediment or
4 pollutants in quantities that could reduce water quality. For example, runoff from paved surfaces
5 would carry particulate matter from tire wear, oils, and greases from vehicles, and would be
6 expected to include urban litter such as paper and plastic materials. Any alternative that
7 increases traffic volumes would increase the contribution of this automotive-based nonpoint
8 source contamination. Hazardous materials may also enter surface waters as a result of
9 accidental releases. These materials could be directly released into watercourses at drainage
10 crossings or could be conveyed into surface waters via stormwater runoff.

11 **Active Management Areas and Sole Source Aquifers**

12 All Build Corridors Alternatives are at least partially located within active management areas and
13 the Upper Santa Cruz and Avra Valley Sole Source Aquifer. As a result, all Build Corridor
14 Alternatives could affect these groundwater resources. Potential effects to active management
15 areas are primarily related to groundwater quantity, as described above, as the primary goal of
16 all active management areas within the Study Area is to maintain or attain a safe-yield condition.
17 Effects to sole source aquifers are related to groundwater quality, as described above.

18 **Groundwater Wells**

19 Effects to groundwater wells could result from any Build Corridor Alternative due to the potential
20 impacts on groundwater quantity and quality described above. Reductions in groundwater
21 quantity may reduce a well's capacity. The potential for an alternative to affect or contaminate
22 groundwater supply wells depends on well construction, proximity to pollution sources, and
23 geological conditions. Effects on wells may also include physical damage to the well casing or
24 wellhead, restriction in access to the wellhead, restricted use of the well, and/or administrative
25 barriers to the well or use of the well, and safety issues associated with access to or use of the
26 well.

27 **Impaired Waters**

28 All Build Corridor Alternatives would parallel or cross the same impaired segments of the Santa
29 Cruz River, Potrero Creek, and Nogales Wash within Option A. All Build Corridor Alternatives
30 would cross or parallel additional impaired waters in other portions of their corridor as described
31 in **Appendix E13** (Water Resources Technical Memorandum), **Section E13.5.3**.

32 Impairments for surface waters in proximity to Build Corridor Alternatives include chlorine,
33 copper, boron, selenium, ammonia, low dissolved oxygen, and E. coli. Impairments within the
34 Study Area are primarily related to mining, agricultural runoff, grazing, contributions from urban
35 areas including inputs from fertilizers and leaking septic systems, recreational users, wildlife,
36 stormwater, municipal and industrial discharges, and inputs from Mexico, with transportation a
37 minor contributor (ADEQ 2016).

38 Temporary increases in stormwater runoff during construction, or permanent increases resulting
39 from new or widened corridors, could affect impaired waters. For example, if soils are high in
40 selenium, erosion of soils during or after construction could increase selenium loading in the
41 adjacent streams. Nutrients in soils (nitrogen or phosphorous) or use of ammonia-based
42 fertilizers may affect waters listed for ammonia or low dissolved oxygen. At rest stations, E. coli



1 from poorly maintained septic systems, or more commonly from dog waste, can be high. New
2 rest stations or increased use of existing rest stations may exacerbate nearby impairments.

3 Waters of the US and Wetlands

4 Potential waters of the US and wetlands would be affected by all Build Corridor Alternatives due
5 to effects to surface water quantity, as described above. Permanent impacts could occur as a
6 result of construction of cut and fill slopes, structural fills including bridge piers and culverts,
7 diversions, or other transportation facilities. Short-term, temporary impacts could occur during
8 construction activities such as clearing ground for staging areas, access routes, and diversions
9 of surface flow. Placement of fill material and structures within streams could permanently alter
10 stream contours and result in the loss of wetlands.

11 The Santa Cruz River is a notable potential waters of the US that could be impacted by all the
12 Build Corridor Alternatives. The Nogales International Wastewater Treatment Plant releases
13 effluent into the Santa Cruz River; therefore, impacts on this facility would also affect waters of
14 the US. Both the Santa Cruz River and the Nogales International Wastewater Treatment Plant
15 are located within a section of corridor co-located with I-19 within Option A. Should the corridor
16 be widened to accommodate I-11, the final corridor would most likely be sited to avoid impacting
17 the Nogales International Wastewater Treatment Plant. If widening were to occur on the western
18 side of I-19, many direct impacts on the Santa Cruz River could also be avoided.

19 All the Build Corridor Alternatives may also impact wetlands along Potrero Creek and the Santa
20 Cruz River within Option A. Although this option is co-located with I-19, the potential wetlands
21 are situated such that they may be difficult to avoid should the corridor be widened to
22 accommodate I-11 traffic.

23 Characteristics of waters of the US identified in the CWA Section 404(b)(1) guidelines that may
24 be impacted under any Build Corridor Alternative include substrate, suspended
25 particulates/turbidity, water, current patterns and water circulation, normal water fluctuations,
26 and salinity gradient and are described in detail below.

27 **Substrate:** Construction of any of the Build Corridor Alternatives may alter substrate through
28 the placement of erosion control materials such as riprap or concrete within waters of the US.
29 Substrate may also be altered by over-excavation of native materials, which may not be
30 replaced in-kind, or by placement of structures such as concrete culverts within waters.
31 Sedimentation or scour may alter substrate within and downstream of construction areas.

32 **Suspended particulates/turbidity and salinity gradients:** These characteristics may be
33 affected by activities that increase or decrease stormwater runoff, erosion, or downstream flow
34 velocities. Such activities include vegetation removal, soil excavation, and construction or
35 extensions of bridges and culverts as well as those that require diversions or filling of surface
36 waters.

37 **Water:** Water quantity would be affected by activities that fill existing surface waters such as
38 washes, rivers, or stock tanks. Drainage systems including retention basins may be constructed
39 along new roadway corridors or may be altered along existing corridors. As described in
40 **Section 3.13.3**, groundwater contributes to surface flows in intermittent and perennial
41 drainages. Thus, water quantity may also be impacted by activities that reduce or increase
42 groundwater quantity as described above.



1 **Current patterns and water circulation:** Construction of roadway features within waters of the
2 US may alter water currents and circulation. Such features could include bridge piers and
3 erosion control such as riprap or concrete flooring. Diverting or channelizing existing surface
4 waters may also alter current patterns and circulation.

5 **Normal water fluctuations:** This characteristic may be impacted by activities that alter flow
6 velocities and water quantity.

7 **Floodplains**

8 Floodplains occur within all the Build Corridor Alternatives and could be affected by activities
9 that affect surface water quantity and flow patterns, as described above. Such activities include
10 those that result in an increase in impervious surface, constriction or blockage of surface water
11 flow, and the placement of fill or structure within a waterway or floodplain. Placement of fill or
12 structures within a floodplain could increase base flood elevation or cause new backwaters to
13 form upstream. Downstream impacts could include increased velocities and erosion.

14 **3.13.4.3 Comparison of Purple, Green, and Orange Alternatives**

15 The discussion of relative impacts on water resources in this section is based on quantity of the
16 resource within each alternative, the potential for each alternative to avoid resources during the
17 Tier 2 NEPA design process, and the amount of new versus co-located corridor within each
18 alternative. The Build Corridor Alternative’s ability to avoid resources was determined by
19 assessing the density, size, and position of each resource within the corridor. New corridors are
20 generally expected to have greater overall impacts on resources than co-located corridors
21 because they would result in the greatest amount of new disturbance.

22 **Active Management Areas**

23 **Table 3.13-1** shows the miles of each alternative within active management areas. The Purple
24 and Green Alternatives have comparable lengths within active management areas, while the
25 Orange Alternative has the shortest length within active management areas.

26 **Table 3.13-1. Active Management Areas in the 2,000-foot-wide Build Corridor**
27 **Alternatives**

Active Management Area	Purple Alternative ^a	Green Alternative	Orange Alternative	Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option
Santa Cruz	37.1	28.9	28.9	28.9	28.9	28.9
Tucson	63.8	70.9	72.3	77.4	90.0	69.0
Pinal	57.6	63.1	58.9	63.2	67.9	65.4
Phoenix	93.2	83.0	54.0	88.5	83.2	83.2
Total	251.7	245.9	214.1	258.0	270.0	246.5

28 SOURCE: ADWR 2020.

29 ^a All numbers in table rounded to the nearest 0.1 mile.

30
31



1 Both the Purple Alternative and the Green Alternative are in close proximity to the CAVSARP
2 and SAVSARP and may impact ancillary facilities such as monitoring wells. The Purple
3 Alternative is situated such that impacts on Basin 1 of the SAVSARP would be nearly
4 unavoidable, given the basin’s 1,000 foot width. Loss of SAVSARP Basin 1 would negatively
5 impact the aquifer recharge program and may interfere with the Tucson Active Management
6 Area’s ability to meet or maintain its goal of safe-yield.

7 Overall, impacts on active management areas are expected to be the lowest for the Orange
8 Alternative and highest for the Purple Alternative. The Purple Alternative would have the
9 greatest impact due to its potential to impact the SAVSARP. Otherwise, the Green Alternative
10 would be expected to have the greatest effect to active management areas because it has the
11 greatest length of new corridor. The Orange Alternative would have the most co-located corridor
12 options and would, therefore, have the lowest amount of new impervious surface. This would
13 result in the lowest anticipated amount of new runoff and lowest reduction in groundwater
14 infiltration compared with the other two alternatives. Additionally, portions of two corridors
15 utilized only by the Orange Alternative, Option K and Option Q1, occur outside active
16 management areas.

17 **Sole Source Aquifers**

18 The miles of each Build Corridor Alternative within sole source aquifers are shown in **Table**
19 **3.13-2**. The Purple, Green, and Orange Alternatives have comparable lengths within the Upper
20 Santa Cruz and Avra Valley Sole Source Aquifer. However, the Orange Alternative is expected
21 to have fewer impacts on sole source aquifers because it contains the greatest length of co-
22 located corridor and would, therefore, have the lowest amount of new impervious surface and
23 other disturbance.

24 **Table 3.13-2. Sole Source Aquifers in the 2,000-foot-wide Build Corridor**
25 **Alternatives**

Sole Source Aquifer	Purple Alternative ^a	Green Alternative	Orange Alternative	Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option
Upper Santa Cruz and Avra Valley	100.9	99.7	101.1	106.2	118.7	97.8

26 SOURCE: USEPA 2017a.

27 ^a All numbers in table rounded to the nearest 0.1 mile.

28 **Groundwater Wells**

29 The number of groundwater wells within each Build Corridor Alternative is shown in **Table 3.13-**
30 **3**. Overall, impacts on groundwater wells are expected to be lowest for the Orange Alternative
31 and highest for the Green Alternative. Although the Orange Alternative would have the highest
32 number of wells within its 2,000-foot-wide corridor, this alternative would have the most corridor
33 options located within existing transportation right-of-way and is therefore anticipated to result in
34 the least disturbance to wells. The Orange Alternative would also result in the lowest amount of
35 new impervious surface and resulting runoff that could contaminate wells compared with the
36 other alternatives.



1 **Table 3.13-3. Groundwater Wells in the 2,000-foot-wide Build Corridor Alternatives**

	Purple Alternative	Green Alternative	Orange Alternative	Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option
Number of Wells	900	689	1137	887	636	1183

2 SOURCE: ADWR 2017.

3 **Impaired Waters**

4 **Table 3.13-4** shows the miles of each impaired water within 0.5 mile upstream or 1.0 mile
5 downstream of each Build Corridor Alternative. The Orange Alternative is located near an
6 impaired stretch of the Santa Cruz River north of Tucson that is not located in proximity to the
7 Purple and Green Alternatives. The Purple Alternative parallels an impaired stretch of the Gila
8 River not in proximity to the other alternatives but avoids an impaired stretch of the Gila River
9 crossed by the Green and Orange Alternatives. The Purple and Green Alternatives would both
10 cross an impaired stretch of the Hassayampa River not crossed by the Orange Alternative.

11 **Table 3.13-4. Miles of Impaired Waters in Proximity to the 2,000-foot-wide Build**
12 **Corridor Alternatives**

Impaired Water	Purple Alternative ^{a,b}	Green Alternative	Orange Alternative	Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option
Santa Cruz River	22.8	22.8	31.4	22.8	22.8	31.4
Potrero Creek	3.9	3.9	3.9	3.9	3.9	3.9
Nogales Wash	3.1	3.1	3.1	3.1	3.1	3.1
Gila River	3.6	2.3	2.3	3.6	2.3	2.3
Hassayampa River	1.4	1.4	0.0	1.4	0.0	0.0
Total	34.8	33.5	40.7	34.8	32.1	40.7

13 SOURCE: ADEQ 2018a.

14 ^a All numbers in table rounded to the nearest 0.1 mile.

15 ^b Miles of impaired waters located within 0.5 mile upstream or 1.0 mile downstream.

16
17 Overall, the Purple Alternative is anticipated to have the greatest impacts on impaired waters,
18 while the Orange Alternative is anticipated to have the lowest impacts. Although the Green and
19 Purple Alternatives would avoid an impaired segment of the Santa Cruz River north of Tucson
20 that is paralleled by the Orange Alternative, this segment of the Orange Alternative is co-located
21 with the existing I-10. The Green and Purple Alternatives would construct a new crossing over
22 an impaired segment of the Hassayampa River, which is likely to be more impactful. Similarly,
23 although the Purple Alternative would avoid crossing an impaired reach of the Gila River that is
24 crossed by the Green and Orange Alternatives, the crossing is co-located with the existing
25 SR 85. The portion of the Purple Alternative that parallels an impaired stretch of the Gila River
26 would be a new corridor. However, the Purple Alternative is situated such that if the final



1 400-foot-wide highway corridor were to run along the northern edge of the Purple Alternative's
2 2,000-foot-wide corridor, much of the highway would be located greater than 1 mile from the
3 Gila River and would likely avoid impacting impaired waters.

4 **Waters of the US**

5 **Table 3.13-5** shows the miles of potential waters of the US within each Build Corridor
6 Alternative. The greatest length of potential waters of the US occurs within the Orange
7 Alternative, while the least length occurs within the Purple Alternative. However, the Orange
8 Alternative is anticipated to have the lowest impact on potential waters of the US because it
9 mostly consists of co-located corridors. The Tres Rios Water Reclamation Facility releases
10 effluent into the Santa Cruz River; therefore, impacts on this feature would also affect waters of
11 the US. Although the Tres Rios Water Reclamation Facility is located within the corridor of the
12 Orange Alternative, the final corridor would likely be sited to avoid impacting the facility.
13 Similarly, the Orange Alternative parallels the Santa Cruz River for a substantial distance in the
14 vicinity of Tucson. If this section of co-located corridor must be widened to accommodate I-11
15 traffic, many direct impacts on the river could be avoided by widening the east side of the
16 existing highway.

17 **Table 3.13-5. Miles of Potential Waters of the US in the 2,000-foot-wide Build**
18 **Corridor Alternatives**

Potential Waters of the US	Purple Alternative ^a	Green Alternative	Orange Alternative	Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option
Santa Cruz River	1.7	2.6	6.0	3.1	2.5	6.7
Gila River	0.5	0.7	0.7	0.5	0.7	0.7
Hassayampa River	0.4	0.4	0.4	0.4	0.4	0.4
Other Named	24.2	23.2	22.3	26.3	16.0	15.1
Unnamed	259.6	301.6	429.1	276.1	303.0	289.0
Total	286.4	328.5	458.5	306.4	322.6	311.9

19 SOURCE: USGS 2019.

20 ^a All numbers in table rounded to the nearest 0.1 mile.

21
22 The Green Alternative would have the highest impacts on potential waters of the US because it
23 primarily consists of new corridors and has the potential to impact a greater length of waters
24 than the Purple Alternative. The Green Alternative also contains a 12-mile-long stretch of
25 braided channels associated with the Santa Cruz River, Los Robles Wash, the Greene Canal,
26 and other unnamed drainages in the vicinity of the Pima-Pinal County Line that would not be
27 affected under the other alternatives. The Purple Alternative would also have high impacts on
28 potential waters of the US, primarily because it would include new crossings of the Santa Cruz
29 and Gila Rivers that are avoided by the other alternatives. Although all three alternatives cross
30 the Hassayampa River; the Green and Purple Alternatives would include a new crossing while
31 the Orange Alternative is co-located with I-10.



1 **Wetlands**

2 **Table 3.13-6** shows the acres of potential wetlands and key potential wetlands within each Build
3 Corridor Alternative.

4 **Table 3.13-6. Acres of National Wetlands Inventory Wetlands and Key Potential**
5 **Wetlands in the 2,000-foot-wide Build Corridor Alternatives**

Potential Wetlands ^a	Purple Alternative	Green Alternative	Orange Alternative	Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option
NWI-mapped (acres) ^b	156	314	313	187	282	286
Santa Cruz River (B)	No	No	Yes	No	No	Yes
Rillito River (B)	No	No	Yes	No	No	Yes
Santa Cruz River (C)	Yes	No	No	Yes	No	No
Braided Channels (F)	No	Yes	No	Yes	Yes ^c	Yes ^c
Vekol Wash (I2)	Yes	Yes	No	Yes	Yes	Yes
Gila River (N)	Yes	No	No	Yes	No	No
Gila River (Q2)	No	Yes	Yes	No	Yes	Yes
Hassayampa River (R)	Yes	Yes	No	Yes	No	No

6 SOURCE: USFWS 2019.

7 ^a The corridor option associated with each crossing is indicated in parentheses.

8 ^b All numbers in table rounded to the nearest acre.

9 ^c Impacts reduced compared to the Purple, Green, Orange, and Recommended Alternative. See **Section 3.13.4.5**.

10
11 The Green and Orange Alternatives each have twice the acreage of potential wetlands within
12 their corridors than the Purple Alternative. However, the Orange Alternative is anticipated to
13 have the lowest impact on potential wetlands because it mostly consists of co-located corridors.
14 While the Purple Alternative has a lower acreage of potential wetlands within its corridor and
15 generally has a longer length of co-located options than the Green Alternative, the Purple
16 Alternative would include a new crossing of the Gila River that could impact potential wetlands.
17 The Green and Orange Alternatives would cross the Gila River via a segment co-located with
18 SR 85. Although potential wetlands are also present at this crossing, they would experience
19 fewer new impacts due to the presence of the existing highway. However, the Green Alternative
20 would include construction of a new corridor through a stretch of potential wetlands within
21 Option F that would not be impacted by the Purple or Orange Alternatives. Both the Purple and
22 Green Alternatives would include a new crossing of the Hassayampa River that could impact
23 potential wetlands. The Orange Alternative would cross the Hassayampa River via a corridor
24 co-located with I-10. As identified by geospatial data (USGS 2004), potential wetlands are not
25 likely to occur at this location because the dominant plant species are not wetland indicators
26 (USDA 2020). Therefore, both the Purple and Green Alternatives are considered to have a high
27 potential to impact wetlands.



1 **Floodplains**

2 **Table 3.13-7** shows the acres of floodplains within each Build Corridor Alternative. Overall, the
3 Green Alternative would have the highest impacts on floodplains, followed by the Purple
4 Alternative and the Orange Alternative. As a mostly new corridor, the Green Alternative would
5 result in the greatest amount of new structural fill being placed within mapped floodplains, which
6 would change flood elevations, constrict waterways, and potentially exacerbate downstream
7 flooding. The Orange Alternative would result in the least amount of new fill within mapped
8 floodplains, both because it is mostly co-located and due to the configuration of floodplains in
9 relation to the corridor. However, the Orange Alternative may impact known levees in Tucson
10 and Marana. Although the Purple Alternative has the largest acreage of mapped floodplains
11 within its corridor, its impacts would be intermediate between the Orange and Green
12 Alternatives because it has fewer co-located segments than the Orange Alternative and more
13 co-located segments than the Green Alternative.

14 **Table 3.13-7. Acres of FEMA Floodplains in the 2,000-foot-wide Build Corridor**
15 **Alternatives**

	Purple Alternative ^{a,b}	Green Alternative	Orange Alternative	Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option
Floodplains	15,534	14,926	11,263	15,817	13,261	10,809

16 SOURCE: FEMA 2017.

17 ^a All numbers in table rounded to the nearest acre.

18 ^b Refer to **Appendix E13** (Water Resources Technical Memorandum) for flood zone definitions.

19 **3.13.4.4 Recommended Alternative**

20 **Active Management Areas**

21 Active management areas within the Recommended and Preferred Alternatives are shown on
22 **Figure 3.13-10, Figure 3.13-11, and Figure 3.13-12. Table 3.13-1** shows the miles of each
23 alternative within active management areas. The Recommended Alternative has more length
24 within active management areas than the Purple, Green, or Orange Alternatives.

25 Potential effects to the CAVSARP and SAVSARP are substantially decreased under the
26 Recommended Alternative compared to the Purple and Green Alternatives. Due to an eastward
27 shift in the corridor alignment, the Recommended Alternative would completely avoid impacting
28 Basin 1 of the SAVSARP. As a result, this alternative is not anticipated to interfere with the
29 Tucson Active Management Area’s ability to meet or maintain its goal of safe-yield. The
30 eastward corridor shift also places a greater distance between the Recommended Alternative
31 and the CAVSARP and SAVSARP, thus reducing the potential for accidental hazardous
32 materials releases to impact these facilities.

33 Overall, impacts on active management areas under the Recommended Alternative are
34 expected to be lower than the Purple and Green Alternatives due its position in relation to the
35 CAVSARP and SAVSARP. Impacts on active management areas under the Recommended



1 Alternative are expected to be higher than the Orange Alternative because the Orange
2 Alternative uses more co-located corridor.

3 **Sole Source Aquifers**

4 The miles of each alternative within sole source aquifers are shown in **Table 3.13-2**. The
5 Recommended Alternative has a comparable length within sole source aquifers compared to
6 the Purple, Green, and Orange Alternatives. However, it is expected to have greater impacts on
7 sole source aquifers than the Orange Alternative because it utilizes less co-located corridor; use
8 of co-located corridor is comparable for the Purple, Green, and Recommended Alternatives
9 within sole source aquifers.

10 **Groundwater Wells**

11 Groundwater wells within the Recommended and Preferred Alternatives are shown on **Figure**
12 **3.13-10**, **Figure 3.13-11**, and **Figure 3.13-12**. The number of groundwater wells within each
13 alternative is shown in **Table 3.13-3**. Fewer wells occur within the corridor of the Recommended
14 Alternative than occur within that of the Purple and Orange Alternatives and more wells are
15 present than under the Green Alternative. However, the Recommended Alternative is expected
16 to have the greatest potential to impact wells because it utilizes less co-located corridor than the
17 Purple, Green, and Orange Alternatives and has more wells within its corridor than the Green
18 Alternative.

19 **Impaired Waters**

20 Locations of impaired waters within the Recommended and Preferred Alternatives are shown on
21 **Figure 3.13-10**, **Figure 3.13-11**, and **Figure 3.13-12**. **Table 3.13-4** shows the miles of each
22 impaired water within 0.5 mile upstream or 1.0 mile downstream of each alternative. The
23 Recommended Alternative and Purple Alternative would have equivalent impacts because both
24 alternatives utilize the same corridor options near impaired waters. Overall, these two
25 alternatives are anticipated to have the greatest impacts on impaired waters.

26 **Waters of the US**

27 **Figure 3.13-13**, **Figure 3.13-14**, and **Figure 3.13-15** show potential waters of the US within the
28 Recommended and Preferred Alternatives. **Table 3.13-5** shows the miles of potential waters of
29 the US within each alternative. The Recommended Alternative contains more potential waters of
30 the US than the Purple Alternative and fewer potential waters of the US than the Orange and
31 Green Alternatives. However, the Recommended Alternative would have higher impacts on
32 potential waters of the US than the Purple, Green, and Orange Alternatives in part because it
33 contains less co-located corridor. Further, the Recommended Alternative includes new
34 crossings of the Santa Cruz and Gila Rivers avoided by the Green and Orange Alternatives as
35 well as a new crossing of the Hassayampa River avoided by the Orange Alternative. The
36 Recommended Alternative also contains a 12-mile-long stretch of braided channels associated
37 with the Santa Cruz River, Los Robles Wash, Greene Canal, and other unnamed drainages that
38 would be avoided by the Purple and Orange Alternatives.

39

40

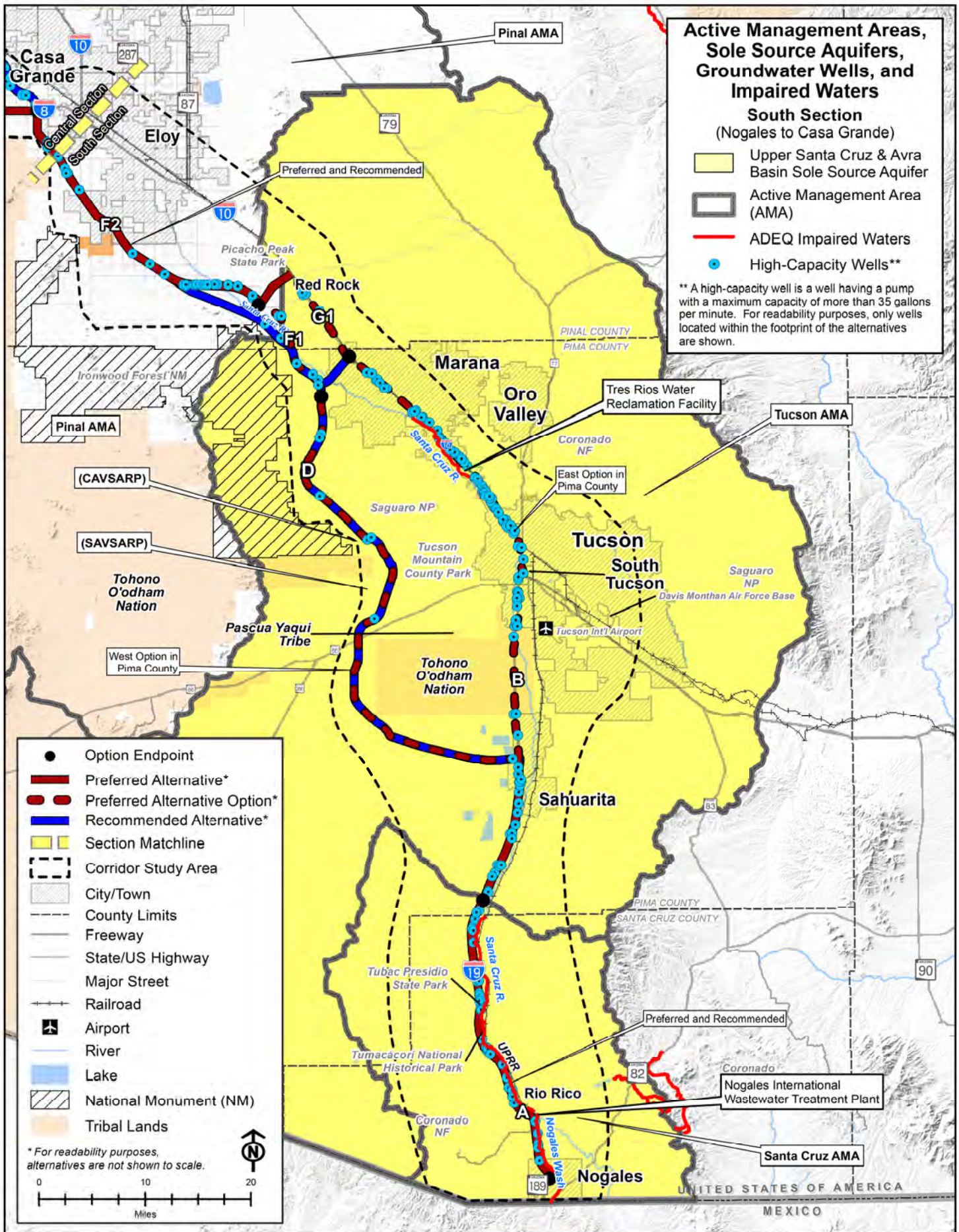


Figure 3.13-10. South Section Active Management Areas, Sole Source Aquifers, Groundwater Wells, and Impaired Waters - Recommended and Preferred Alternatives

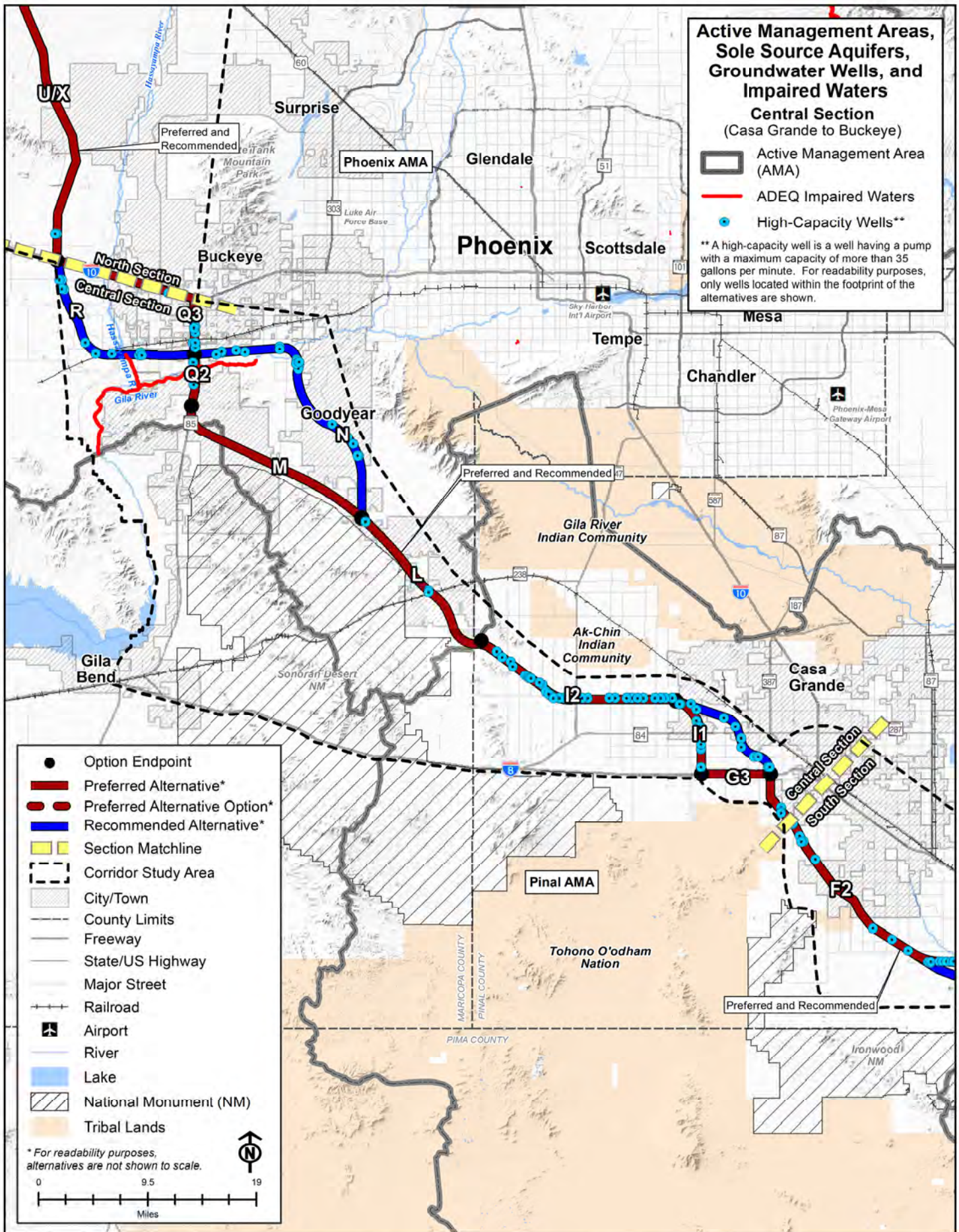


Figure 3.13-11. Central Section Active Management Areas, Sole Source Aquifers, Groundwater Wells, and Impaired Waters – Recommended and Preferred Alternatives

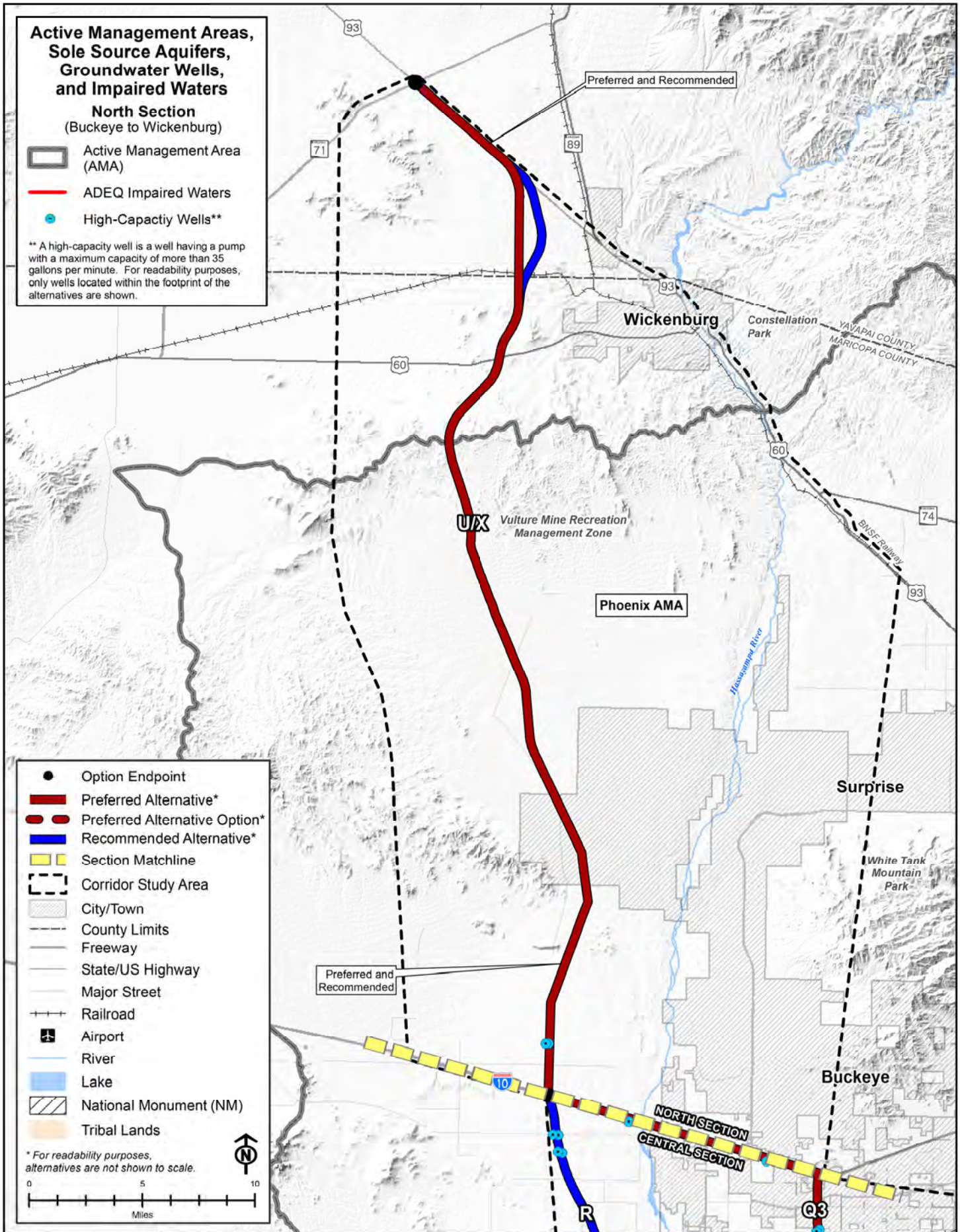


Figure 3.13-12. North Section Active Management Areas, Sole Source Aquifers, Groundwater Wells, and Impaired Waters - Recommended and Preferred Alternatives

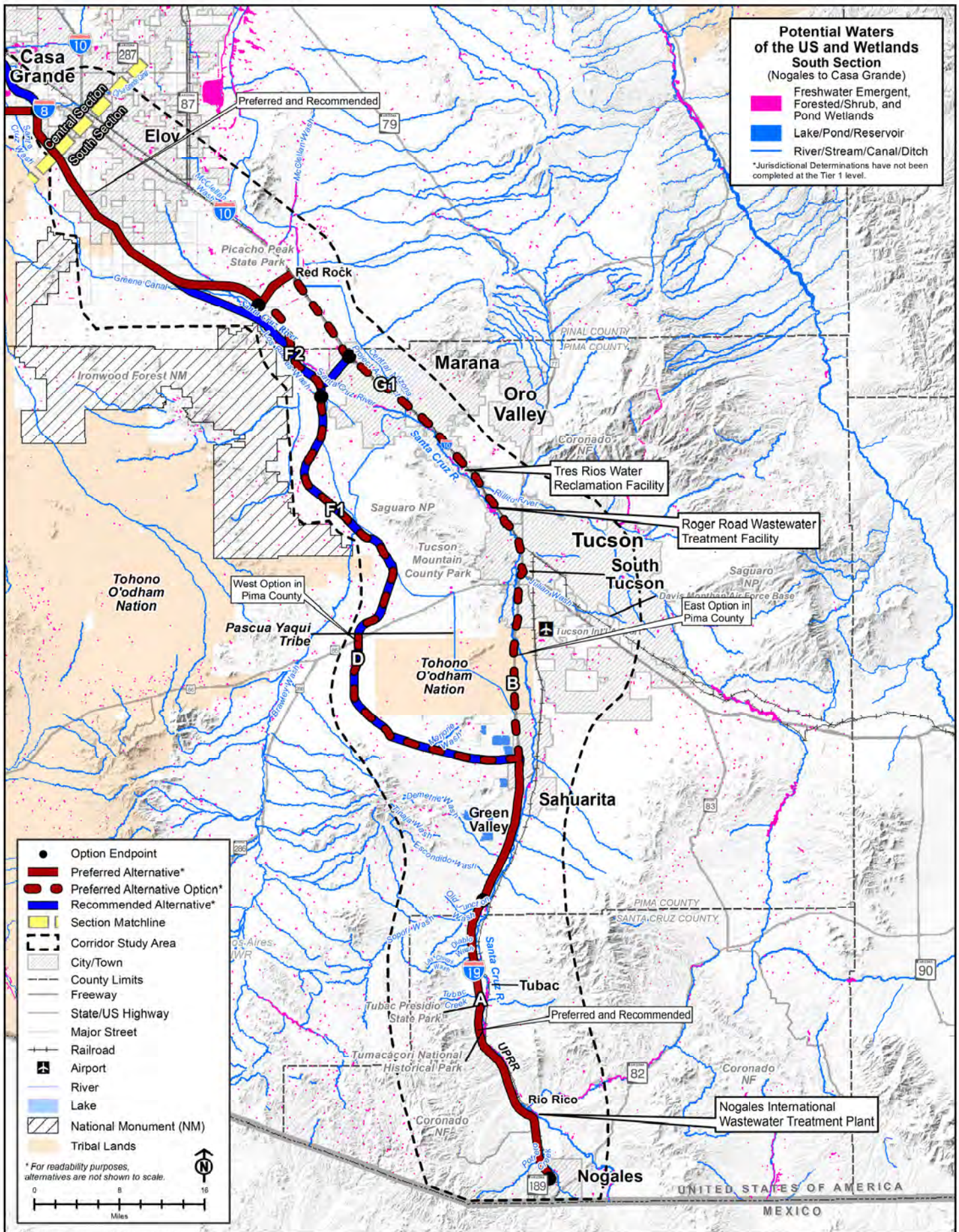


Figure 3.13-13. South Section Potential Waters of the US and Wetlands - Recommended and Preferred Alternatives

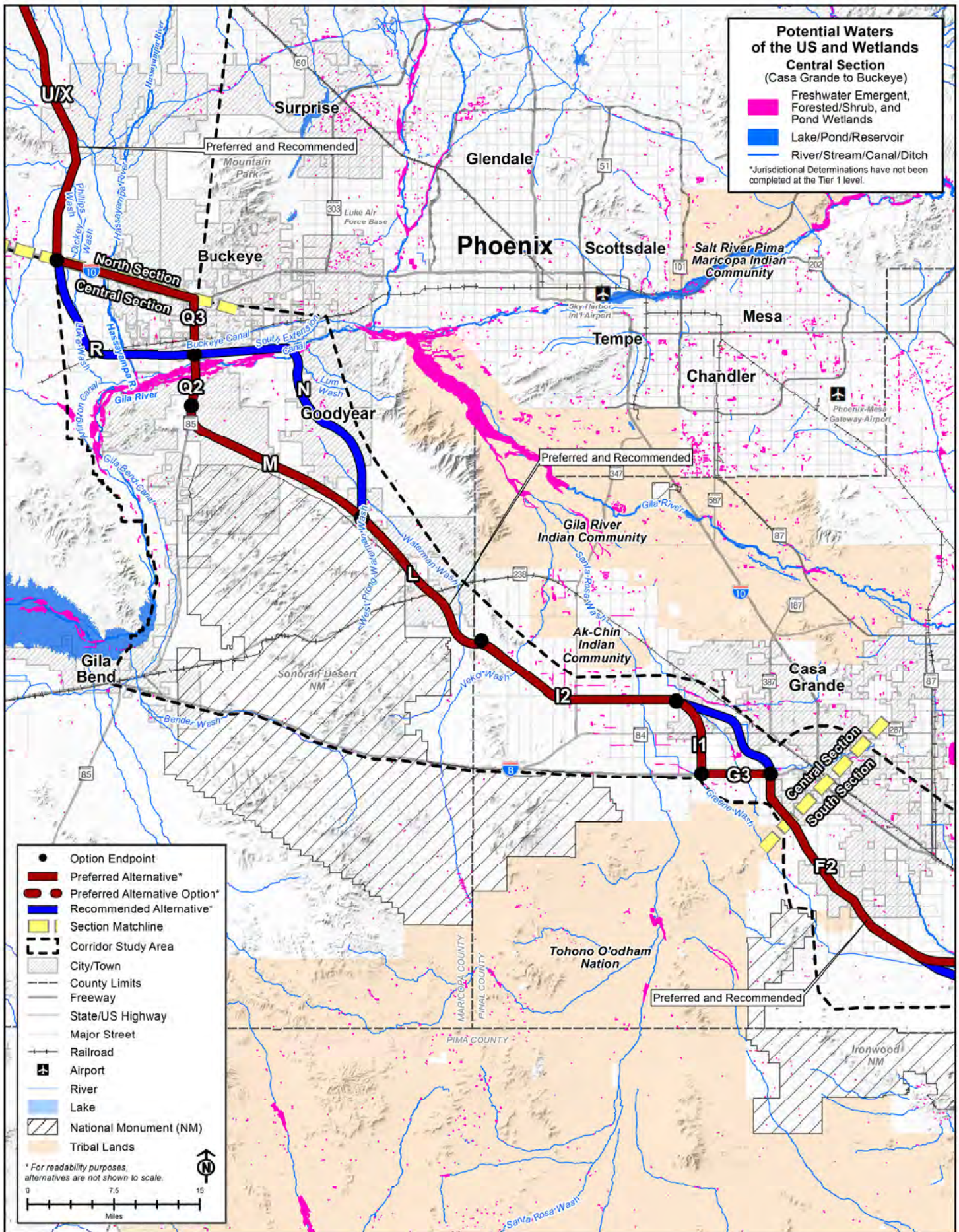


Figure 3.13-14. Central Section Potential Waters of the US and Wetlands - Recommended and Preferred Alternatives

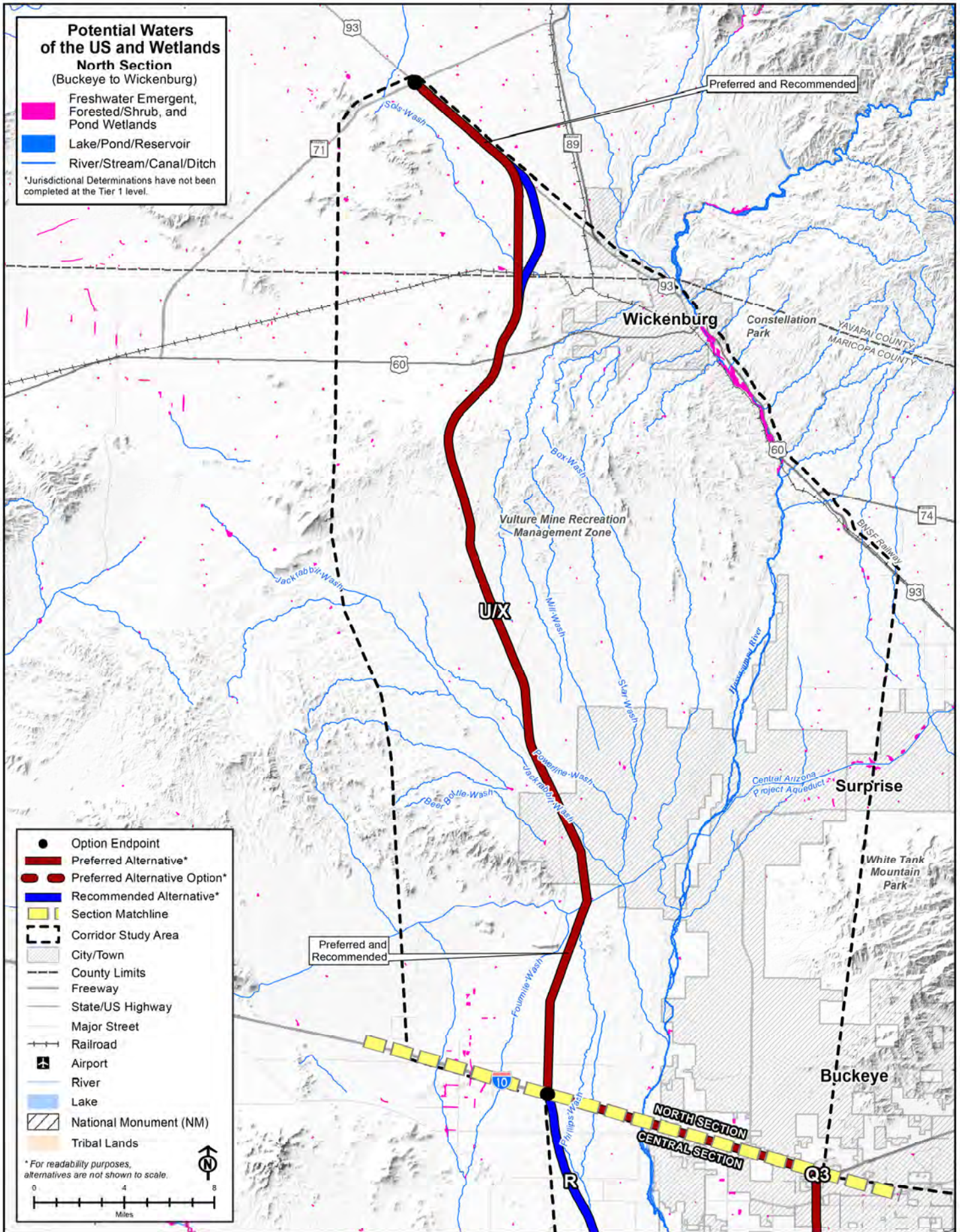


Figure 3.13-15. North Section Potential Waters of the US and Wetlands – Recommended and Preferred Alternatives



1 **Wetlands**

2 NWI-mapped freshwater emergent, forested/shrub, and pond wetlands are shown on **Figure**
3 **3.13-13**, **Figure 3.13-14**, and **Figure 3.13-15**. **Table 3.13-6** shows the key potential wetlands
4 and acres of potential wetlands within each alternative. The Recommended Alternative contains
5 more potential wetlands than the Purple Alternative and fewer potential wetlands than the
6 Orange and Green Alternatives. However, the Recommended Alternative would have higher
7 impacts on potential wetlands than the Purple, Green, and Orange Alternatives in part because
8 it contains less co-located corridor. For example, a large proportion of the potential wetland
9 acreage associated with the Green and Orange Alternatives is located along the Gila River
10 within a corridor co-located with SR 85. While the Recommended Alternative avoids wetlands at
11 this location, it would include a new crossing of the Gila River that could result in new impacts
12 on potential wetlands at key locations as identified during site-specific reviews. Further, the
13 Recommended Alternative includes new crossings of the Santa Cruz and Gila Rivers avoided
14 by the Green and Orange Alternatives as well as a new crossing of the Hassayampa River
15 avoided by the Orange Alternative. Potential wetlands were identified during site-specific
16 reviews at all three of these key locations. The Recommended Alternative also contains a
17 stretch of braided channels associated with the Santa Cruz River, Los Robles Wash, Greene
18 Canal, and other unnamed drainages containing potential wetlands that would be avoided by
19 the Purple and Orange Alternatives.

20 **Floodplains**

21 **Figure 3.13-16**, **Figure 3.13-17**, and **Figure 3.3-18** show areas mapped by FEMA as
22 floodplains within the Recommended and Preferred Alternatives. **Table 3.13-7** shows the acres
23 of floodplains within each alternative. The Recommended Alternative contains more floodplain
24 acreage than the Purple, Green, and Orange Alternatives. Additionally, the Recommended
25 Alternative is expected to have greater impacts on floodplains because it contains less co-
26 located corridor than the other alternatives.

27

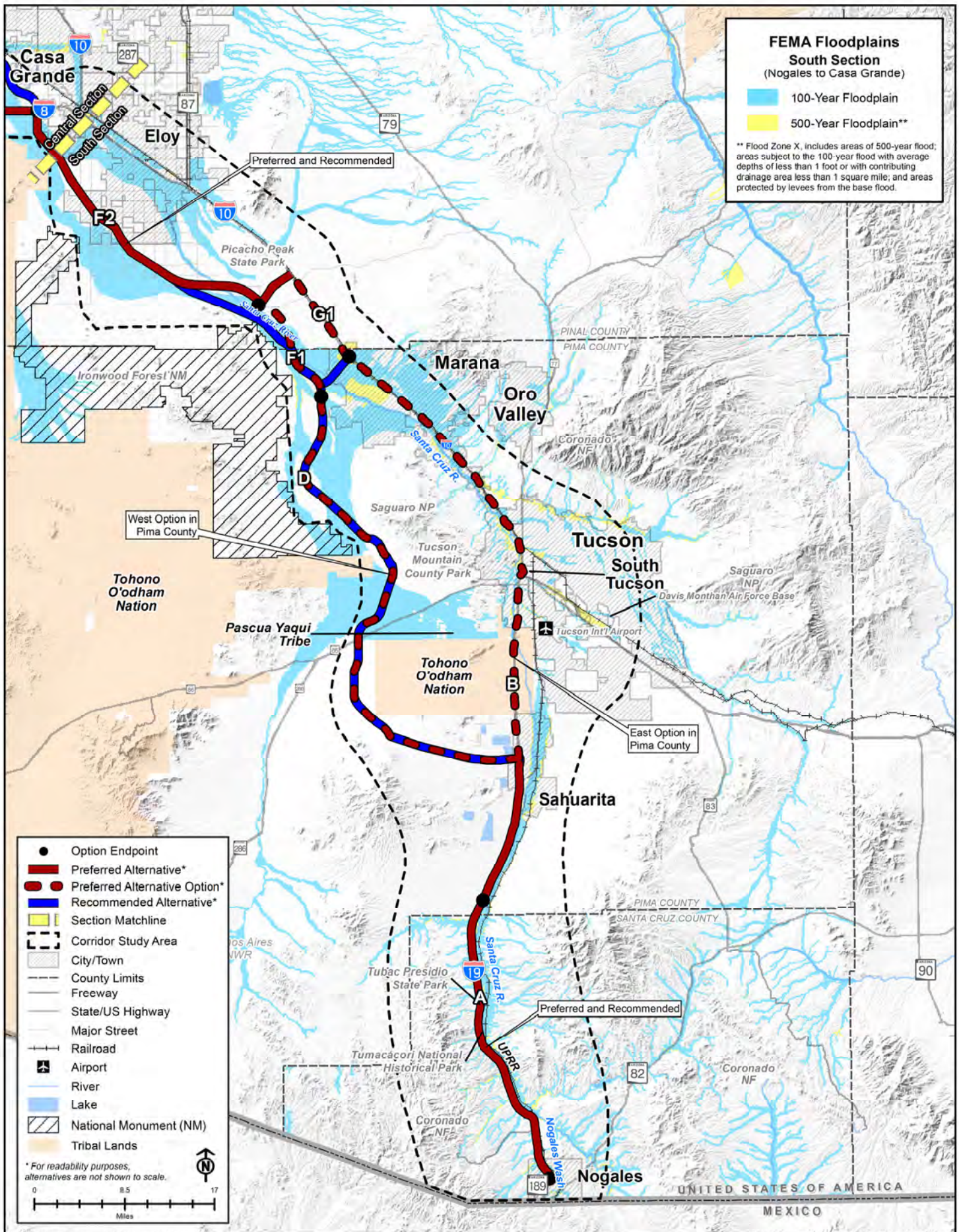


Figure 3.13-16. South Section FEMA Floodplains – Recommended and Preferred Alternatives

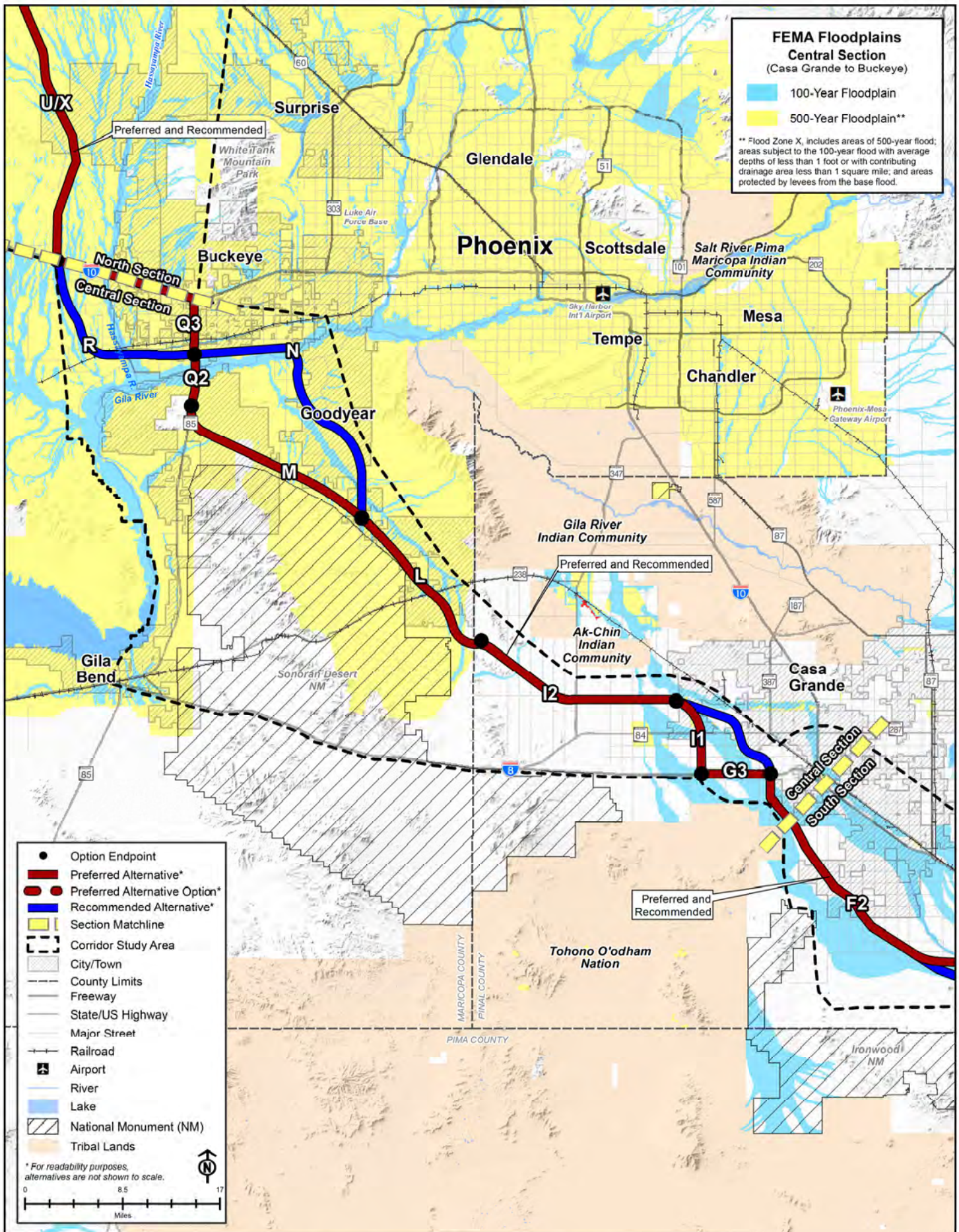


Figure 3.13-17. Central Section FEMA Floodplains – Recommended and Preferred Alternatives

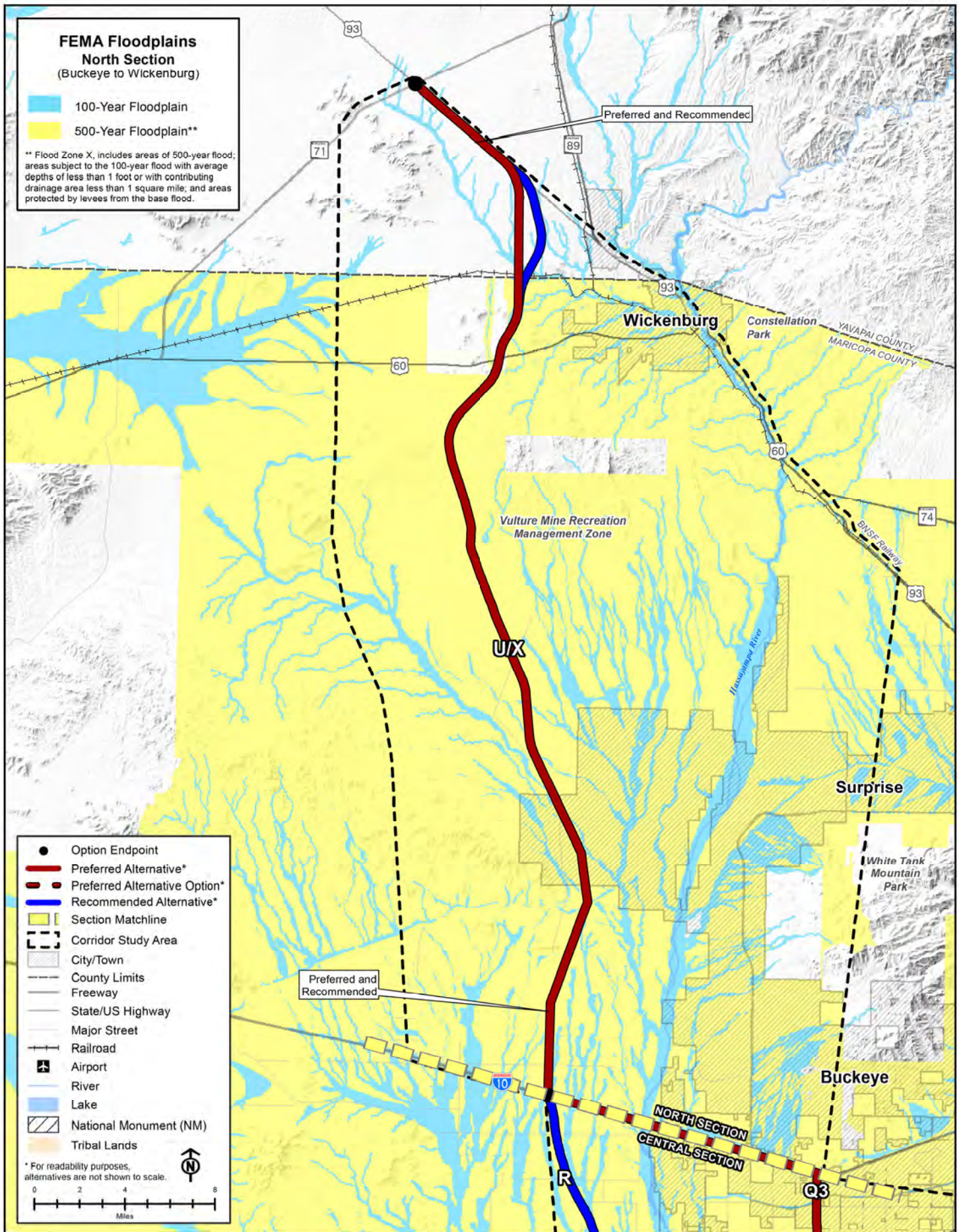


Figure 3.13-18. North Section FEMA Floodplains – Recommended and Preferred Alternatives



1 **Preferred Alternative**

2 **Active Management Areas**

3 **Table 3.13-1** shows the miles of each alternative within active management areas. The
4 Preferred Alternative west option has a greater length within active management areas than the
5 Recommended Alternative, while the Preferred Alternative east option has less length. For this
6 reason, and because the east option would include more co-located corridor than the west
7 option, the east option is anticipated to result in the fewest impacts on active management
8 areas. Because the Preferred Alternative west option would use more co-located corridor, it is
9 anticipated to result in fewer impacts on active management areas than the Recommended
10 Alternative.

11 **Sole Source Aquifers**

12 The miles of each alternative within sole source aquifers are shown in **Table 3.13-2**. The
13 Preferred Alternative west option has a greater length within sole source aquifers than the
14 Recommended Alternative, while the Preferred Alternative east option has less length. For this
15 reason, and because the east option would include more co-located corridor than the west
16 option, the east option is anticipated to result in the fewest impacts on sole source aquifers.
17 Because the Preferred Alternative west option has a greater length within sole source aquifers
18 than the Recommended Alternative and has a comparable length of co-located corridor, it is
19 anticipated to result in more impacts on sole source aquifers than the Recommended
20 Alternative.

21 **Groundwater Wells**

22 The number of groundwater wells within each alternative is shown in **Table 3.13-3**. Fewer wells
23 occur within the corridor of the Preferred Alternative west option than occur within the corridor of
24 the Recommended Alternative, which in turn has fewer wells than the Preferred Alternative east
25 option. However, the Preferred Alternative east option is anticipated to impact the fewest wells
26 because it utilizes the most co-located corridor. In addition to having fewer wells within its
27 corridor, the Preferred Alternative west option has more co-located corridor than the
28 Recommended Alternative and is therefore expected to have fewer impacts on wells.

29 **Impaired Waters**

30 **Table 3.13-4** shows the miles of each impaired water within 0.5 mile upstream or 1.0 mile
31 downstream of each alternative. The Preferred Alternative would have fewer impacts on
32 impaired segments of the Gila and Hassayampa Rivers than the Recommended Alternative
33 because it does not parallel or include new crossings of these impaired waters. Instead, the
34 Preferred Alternative crosses the impaired segment of the Gila River within a corridor co-located
35 with SR 85 and crosses a segment of the Hassayampa River that is not impaired via a corridor
36 co-located with I-10. Of the two Preferred Alternative options, the east option would have the
37 most impacts on impaired waters because it is located along an impaired segment of the Santa
38 Cruz River that would not be impacted by the west option.



1 **Waters of the US**

2 **Table 3.13-5** shows the miles of potential waters of the US within each alternative. Both options
3 under the Preferred Alternative have a greater length of potential waters of the US within their
4 corridors than the Recommended Alternative. However, the Preferred Alternative options would
5 avoid the following new crossings of major watercourses included in the Recommended
6 Alternative.

- 7 • The Preferred Alternative west option generally follows the alignment of the Recommended
8 Alternative through southern Pinal County. However, the segment of the Recommended
9 Alternative containing a 12-mile-long stretch of braided channels associated with the Santa
10 Cruz River, Los Robles Wash, Greene Canal, and other unnamed drainages was shifted
11 eastwards under the Preferred Alternative west option and away from these features. The
12 Preferred Alternative west option would still require a new crossing of the Santa Cruz River
13 near the Pima-Pinal County Line in the southern portion of this stretch, but this crossing
14 would be perpendicular and no longer follow the river's course. The shifted alignment under
15 both options would require a new crossing of the Santa Cruz River near Eloy in the northern
16 portion of this stretch.
- 17 • The Preferred Alternative would avoid a new crossing of the Santa Cruz River at Marana
18 Road that connected the Recommended Alternative to I-10. The Preferred Alternative
19 options would use an I-10 connection farther north that does not cross the river.
- 20 • The Preferred Alternative does not include new crossings of the Gila and Hassayampa
21 Rivers. Instead, the Preferred Alternative would cross these rivers via a corridor co-located
22 with SR 85 and I-10.

23 The two Preferred Alternative options differ in their impacts on the Santa Cruz River and
24 associated watercourses. The Preferred Alternative east option would parallel the Santa Cruz
25 River for a substantial distance in the vicinity of Tucson; however, this segment is co-located
26 with I-10. Meanwhile, the east option would avoid a new crossing of the Santa Cruz River near
27 the Pima-Pinal County Line that would be constructed under the west option. Therefore, the
28 west option is expected to have greater impacts on waters of the US than the east option.

29 **Wetlands**

30 **Table 3.13-6** shows the acres of potential wetlands and key potential wetlands within each
31 alternative. Both options under the Preferred Alternative have a greater acreage of potential
32 wetlands within their corridors than the Recommended Alternative. However, the Preferred
33 Alternative options avoid potential wetlands identified during site-specific reviews at the
34 following key locations that would be affected under the Recommended Alternative.

- 35 • The Preferred Alternative west option generally follows the alignment of the Recommended
36 Alternative through southern Pinal County. However, the segment of the Recommended
37 Alternative containing potential wetlands along a stretch of braided channels associated with
38 the Santa Cruz River, Los Robles Wash, Greene Canal, and other unnamed drainages was
39 shifted eastwards under the Preferred Alternative west option and away from these features.
40 The Preferred Alternative west option would still require a new crossing of potential wetlands
41 along the Santa Cruz River near the Pima-Pinal County Line in the southern portion of this
42 stretch, but this crossing would be perpendicular and no longer follow the river's course. The



1 shifted alignment under both options would require a new crossing of the Santa Cruz River
2 near Eloy in the northern portion of this stretch. As identified by geospatial data (USGS
3 2004), vegetation at this location is not dominated by wetland indicator species; therefore,
4 wetlands are not considered likely to be present.

5 • The Preferred Alternative avoids potential wetlands at a new crossing of the Santa Cruz
6 River in western Marana that connected the Recommended Alternative to I-10. The
7 Preferred Alternative options use an I-10 connection farther north that does not cross the
8 river.

9 • The Preferred Alternative does not include new crossings of the Gila and Hassayampa
10 Rivers. Instead, the Preferred Alternative crosses these rivers via a corridor co-located with
11 SR 85 and I-10. Much of the acreage of potential wetlands identified by the NWI (USFWS
12 2019) occurs at the co-located crossing of the Gila River.

13 The two Preferred Alternative options differ in their impacts on potential wetlands along the
14 Santa Cruz River and associated watercourses. The Preferred Alternative east option would
15 avoid a new crossing of the Santa Cruz River near the Pima-Pinal County Line that would be
16 constructed under the west option. Therefore, the west option is expected to have greater
17 impacts on potential wetlands than the east option.

18 Floodplains

19 **Table 3.13-7** shows the acres of floodplains within each alternative. Both Preferred Alternative
20 options have less acreage of floodplain within their corridors than the Recommended
21 Alternative. The Preferred Alternative east option would have fewer impacts on floodplains than
22 the west option because it contains less acreage within its corridor and because it contains
23 more co-located corridor.

24 **3.13.4.5 Summary**

25 This section ranks impacts of the various Build Corridor Alternatives to water resources as a
26 whole relative to one another. Rankings reflect both the quantitative and qualitative
27 assessments presented in the preceding sections. As a result, the rankings are themselves
28 qualitative. **Table 3.13-8** ranks the relative impacts on water resources for the Purple, Green,
29 and Orange Alternatives as well as the No Build Alternative. **Table 3.13-9** ranks the impacts on
30 water resources of the Recommended Alternative relative to the Purple, Green, and Orange
31 Alternatives. **Table 3.13-10** ranks the relative impacts on water resources of the two Preferred
32 Alternative options relative to the Recommended Alternative and to one another. **Table 3.13-11**,
33 located at the end of this section, summarizes the impact differences among the Build Corridor
34 Alternatives.

35 Of the Purple, Green, and Orange Alternatives, the Green Alternative would be the most
36 impactful to water resources as a whole and the Orange Alternative would be the least
37 impactful. In general, this is because the Orange Alternative shares more corridor options with
38 existing transportation facilities, meaning that there would be fewer new water resources
39 impacted.



1 **Table 3.13-8. Comparison of the Potential Impacts on Water Resources in the**
2 **2,000-foot-wide Corridors of the Purple, Green, and Orange Alternatives**

Resource	Purple Alternative	Green Alternative	Orange Alternative
Active Management Areas	Highest	Intermediate	Lowest
Sole Source Aquifers	Comparable	Comparable	Lowest
Groundwater Wells	Intermediate	Highest	Lowest
Impaired Waters	Highest	Intermediate	Lowest
Potential Waters of the US	Intermediate	Highest	Lowest
Potential Wetlands	Highest ^a	Highest ^a	Lowest
Floodplains	Intermediate	Highest	Lowest

3 ^a The Purple and Green Alternatives both have high potential impacts on potential wetlands compared to the Orange Alternative.
4 These impacts are not comparable because they affect different wetlands.

5 **Table 3.13-9. Comparison of the Potential Impacts on Water Resources in the**
6 **2,000-foot-wide Corridors of the Recommended Alternative to the Purple, Green,**
7 **and Orange Alternatives**

Resource	Purple Alternative ^a	Green Alternative ^a	Orange Alternative ^a
Active Management Areas	Lower	Lower	Higher
Sole Source Aquifers	Comparable	Comparable	Higher
Groundwater Wells	Higher	Higher	Higher
Impaired Waters	Equivalent	Higher	Higher
Potential Waters of the US	Higher	Higher	Higher
Potential Wetlands	Higher	Higher	Higher
Floodplains	Higher	Higher	Higher

8 ^a Lower indicates that the Recommended Alternative would have fewer impacts than the Purple, Green, or Orange Alternatives,
9 while Higher indicates the Recommended Alternative would have more impacts.

10 **Table 3.13-10. Comparison of the Potential Impacts on Water Resources in the**
11 **2,000-foot-wide Corridors of the Recommended and Preferred Alternatives**

Resource	Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option
Active Management Areas	Highest	Intermediate	Lowest
Sole Source Aquifers	Intermediate	Highest	Lowest
Groundwater Wells	Highest	Intermediate	Lowest
Impaired Waters	Highest	Lowest	Intermediate
Potential Waters of the US	Highest	Intermediate	Lowest
Potential Wetlands	Highest	Intermediate	Lowest
Floodplains	Highest	Intermediate	Lowest

12



1 Overall, the Recommended Alternative would have higher impacts on water resources than the
2 Purple, Green, or Orange Alternatives primarily because it utilizes the least co-located corridors.

3 Overall, the Preferred Alternative would have fewer impacts on water resources than the
4 Recommended Alternative primarily because it utilizes the more co-located corridor. Similarly,
5 the Preferred Alternative east option would have fewer impacts on water resources than the
6 west option mainly because it uses more co-located corridors. Although the Preferred
7 Alternative does not result in the least amount of overall impacts to potential waters of the US, it
8 does result in a reduction of impacts to sensitive wetlands by avoiding these areas on the Santa
9 Cruz River in southern Pinal County and eliminating a new crossing of the Gila River near
10 Buckeye and a new crossing of the Hassayampa River west of SR 85 in the Palo Verde area.
11 Therefore, any Tier 2 alternatives developed within the Preferred Alternative corridor are more
12 likely to comply with the Section 404(b)(1) guidelines and contain the Least Environmentally
13 Damaging Practicable Alternative (40 CFR 230.10(a)1-3).

14 **3.13.5 Mitigation and Tier 2 Analysis**

15 **3.13.5.1 Tier 2 Analysis Commitments**

16 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
17 2,000-foot-wide corridor for the Preferred Alternative. Additional analysis in Tier 2 will inform
18 (1) the selection of a specific alignment within the selected 2,000-foot-wide corridor and (2) the
19 selection of the west or east option in Pima County. Tier 2 analysis will also identify measures to
20 avoid, minimize, or mitigate impacts on water resources. Specifically, ADOT commits to carrying
21 out the following analysis during the Tier 2 process:

- 22 • **T2-Water Resources-1:** Coordinate with USEPA regarding proposed construction within
23 sole source aquifers.
- 24 • **T2-Water Resources-2:** Conduct field delineations of potential waters of the US and
25 wetlands within the final project footprint, determine which potential waters of the US and
26 wetlands are jurisdictional under the USACE definition, and identify specific CWA permitting
27 requirements and mitigation. Tier 2 analyses will consider the requirement that no discharge
28 of dredged or fill materials may be permitted if there is a practicable alternative that would
29 have less adverse impact on the aquatic ecosystem.
- 30 • **T2-Water Resources-3:** Provide clear documentation of the Tier 1 alternatives analyses
31 and selection process to inform the CWA Section 404 permitting process. Conduct an
32 alternative analysis and selection process for Tier 2 alternatives in support of CWA Section
33 404 Individual Permit applications and per the requirements of EO 11990.
- 34 • **T2-Water Resources-4:** Assess which MS4 applies in which area, and whether any small
35 operators (Phase II MS4s) are located within the Tier 2 study area.
- 36 • **T2-Water Resources-5:** Identify USACE civil works projects that may be altered by project
37 construction and obtain USACE approval prior to alteration of such projects as required by
38 Section 14 of the Rivers and Harbors Act.



- 1 • **T2-Water Resources-6:** Identify and assess project effects to unmapped floodplains,
2 levees, and flood control basins that may be altered by project construction. Provide flood
3 control districts and jurisdictions the opportunity to provide information regarding unmapped
4 floodplains, levees, and flood control basins.
- 5 • **T2-Water Resources-7:** Conduct hydraulic computer modeling or other assessments of
6 impacts on floodplains. Coordinate with local floodplain administrators to discuss the need
7 for Floodplain Use Permits and mitigation. Assess impacts on high-hazard flood areas
8 versus low-hazard (500-year-flood zone) areas and assess floodplain areas that have not
9 been categorized in more detail; additional information sources such as Pima County's
10 mapped regulatory riparian resources may be used to inform this analysis. Assess existing
11 floodplain issues and potential solutions. An avoidance alternative outside of the 2,000-foot
12 corridor may be considered.

13 3.13.5.2 Mitigation Commitments

14 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
15 impacts on water resources from the Project (generally referred to as mitigation measures)
16 during this Tier 1 process. Such strategies are required by many of the federal and state
17 regulations described in **Section 3.13.1**.

18 The movement and use of hazardous materials present exposure risk from accidental releases
19 and spills. The potential for such releases to impact water resources would be minimized in
20 accordance with local, state, and federal design standards; freight transportation regulations;
21 and management requirements for specific hazardous substances. Further discussion of
22 mitigation strategies and best management practices regarding hazardous materials is included
23 in **Section 3.11** (Hazardous Materials).

24 Specific mitigation that ADOT is committing to implement if a Build Alternative is selected
25 includes:

- 26 • **MM-Water Resources-1:** Develop location-specific avoidance, minimization, and mitigation
27 measures for water resources. Avoid and minimize impacts on waters of the US, including
28 wetlands, to the maximum extent practicable.
- 29 • **MM-Water Resources-2:** Incorporate best management practices designed to reduce
30 erosion, minimize sedimentation, and eliminate non-stormwater pollutants into the project
31 design. Standard best management practices are identified in ADOT's *Erosion and Pollution*
32 *Control Manual for Highway Design and Construction* (2012) and ADOT's *Standard*
33 *Specifications for Road and Bridge Construction* (2008). The most recent versions of these
34 design standards will apply during Tier 2 analysis. Among others, restrictions and
35 requirements that will be incorporated during construction include the following:
- 36 ○ Wastewater will be contained and disposed of at an approved off-site location.
- 37 ○ No equipment refueling will occur within drainages.
- 38 ○ The contractor will keep a regulated work area free of litter and trash.



- 1 ○ The contractor will remove all construction material and debris from the construction site
- 2 upon completion of the project.

- 3 ● **MM-Water Resources-3:** Site the final corridor footprint to avoid sensitive water resources
- 4 to the maximum extent practicable. Examples of resources that could be avoided through
- 5 strategic footprint siting include the Tres Rios Water Reclamation Facility, Sweetwater
- 6 Wetlands Park, certain segments of the Santa Cruz River, and the Nogales International
- 7 Wastewater Treatment Plant, among others.

- 8 ● **MM-Water Resources-4:** Comply with federal, state, and local regulations pertaining to
- 9 water resources and acquire the necessary permits and approvals prior to project
- 10 construction.

- 11 ● **MM-Water Resources-5:** Coordinate with federal, state, and local jurisdictions as
- 12 appropriate to identify water resources of concern and to develop strategies to avoid and
- 13 minimize impacts.

14 **3.13.5.3 Additional Mitigation to be Evaluated in Tier 2**

15 During the Tier 2 process, ADOT will evaluate mitigation measures to include design features,
16 best management practices, permit requirements, and/or other mitigation strategies suggested
17 by agencies or the public. Such measures may be structural or non-structural in nature.
18 Structural measures are intended to permanently slow stormwater runoff, retain pollutants, and
19 reduce disturbance within drainages. Non-structural measures include temporary or ongoing
20 procedures and policies to reduce impacts on water resources implemented during facility
21 construction and post-construction maintenance.

22 Examples of permanent measures that ADOT may evaluate in Tier 2 include:

- 23 ● Incorporate check dams into the project design to slow water before it enters waterways or
- 24 wetlands.

- 25 ● Design bridges to span drainages or reduce the number of piers within waters.

- 26 ● Use self-cleaning culverts.

- 27 ● Use retention ponds to hold water long enough to allow sediments and other pollutants to
- 28 settle out.

- 29 ● Locate rest stops away from drainages.

30 Examples of temporary or ongoing measures that ADOT may evaluate in Tier 2 include:

- 31 ● Use wattles around the work area to capture sediment during the construction phase.

- 32 ● Use tracking pads so that equipment does not carry sediment onto roadway surfaces during
- 33 the construction phase.

- 34 ● Sweep adjacent roadways daily to pick up sediment that the tracking pads do not catch.



- 1 • Limit the work area to avoid sensitive areas such as wetlands. Place protective material over
- 2 wetlands before any temporary fill or equipment crossings occur and remove all materials
- 3 after work is completed.

- 4 • Stabilize disturbed areas as soon as possible after work is completed.

- 5 • Limit the use of fertilizers along highways or at rest stops.

- 6 • Provide bags and regulations for picking up dog waste at rest stops.

- 7 • Design features to capture stormwater runoff for supplemental irrigation of landscaping.

- 8



1 **3.14 Biological Resources**

2 **3.14.1 Summary of Draft Tier 1 EIS**

3 The Project Team identified biological resources by coordinating with local, state, and federal
4 agencies and by reviewing available literature, websites, and digital spatial data. The regulatory
5 framework for biological resources includes federal laws, regulations, and executive orders,
6 state laws and regulations, and local ordinances and plans. The Orange Alternative overall
7 would have the least potential direct impacts on biological resources, mainly because this
8 alternative would be the most co-located along existing transportation corridors. In contrast, the
9 Green Alternative, which has a larger amount of new alignment compared to the other
10 alternatives, and based on its greater impacts to riparian areas and to wildlife connectivity,
11 would cause the most deleterious impacts to biotic communities, Important Bird Areas, Species
12 of Economic and Recreational Importance, and special status species, compared to the other
13 alternatives. The Green Alternative also would have the greatest potential to increase the
14 spread of invasive species compared to the other alternatives. The biological resources that
15 were investigated are described in the following sections, along with a summary comparison of
16 the alternatives.

17 **3.14.1.1 Biotic Communities**

18 The Purple Alternative, followed by the Green Alternative, would impact the greatest surface
19 area of biotic communities overall. The overall footprint of the Orange Alternative, and to a
20 lesser extent that of the Purple Alternative, would be reduced compared to the Green
21 Alternative because these two alternatives would be partially co-located along existing
22 transportation routes.

23 The Green Alternative would have the greatest potential impact to overall riparian habitat
24 because it parallels the Santa Cruz River to a greater extent than the other alternatives.
25 However, even though the Purple Alternative would have a smaller surface area of impacts to
26 overall riparian habitat than the Green Alternative, it may have the greatest impact to perennial
27 riparian areas due to the new crossing of the Gila River. The Orange Alternative would have the
28 least potential impact to riparian habitat.

29 The Purple Alternative would have the greatest potential impact to Important Bird Areas
30 because it introduces a new crossing of the Gila River and then parallels the river. The Orange
31 Alternative would have the least potential impact to Important Bird Areas as it crosses the Gila
32 River along the existing SR 85 alignment.

33 All Build Corridor Alternatives would result in loss of potential habitat and impact species
34 movement within the vicinity of the I-11 Corridor. The Green and Purple Alternatives would have
35 the greatest potential to impact Species of Economic and Recreational Importance. The Orange
36 Alternative would have the least potential direct impact on habitat for Species of Economic and
37 Recreational Importance because this alternative would be the most co-located along existing
38 transportation corridors. The Orange Alternative would likely have the smallest impact (the least
39 increase in wildlife mortality).



1 The Purple and Green Alternatives would generate an increased threat of noxious and invasive
2 species spreading and impacting native species along new alignments in rural, undeveloped
3 areas. The Orange Alternative would be co-located along the existing highway in the South and
4 Central Sections where many noxious and invasive species have already become established.
5 As such, the Orange Alternative would likely have the least impact of the three Build Corridor
6 Alternatives.

7 3.14.1.2 Special Status Species

8 All Build Corridor Alternatives could impact Endangered Species Act (ESA)-listed species
9 associated with the Santa Cruz River. Unlike the Green and Orange Alternatives, the Purple
10 Alternative would require a new crossing of the Gila River in yellow-billed cuckoo (*Coccyzus*
11 *americanus*) and southwestern willow flycatcher (*Empidonax traillii extimus*) habitat. A portion of
12 the Purple Alternative and Green Alternative would likely impact Pima pineapple cactus
13 (*Coryphantha scheeri* var. *robustispina*); substantial compensatory mitigation would be required
14 to avoid a Jeopardy decision by USFWS. The Orange Alternative would also likely impact Pima
15 pineapple cactus, but would require less ground disturbance, such that a Jeopardy decision by
16 USFWS is less likely. The Purple and Green Alternatives, which bisect Avra Valley, would likely
17 have the greatest impacts to parcels of land set aside as conservation areas by the *City of*
18 *Tucson Habitat Conservation Plan* (City of Tucson 2018), which provides specific conservation
19 measures to protect ESA-listed species.

20 None of the Build Corridor Alternatives would impact critical habitat for the Chiricahua leopard
21 frog (*Lithobates chiricahuensis*), southwestern willow flycatcher, and western yellow-billed
22 cuckoo associated with the Santa Cruz River. All the Build Corridor Alternatives could impact
23 critical habitat and proposed critical habitat associated with the Santa Cruz River for the
24 southwestern willow flycatcher and western yellow-billed cuckoo. Unlike the Green and Orange
25 Alternatives, the Purple Alternative would require a new crossing of the Gila River in critical
26 habitat for yellow-billed cuckoo, and in habitat for the southwestern willow flycatcher and Yuma
27 Ridgway's rail (*Rallus obsoletus yumanensis*).

28 The three Build Corridor Alternatives would have similar surface areas of habitat loss in the
29 North Section; however, the Green Alternative would likely result in the largest amount of habitat
30 loss and potential impacts to other sensitive species in the South and Central Sections. The
31 Orange Alternative would have the least impact on other sensitive species because it contains
32 the most co-located options and the smallest surface area of impacts to biotic communities.

33 3.14.1.3 Wildlife Connectivity

34 The Green Alternative is primarily situated in areas without existing major highways and
35 therefore would introduce more highway infrastructure within wildlife corridors than the Purple or
36 Orange Alternatives. The Orange Alternative is the most co-located alternative with existing
37 transportation routes and therefore would have the least potential negative impacts to wildlife
38 connectivity.

39 3.14.2 Summary of Changes Since Draft Tier 1 EIS

40 The following summarizes substantive comments on the Draft Tier 1 EIS and changes to
41 analysis or descriptions of affected environment and environmental consequences based on the



1 comments received. **Appendix E14** (Biological Resources Technical Memorandum) in the Final
2 Tier 1 EIS was also updated.

3 Pima County, the DOI, and the Coalition for Sonoran Desert Protection requested that the text
4 on the Pima County Conservation Lands System and other Pima County ordinances be
5 updated, and that potential effects to Pima County's Conservation Lands System be analyzed.
6 Therefore, the following changes were made to **Appendix E14** (Biological Resources Technical
7 Memorandum).

- 8 • **Section E14.1.3** (Local Ordinances) was updated to include information on the Pima County
9 Maeveen Marie Behan Conservation Lands System and Pima County Floodplain and
10 Erosion Hazard Management Ordinance (Pima County 2010).
- 11 • **Section E14.3.2** (Habitat Conservation Plans) was updated to include more information on
12 Pima County's *Sonoran Desert Conservation Plan* (Pima County 2016b), including a
13 discussion of the Conservation Lands System and its components.
- 14 • **Section E14.3.3** (Wildlife Connectivity) was updated to include a discussion of the Pima
15 County Buffer Overlay Zone. **Table E14-4** was updated to include the Pima County Buffer
16 Overlay Zone.
- 17 • A qualitative analysis of potential effects to Pima County's Conservation Lands and the
18 Pima County Buffer Overlay Zone was added to the Purple, Green, and Orange Build
19 Corridor Alternative discussion.

20 BLM requested that BLM Wildlife Movement Corridors also be considered. BLM also pointed out
21 that the Gila River corridor was only discussed as a natural wildlife corridor, not as a designated
22 linkage, even though it is part of an important linkage identified in the Arizona Wildlife Linkages.
23 Therefore, the following changes were made:

- 24 • The Gila/Salt River Corridor Granite Reef Dam Potential Linkages Zone was added to
25 **Figure 3.14-6** and **Figure E14-12** in **Appendix E14** (Biological Resources Technical
26 Memorandum). Potential impacts were analyzed and discussed in the text.
- 27 • Additional information was included in **Appendix E14** (Biological Resources Technical
28 Memorandum) to describe the additional BLM wildlife corridors, including which corridors
29 were, and were not, added to the wildlife linkage maps.

30 AGFD requested mitigation for habitat loss throughout the corridor. Therefore, the topic "Wildlife
31 Habitat" is added to **Section 3.14.6** requiring ADOT to coordinate with AGFD to determine
32 compensation as needed. The need for this coordination was also added to **Section 3.14.6**.

33 The following changes were made to **Appendix E14** (Biological Resources Technical
34 Memorandum) due to errors discovered in the Draft Tier 1 EIS:

- 35 • **Table E14-2** was revised to show corrected acreage values of riparian habitat in the South,
36 Central, and North Sections.
- 37 • Corrections were made to **Table E14-22**. The total surface area of Large Intact Block 2D is
38 corrected to 140,605 hectares. The surface area values for Large Intact Block 2D are



- 1 corrected to Purple Alternative: 104,535 and 36,070 hectares; and Green Alternative:
2 117,003; 22,808; 787; 5; and 1 hectares.
- 3 • Corrections were also made to **Table E14-23**. The surface area values for Large Intact
4 Block Cluster 2, Green Alternative, is corrected to 5,233 (5,706) hectares. The total surface
5 area lost for the Green Alternative is corrected to 11,594 (12,067) hectares.

6 **3.14.3 No Build Alternative**

7 If the No Build Alternative is selected, I-11 would not be constructed, and vehicles would
8 continue to use the existing transportation network. Only programmed projects would be
9 implemented under this alternative, including pavement preservation and other maintenance
10 projects. The No Build Alternative would not result in impacts to biological resources beyond
11 those from already identified projects.

12 **3.14.4 Recommended Alternative**

13 The Recommended Alternative would impact biotic communities, special status species, and
14 wildlife connectivity.

15 **3.14.4.1 Biotic Communities**

16 **Table 3.14-1** summarizes the number of acres of each biotic community within the 2,000-foot-
17 wide corridor. The Recommended Alternative would impact four biotic communities. The
18 greatest impact would be to Lower Colorado River Desertscrub, followed by Arizona Upland
19 Sonoran Desertscrub, Semidesert Grassland, and Mohave Desertscrub. The Recommended
20 and Preferred Alternatives are shown on **Figure 3.14-1**, **Figure 3.14-2**, and **Figure 3.14-3** in
21 relation to biotic communities.

22 **Table 3.14-1. Summary of Biotic Communities and Acreage in the 2,000-foot-wide**
23 **Corridors of the Recommended and Preferred Alternatives**

Biotic Community	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Semidesert Grassland	14,018	13,856	9,206
Arizona Upland Sonoran Desertscrub	9,864	9,638	15,682
Lower Colorado River Desertscrub	42,656	42,771	39,432
Mohave Desertscrub	570	570	570

24

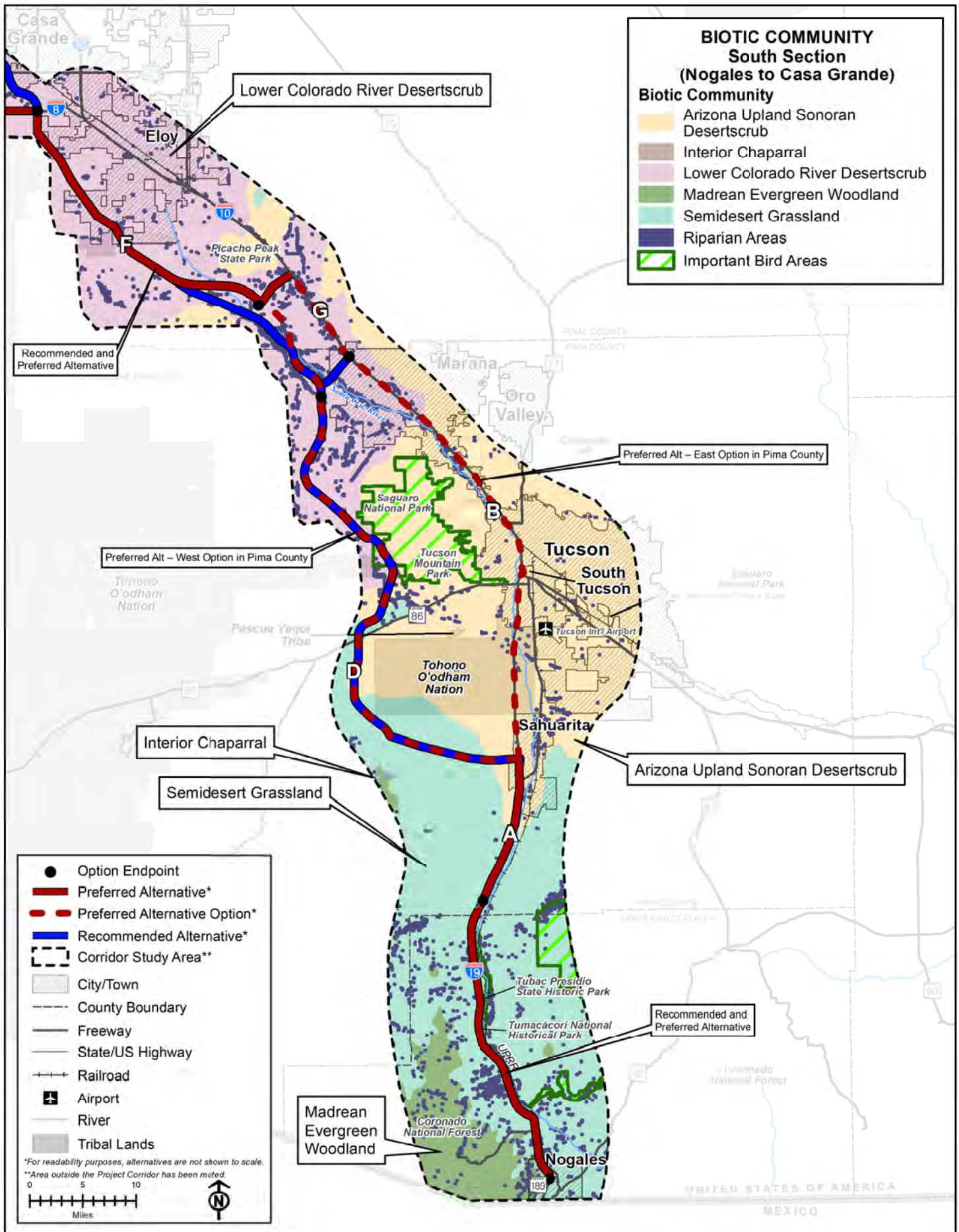


Figure 3.14-1. Biotic Communities in the South Section

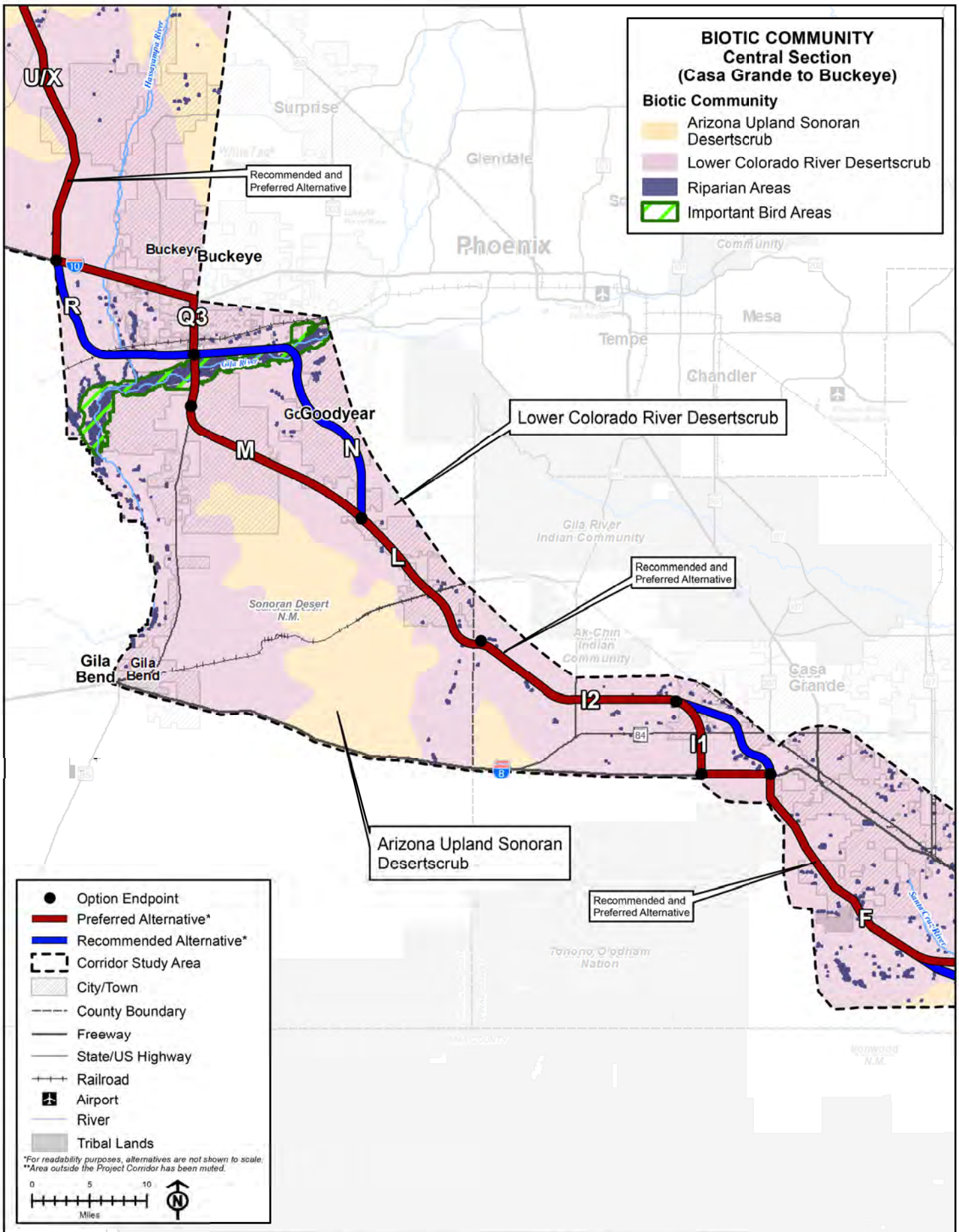


Figure 3.14-2. Biotic Communities in the Central Section

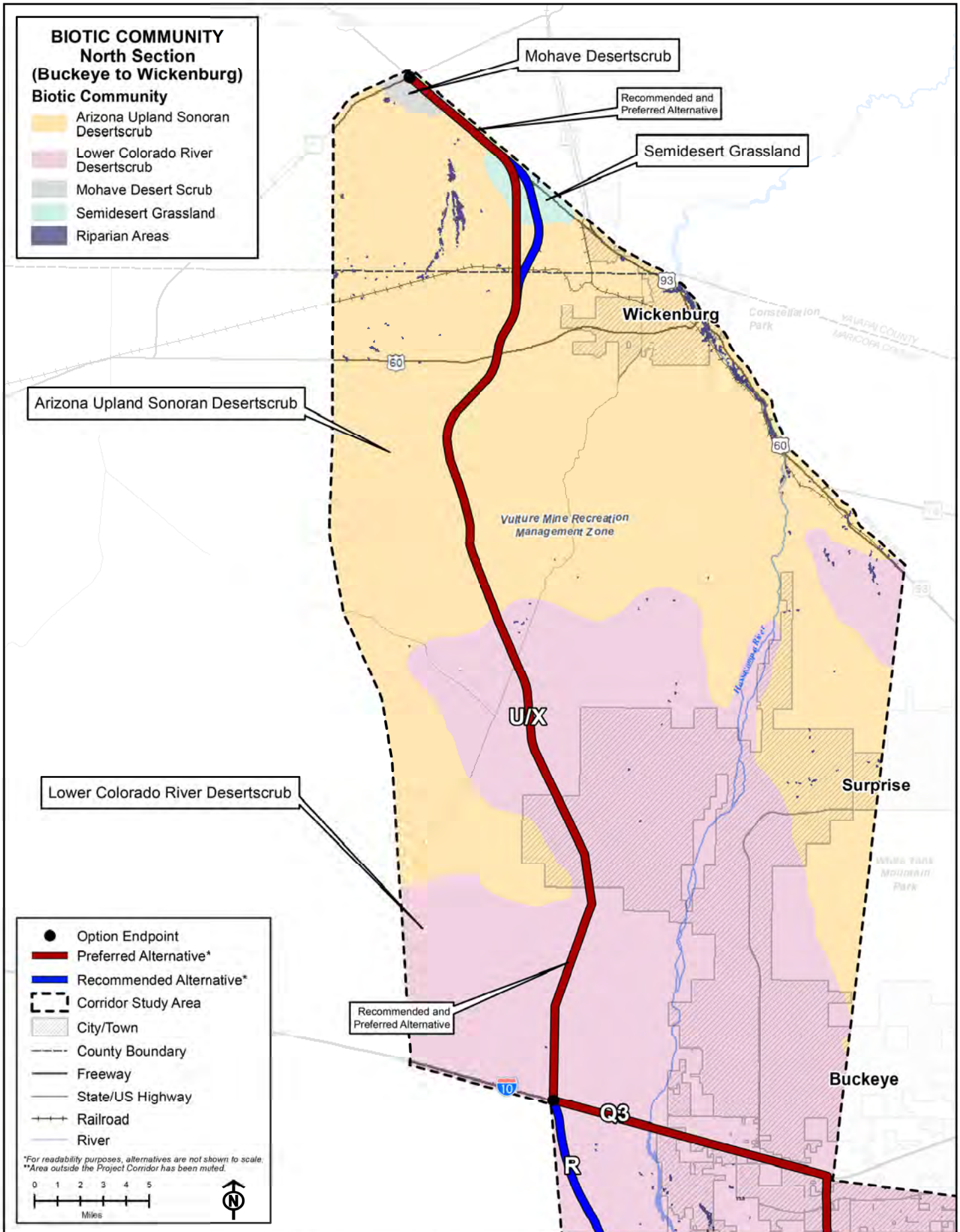


Figure 3.14-3. Biotic Communities in the North Section



1 In addition to crossing major biotic communities, the Recommended Alternative also crosses
2 unique habitat types, including several riparian areas. Several Important Bird Areas coincide
3 with riparian areas. **Table 3.14-2** summarizes the potential impacts to riparian areas and
4 Important Bird Areas for the Recommended and Preferred Alternatives.

5 **Table 3.14-2. Acreage of Riparian and Important Bird Area Habitats in the 2,000-**
6 **foot-wide Corridors of the Recommended and Preferred Alternatives**

Habitat	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Riparian Areas	1,209	694	590
Important Bird Areas	1,464	1,133	572

7
8 Direct impacts to Species of Economic and Recreational Importance and their habitat would be
9 similar to the impacts on other wildlife species within the Study Area. The Recommended
10 Alternative would result in the loss of potential habitat, and there would be potential for
11 increased mortality of Species of Economic and Recreational Importance due to animal-vehicle
12 collisions.

13 The greatest potential indirect impact during construction of the Recommended Alternative
14 would be the introduction of invasive and noxious species, particularly in areas that are currently
15 undeveloped, such as those in the area from Buckeye to Wickenburg. Surrounding lands would
16 also be impacted as invasive species gradually disperse from the roadway. The spread of
17 invasive and noxious species can negatively impact native species through the introduction of
18 interspecific competition and altered fire regimes.

19 **3.14.4.2 Special Status Species**

20 The Recommended Alternative could impact ESA-protected species and sensitive habitats
21 associated with the Santa Cruz River where the Recommended Alternative occurs along the
22 existing I-19 alignment. Co-locating I-19 and I-11 could impact ESA species by increasing air,
23 noise, and light pollution, which would further degrade habitat quality and add stress to species'
24 biological life cycles, which include breeding, feeding, and resting periods. The Recommended
25 Alternative would also span the Gila River at a new roadway crossing upstream of the existing
26 SR 85 bridge crossing. The addition of this new bridge crossing would increase the potential for
27 negative impacts to ESA species and habitat quality by increasing noise, air, and light pollution
28 in the vicinity of the Gila River. The addition of a roadway segment crossing over the Gila River
29 and through the adjacent croplands would also cause the loss of agricultural lands, which in turn
30 could reduce a source of irrigation water runoff into the Gila River. Runoff of irrigation water into
31 the Gila River at the proposed crossing is an important source of water that helps to sustain
32 riparian habitat, thereby potentially benefitting the southwestern willow flycatcher and the
33 yellow-billed cuckoo at that location, as well as the marshes that provide habitat for Yuma
34 Ridgway's rail.

35 The Recommended Alternative would also cross BLM-designated habitat and USFWS-defined
36 predicted High Value Potential Habitat for Sonoran desert tortoise (*Gopherus morafkai*), which
37 is protected by a USFWS Candidate Conservation Agreement under ESA and is a BLM



1 sensitive species (USFWS 2015a). The Recommended Alternative would also cross Mexican
2 wolf (*Canis lupus baileyi*) and Sonoran pronghorn (*Antilocapra americana sonoriensis*) USFWS
3 10(j) Experimental Populations/Reintroduction Areas (USFWS 2011, 2015a).

4 Impacts to Semidesert Grassland within the Sonoran Desert may require substantial
5 compensatory mitigation due to the likely presence of Pima pineapple cactus and its habitat
6 within this biotic community. Destruction of grassland habitat for construction of the
7 Recommended Alternative would be a permanent impact to grassland plant species, including
8 Pima pineapple cactus. Dispersal of invasive and noxious weeds into Semidesert Grassland
9 following construction of the Recommended Alternative would negatively impact ESA-listed
10 species such as Pima pineapple cactus, and Candidate Conservation Agreement species such
11 as the Sonoran desert tortoise, due to competition and altered fire regimes (USFWS 2015a).

12 The *City of Tucson Habitat Conservation Plan* (City of Tucson 2018), as well as Pima County's
13 *Sonoran Desert Conservation Plan* (Pima County 2016b), and Pima County's Conservation
14 Lands System, would be affected by the Recommended Alternative.

15 Critical habitat for several species occurs within the Recommended Alternative, including critical
16 habitat and proposed critical habitat associated with the Santa Cruz River for the southwestern
17 willow flycatcher and western yellow-billed cuckoo. In addition, proposed critical habitat for the
18 yellow-billed cuckoo and habitat for the southwestern willow flycatcher and Yuma Ridgway's rail
19 occur within the Recommended Alternative in association with the Gila River.

20 The Recommended Alternative would impact other sensitive species, which include non-ESA-
21 listed species deemed sensitive by BLM, USFS, USFWS, or the counties; species protected
22 under the Bald and Golden Eagle Protection Act; AGFD Species of Greatest Conservation
23 Need; and plant species protected under the Arizona Native Plant Law (ARS 7, Section 3-901 et
24 seq.). Impacts associated with the Recommended Alternative include the potential for mortality
25 and injury from roadway/vehicle interactions, and the direct removal of potential habitat for
26 amphibians, birds, fish, invertebrates, mammals, and reptiles. Additional impacts to animal
27 species include increased habitat degradation due to the increased noise, air, and light pollution
28 from new or improved roadway facilities.

29 The Recommended Alternative would increase accessibility into adjacent lands in Pima, Pinal,
30 and Maricopa Counties and may increase accessibility to wildlife refuges and Important Bird
31 Areas used by migratory birds and other sensitive wildlife.

32 **3.14.4.3 Wildlife Connectivity**

33 The Recommended Alternative would directly fragment AGFD Large Intact Blocks by
34 introducing a new linear facility where a roadway does not currently exist. **Figure 3.14-4** shows
35 the Recommended and Preferred Alternatives in relation to large areas of relatively intact and
36 undeveloped habitat within the Study Area. In addition to fragmentation, habitat degradation
37 would occur within Large Intact Block portions adjacent to the Recommended Alternative due to
38 increased disturbances such as noise and light pollution, and the spread of invasive species.
39 The Recommended Alternative would fragment Large Intact Blocks within Clusters 2, 4, and 6.
40 **Table 3.14-3** shows which Large Intact Blocks would be fragmented by the Recommended and
41 Preferred Alternatives, and the number and size of the Large Intact Block fragments resulting
42 from the construction of the Recommended and Preferred Alternatives.

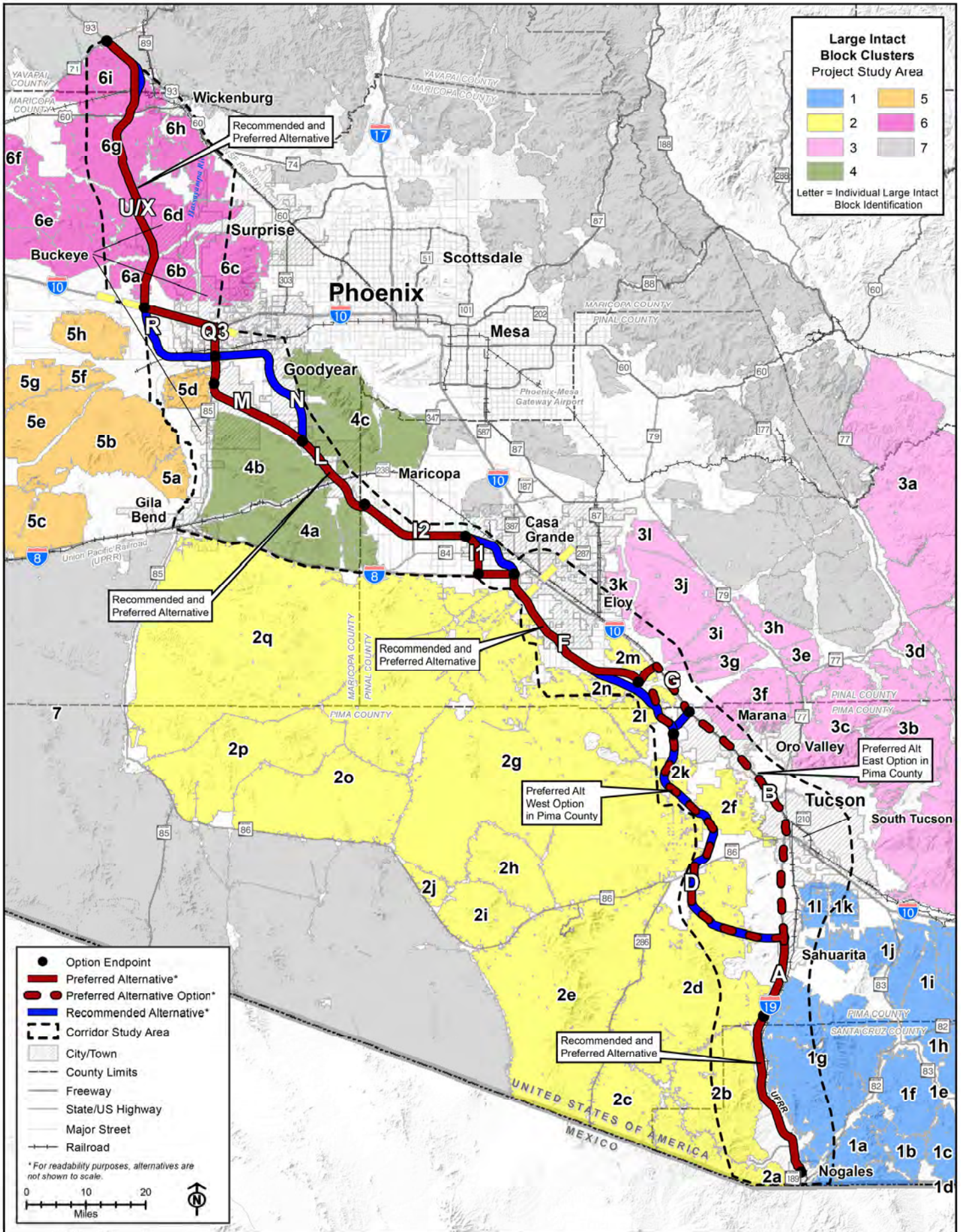


Figure 3.14-4. Large Intact Block Clusters



1 **Table 3.14-3. Summary of Large Intact Block Fragmentation and Area (hectares)**
2 **in the 2,000-foot-wide Corridors of the Recommended and Preferred Alternatives**

Large Intact Block Cluster	Large Intact Block Fragmented by Alternatives	Total Area (hectares)	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
2	2D	140,605	116,978 22,845 754 22 5 1	116,978 22,845 754 22 5 1 <1 (n=7)	–
2	2F	21,159	20,578 580	20,578 580	–
2	2G	451,786	451,537 219 30	451,537 219 30 <1	–
2	2K	5,414	5,104 243 65 2	5,104 243 65 2	–
2	2L	15,699	12,373 3,237 49 23 14 3	12,803 2,876 14 3 2 <1	–
2	2M	–	–	7,895 885 5	7,895 885 5
2	2N	6,562	6,093 469	–	–
4	4A	58,164	57,666 488 10	57,666 488 10	57,666 488 10
4	4C	74,030	73,900 92 22 16	73,923 92 16	73,923 92 16



Large Intact Block Cluster	Large Intact Block Fragmented by Alternatives	Total Area (hectares)	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
6	6A	7,410	6,911 496 2	6,911 496 2	6,911 496 2
6	6B	13,709	13,644 64	13,644 64	13,644 64
6	6D	28,436	27,059 656 628 93	27,059 656 628 93	27,059 656 628 93
6	6E	86,421	–	–	–
6	6G	42,848	29,005 13,821 16 6 <1	29,005 13,821 16 6 <1	29,005 13,821 16 6 <1
6	6I	34,479	29,712 4,756 4 4 2	28,870 5,514 54 36 4	28,870 5,514 54 36 4
Total Large Intact Blocks Fragmented			13	13	8

1 SOURCE: AGFD 2018b. Large Intact Blocks (GIS dataset). AGFD. Version LIBCategory2_I11REV.SHP. Edition Date March 19,
2 2018.

3
4 **Table 3.14-4** indicates, for the Recommended and Preferred Alternatives, the total surface area
5 represented by Large Intact Block fragments that no longer fulfill the required 5,000-hectare
6 threshold under which a habitat block is no longer considered functional in terms of wildlife
7 connectivity, following construction of the alternatives. A total of 13,072 hectares of Large Intact
8 Blocks would be reduced by the Recommended Alternative to fragments below the AGFD
9 5,000-hectare requirement.



1 **Table 3.14-4. Summary of Area (hectares) of Fragments Lost from Existing Large**
 2 **Intact Blocks in the 2,000-foot-wide Corridors of the Recommended and Preferred**
 3 **Alternatives**

Large Intact Block Cluster	Large Intact Blocks Fragmented by Alternatives	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
2	2D, 2F, 2G, 2K, 2L, 2N	5,716	5,707	889
4	4A, 4C	628	606	606
6	6A, 6B, 6D, 6E, 6G, 6I	6,728	2,055	2,055
Total		13,072	8,368	3,550

4 SOURCE: AGFD 2018b. Large Intact Blocks (GIS dataset). AGFD. Version LIBCategory2_I11REV.SHP. Edition Date March 19,
 5 2018.

6
 7 The Recommended Alternative would create new infrastructure and therefore affect habitat
 8 quality and add impediments to wildlife movement in the following wildlife connectivity features:

- 9 • Coyote-Ironwood-Tucson Detailed Linkage
- 10 • Ironwood-Picacho Linkage
- 11 • Tucson Mitigation Corridor
- 12 • Gila Bend-Sierra Estrella Linkage
- 13 • White Tank-Belmont-Hieroglyphic Mountains Linkage
- 14 • Wickenburg-Hassayampa Linkage
- 15 • Several BLM Wildlife Movement Corridors
- 16 • Pima County Buffer Overlay Zone
- 17 • Brawley Wash/Black Wash Pima County Wildlife Linkage

18 The Tucson Mitigation Corridor, which was established by the Bureau of Reclamation west of
 19 Tucson Mountain Park, preserves habitat from urbanization while maintaining an open wildlife
 20 movement corridor connecting the Tucson Mountains to Roskruge and Silver Bell Mountains. In
 21 addition, the western portion of the Tucson Mitigation Corridor occurs within the Coyote-
 22 Ironwood-Tucson Detailed Linkage. The Recommended Alternative would bisect the Tucson
 23 Mitigation Corridor and require extensive mitigation to minimize potential impacts.

24 The Recommended Alternative would contribute to the isolation of Large Intact Blocks where it
 25 is co-located with existing high-traffic highways (greater than 5,000 annual average daily traffic),
 26 and where widening would be needed. However, in these roadway segments, the potential
 27 exists to improve wildlife connectivity by implementing wildlife crossing mitigation during the



1 process of upgrading these highways to the proposed I-11. Thus, wildlife movement through the
2 following linkages could potentially be improved:

- 3 • Santa Rita-Tumacácori Linkage
- 4 • Santa Rita-Sierrita Detailed Linkage
- 5 • Gila/Salt River Corridor Granite Reef Dam Potential Linkage Zone

6 The Recommended and Preferred Alternatives are shown in relation to wildlife linkages on
7 **Figure 3.14-5, Figure 3.14-6, and Figure 3.14-7**. These figures depict wildland blocks, which
8 represent the core areas used for modeling connectivity in the Arizona Wildlife Linkages and
9 AGFD Detailed Wildlife Connectivity Designs, and other wildlife corridors. Given that multiple,
10 often overlapping, wildlife connectivity features occur in the Study Area, only features that have
11 little to no overlap with each other are represented in the figures, including the Arizona Wildlife
12 Linkages, the AGFD Detailed Wildlife Connectivity Designs, the Tucson Mitigation Corridor, and
13 the Gila/Salt River Corridor Granite Reef Dam Potential Linkage Zone.

14 **3.14.5 Preferred Alternative**

15 Overall, the Preferred Alternative, with either option (west option in Pima County or east option
16 in Pima County), is co-located with existing transportation routes to a greater extent than the
17 Recommended Alternative, and the Preferred Alternative with west option is less co-located with
18 existing routes than the Preferred Alternative with east option.

19 **3.14.5.1 Biotic Communities**

20 The Preferred Alternative, with either option, would impact a smaller surface area of Semidesert
21 Grassland and Arizona Upland Sonoran Desertscrub than the Recommended Alternative. The
22 Recommended Alternative would impact approximately 8 percent more acres of Lower
23 Colorado River Desertscrub than the Preferred Alternative with east option and would have
24 similar impacts compared to the Preferred Alternative with west option in Pima County. The
25 Recommended and Preferred Alternatives would have identical impacts on Mohave
26 Desertscrub.

27 The Preferred Alternative with east option in Pima County would have the smallest potential
28 impact to riparian habitat, including perennial riparian areas, compared to the Recommended
29 Alternative, which would have greater potential impacts because it parallels the Santa Cruz
30 River and the Gila River to a greater extent than the Preferred Alternative. The Preferred
31 Alternative with east option would also have the lowest potential impacts to Important Bird Areas
32 compared to the Recommended Alternative. For both the Recommended and Preferred
33 Alternatives, the actual impacts to riparian habitat would be much less than the impacts
34 analyzed here for the 2,000-foot-wide corridor because the final 400-foot corridor would be
35 designed to avoid riparian habitat wherever possible.

36 Given that the Preferred Alternative, especially the Preferred Alternative with east option, would
37 be co-located along existing transportation corridors to a greater extent than the Recommended
38 Alternative, it would have the least potential direct impact on habitat for Species of Economic
39 and Recreational Importance, and likely would cause a smaller increase in wildlife mortality.

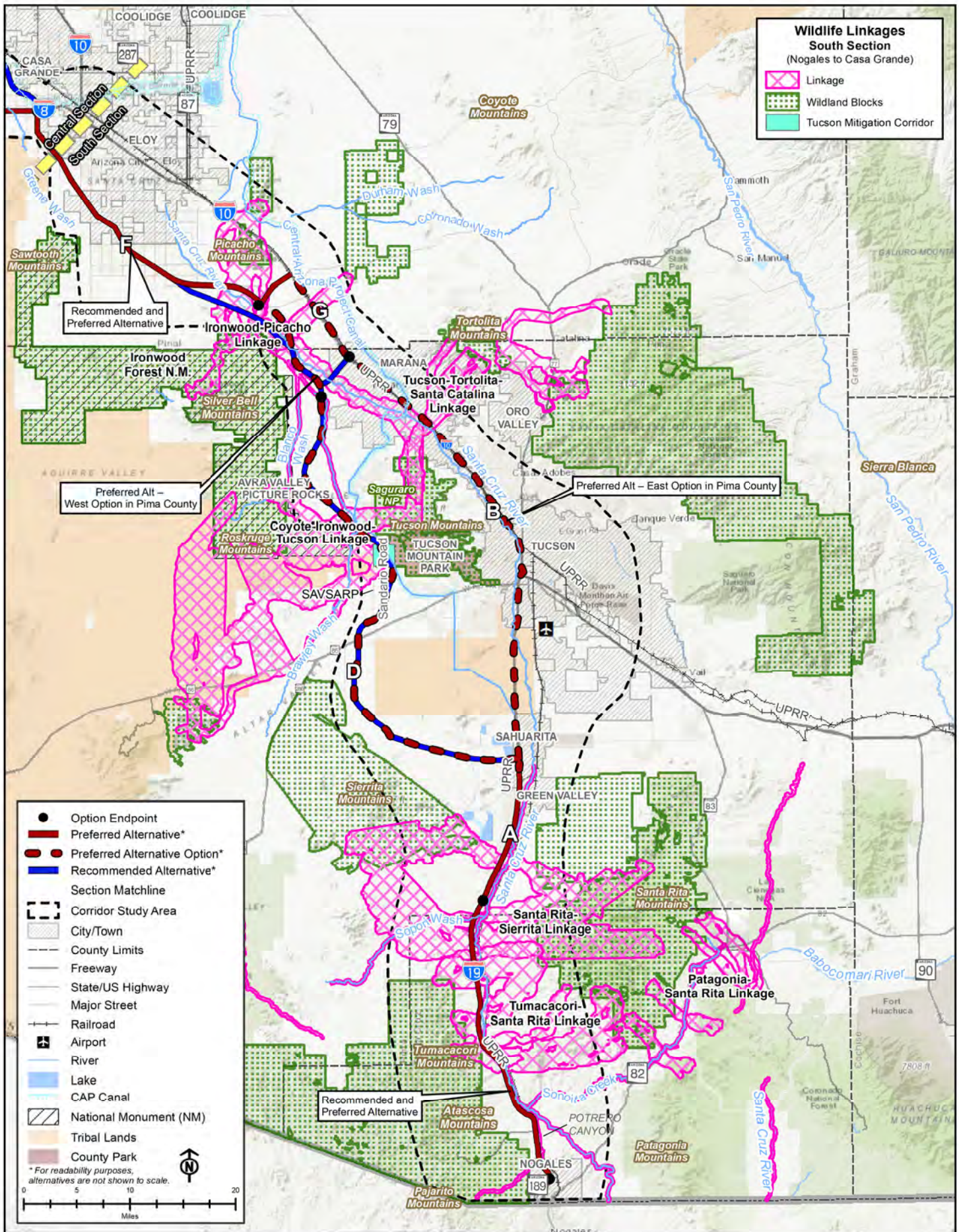


Figure 3.14-5. Wildlife Linkages in the South Section

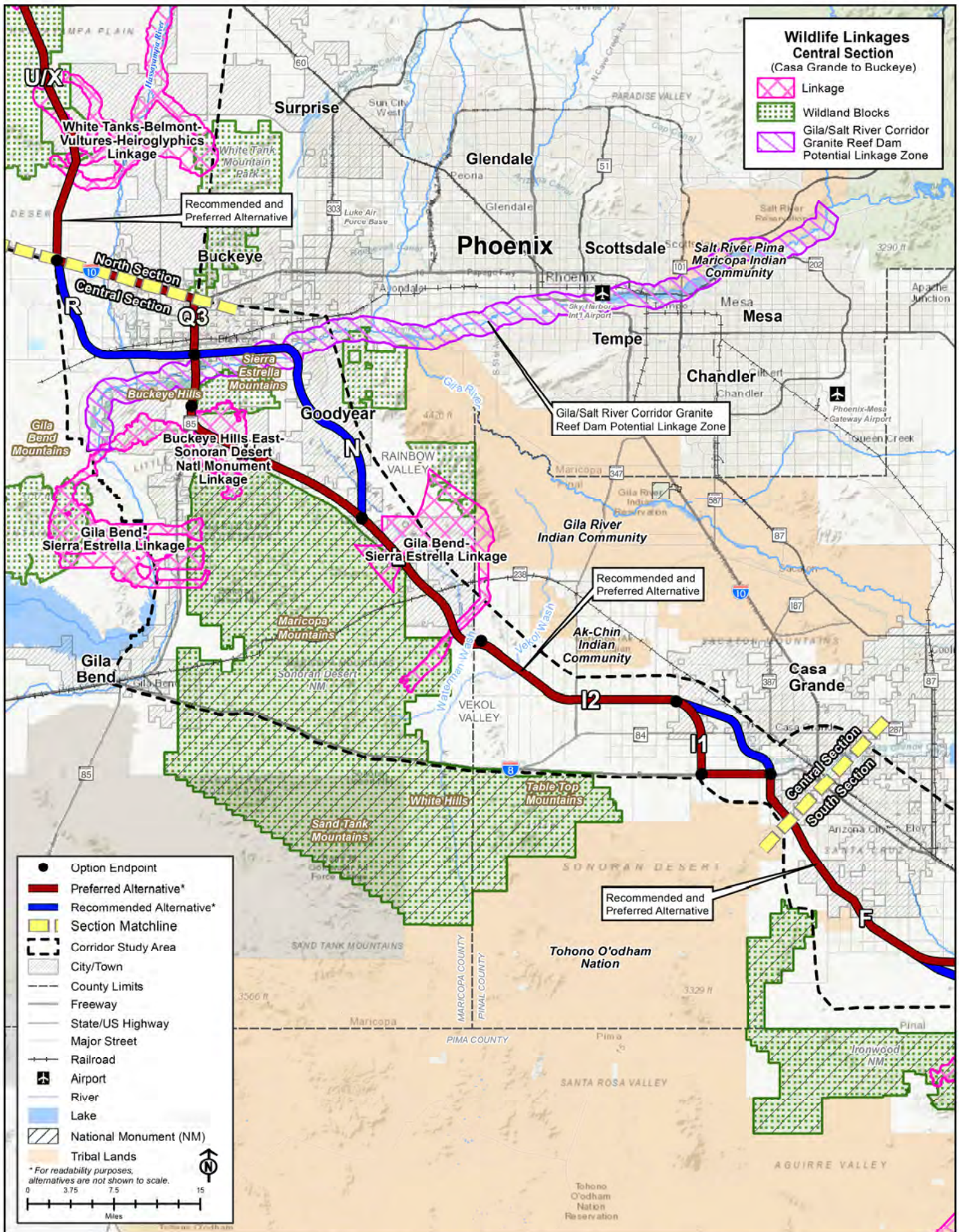


Figure 3.14-6. Wildlife Linkages in the Central Section

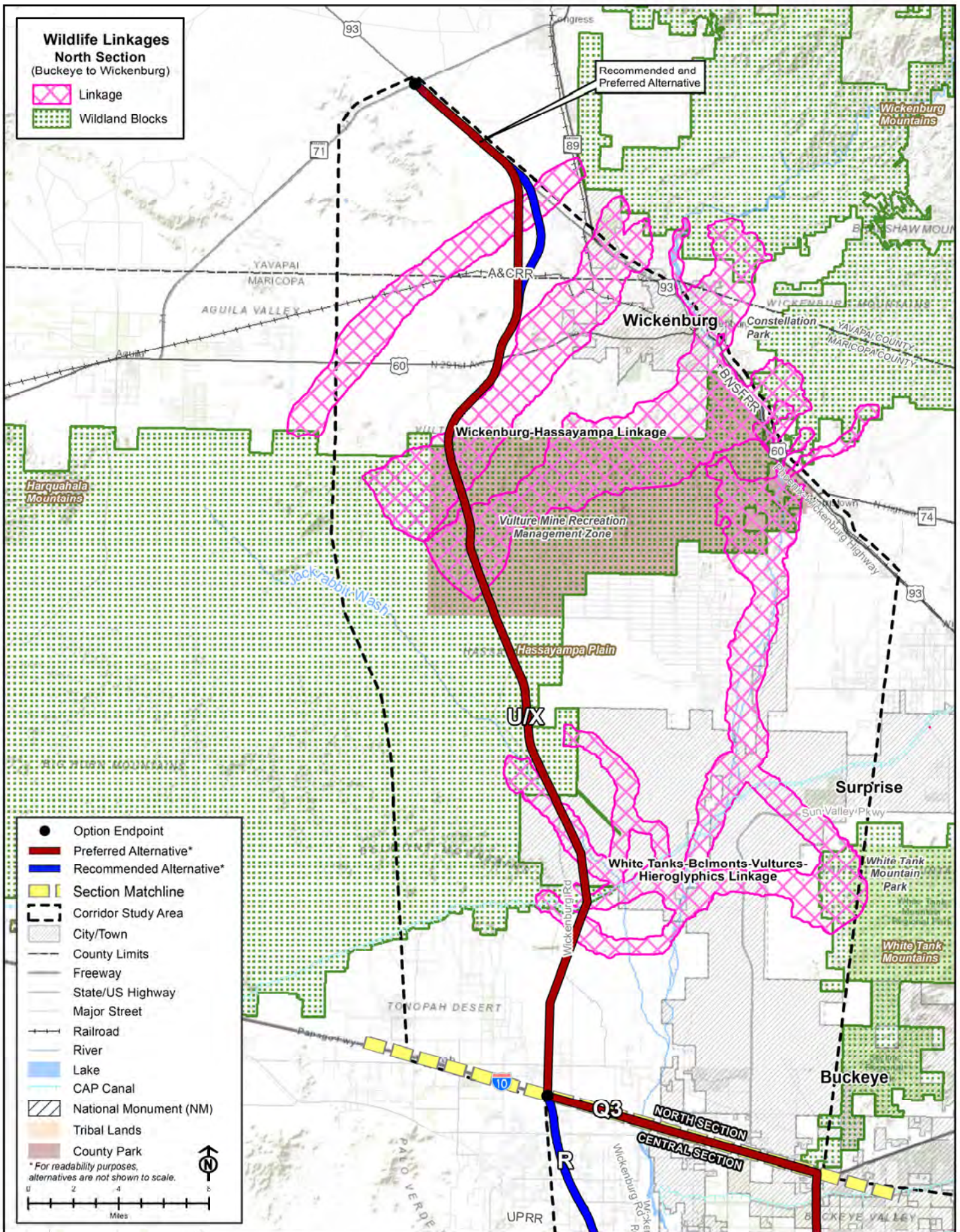


Figure 3.14-7. Wildlife Linkages in the North Section



1 For both the Recommended and Preferred Alternatives, invasive and noxious species could
2 begin colonizing new road right-of-way and surrounding habitat in areas of urban development
3 where they are well established, such as Nogales, Tucson, Casa Grande, and Buckeye. The
4 Recommended and Preferred Alternatives would have a similar likelihood of introducing
5 invasive and noxious species in the area from Buckeye to Wickenburg, which is relatively
6 undeveloped and therefore supports minimal amounts of invasive and noxious species.

7 **3.14.5.2 Special Status Species**

8 The Preferred Alternative could impact ESA-protected species and sensitive habitats associated
9 with the Santa Cruz River where the Preferred Alternative occurs along the existing I-19
10 alignment. The Preferred Alternative would have fewer potential impacts to ESA-protected
11 species near Marana, where it parallels the Santa Cruz River, than the Recommended
12 Alternative. Co-locating I-19 and I-11 could impact ESA species by increasing air, noise, and
13 light pollution, which would further degrade habitat quality and add stress to species' biological
14 life cycles, which include breeding, feeding, and resting periods. Unlike the Recommended
15 Alternative, the Preferred Alternative, with either option, would span the Gila River at an existing
16 SR 85 bridge crossing as opposed to spanning the river at a new roadway crossing. Thus, the
17 Preferred Alternative would have fewer impacts to ESA species and their habitat along the Gila
18 River. By avoiding a new crossing of the river, the Preferred Alternative would avoid the loss of
19 croplands near the river and the loss of irrigation water runoff into the Gila River, which is an
20 important source of water that sustains riparian and marsh habitat.

21 The Preferred Alternative would also cross BLM-designated habitat and USFWS-defined
22 predicted High Value Potential Habitat for Sonoran desert tortoise (USFWS 2015a). The
23 Preferred Alternative would also cross Mexican wolf and Sonoran pronghorn USFWS 10(j)
24 Experimental Populations/Reintroduction Areas. The Preferred Alternative would cross BLM-
25 designated Sonoran desert tortoise habitat south of the Gila River that would not be crossed by
26 the Recommended Alternative, but a portion of I-11 would be co-located with SR 85 at this
27 location.

28 The Preferred Alternative with west option would have similar potential impacts to Semidesert
29 Grassland within the Sonoran Desert compared to the Recommended Alternative, and may also
30 require substantial compensatory mitigation due to the likely presence of Pima pineapple cactus
31 and its habitat within this biotic community. Destruction of grassland habitat for construction of
32 the Preferred Alternative would be a permanent impact to grassland plant species, including
33 Pima pineapple cactus, within the anticipated 400-foot roadway footprint. Dispersal of invasive
34 and noxious weeds into Semidesert Grassland following construction of the Preferred
35 Alternative would negatively impact protected species such as Pima pineapple cactus and
36 Sonoran desert tortoise due to competition and altered fire regimes (USFWS 2015a). Compared
37 to the other Build Corridor Alternatives, the Preferred Alternative with east option would have
38 the smallest potential impacts to Pima pineapple cactus as it is co-located with I-19 through
39 suitable habitat.

40 The *City of Tucson Habitat Conservation Plan* (City of Tucson 2018), as well as Pima County's
41 *Sonoran Desert Conservation Plan* (Pima County 2016b), and Pima County's Conservation
42 Lands System, would be affected by the Preferred Alternative with either option. However, the
43 Preferred Alternative with west option would have significantly greater impacts, because unlike
44 the Preferred Alternative with east option, it is not co-located with any existing roadways.



1 Critical habitat for several species occurs within the Preferred Alternative, including critical
2 habitat and proposed critical habitat associated with the Santa Cruz River, for the southwestern
3 willow flycatcher and western yellow-billed cuckoo, and proposed critical habitat for the yellow-
4 billed cuckoo, and habitat for the southwestern willow flycatcher and Yuma Ridgway's rail
5 associated with the Gila River.

6 The Preferred Alternative would impact other sensitive species, which include non-ESA-listed
7 species deemed sensitive by BLM, USFS, USFWS, or the counties; species protected under the
8 Bald and Golden Eagle Protection Act, AGFD Species of Greatest Conservation Need; and
9 plant species protected under the Arizona Native Plant Law (ARS 7, Section 3-901 et seq.).
10 Impacts associated with the Preferred Alternative include the potential for mortality and injury
11 from roadway/vehicle interactions, and the direct removal of potential habitats for amphibians,
12 birds, fish, invertebrates, mammals, and reptiles. Additional impacts to animal species include
13 increased habitat degradation due to the increased noise, air, and light pollution from new or
14 improved roadway facilities. The Preferred Alternative with east option would have lower
15 impacts to sensitive species than the Preferred Alternative with west option because the
16 Preferred Alternative with east option co-occurs with existing roadways, whereas the Preferred
17 Alternative with west option mainly occurs in the mostly undeveloped area west of the Tucson
18 Mountains.

19 The Preferred Alternative, especially with the west option, would increase accessibility into
20 adjacent lands in Pima, Pinal, and Maricopa Counties and may increase accessibility to wildlife
21 refuges and Important Bird Areas used by migratory birds and other sensitive wildlife. However,
22 this increase in accessibility would be smaller than that created by the Recommended
23 Alternative, which parallels the Santa Cruz River and the Gila River to a greater extent than the
24 Preferred Alternative.

25 **3.14.5.3 Wildlife Connectivity**

26 The Preferred Alternative would directly fragment AGFD Large Intact Blocks by introducing a
27 new linear facility where a roadway does not currently exist. In addition to fragmentation, habitat
28 degradation would occur within Large Intact Block portions adjacent to the Preferred Alternative
29 due to increased disturbances such as noise and light pollution, and the spread of invasive
30 species. The Preferred Alternative would fragment the same Large Intact Block Clusters as the
31 Recommended Alternative. However, the amount of fragmentation would be significantly
32 smaller with the Preferred Alternative with east option, which would fragment 8 Large Intact
33 Blocks, compared to the Preferred Alternative with west option and the Recommended
34 Alternative, which would each fragment 13 Large Intact Blocks.

35 Following construction of the Preferred Alternative, the total surface area represented by Large
36 Intact Block fragments that no longer fulfill the AGFD 5,000-hectare threshold under which a
37 habitat block is no longer considered functional in terms of wildlife connectivity would amount to
38 8,368 and 3,550 hectares for the west option and east option, respectively. This amount would
39 be significantly smaller than the 13,072 hectares for the Recommended Alternative, with either
40 option, and in particular for the east option, which has a greater degree of co-location with
41 existing corridors. Thus, the Preferred Alternative with east option and the Recommended
42 Alternative would generate the smallest and largest loss of Large Intact Blocks, respectively.

43 The Preferred Alternative would create new infrastructure and therefore affect habitat quality
44 and add impediments to wildlife movement in the following wildlife connectivity features:



- 1 • Coyote-Ironwood-Tucson Detailed Linkage (impacted by the Preferred Alternative with west
2 option in Pima County only)
- 3 • Ironwood-Picacho Linkage
- 4 • Tucson Mitigation Corridor (impacted by the Preferred Alternative with west option in Pima
5 County only)
- 6 • Gila Bend-Sierra Estrella Linkage
- 7 • Buckeye Hills East-Sonoran Desert National Monument Linkage
- 8 • White Tank-Belmont-Hieroglyphic Mountains Linkage
- 9 • Wickenburg-Hassayampa Linkage
- 10 • Several BLM Wildlife Movement Corridors
- 11 • Pima County Buffer Overlay Zone (impacted by the Preferred Alternative with west option in
12 Pima County only)
- 13 • Brawley Wash/Black Wash Pima County Wildlife Linkage (impacted by the Preferred
14 Alternative with west option in Pima County only)

15 Unlike the Recommended Alternative and the Preferred Alternative with west option, the
16 Preferred Alternative with east option would have no impact on the Tucson Mitigation Corridor.

17 The Preferred Alternative would contribute to the isolation of Large Intact Blocks where it is co-
18 located with existing high-traffic highways (greater than 5,000 annual average daily traffic), and
19 where widening would be needed. However, in these roadway segments, the potential exists to
20 improve wildlife connectivity by implementing wildlife crossing mitigation during the process of
21 upgrading these highways to the proposed I-11. Thus, wildlife movement through the following
22 linkages could potentially be improved:

- 23 • Santa Rita-Tumacácori Linkage
- 24 • Santa Rita-Sierrita Detailed Linkage
- 25 • Tucson-Tortolita-Santa Catalina Linkage (impacted by the Preferred Alternative with east
26 option only, where it would be co-located with the existing I-10)
- 27 • Gila/Salt River Corridor Granite Reef Dam Potential Linkage Zone

28 **3.14.6 Mitigation and Tier 2 Analysis**

29 **3.14.6.1 Tier 2 Analysis Commitments**

30 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
31 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform



- 1 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
2 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
3 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate impacts to biological
4 resources. Specifically, ADOT commits to carrying out the following analysis during the Tier 2
5 process:
- 6 • **T2-Biological Resources-1:** Continue to work with AGFD to determine compensation for
7 the loss of wildlife habitat. Also continue to work with agencies prior to and during the Tier 2
8 process to conduct surveys needed to identify occupied habitat for ESA-listed species at the
9 time of the Tier 2 project and to develop specific conservation measures to avoid, minimize,
10 or mitigate impacts to listed species.
 - 11 • **T2-Biological Resources-2:** Continue to work with federal and state agencies as well as
12 affected municipalities during the Tier 2 process to evaluate potential impacts to other
13 sensitive species listed by these entities. Work with tribes during the Tier 2 process to avoid
14 or minimize effects to tribal sensitive species.
 - 15 • **T2-Biological Resources-3:** Continue to work with AGFD and other stakeholders and
16 partners prior to and during the Tier 2 process to develop and fund appropriate studies to
17 evaluate wildlife movement and roadway mortality. Sufficient time (at least 2 to 4 years) will
18 be given to ensure the studies acquire adequate data for guiding the development of
19 mitigation measures. Tier 2 impact analyses will focus on refining information relating to
20 specific impact areas within known wildlife linkages and corridors identified now and in the
21 future.
 - 22 • **T2-Biological Resources-4:** Conduct tracking studies using camera traps, satellite
23 telemetry, track plates, or other methods to identify spatial and temporal use patterns of
24 target species within the Study Area. These tracking studies, as well as collision studies, will
25 be utilized to identify sites where overpasses or underpasses could be installed. ADOT will
26 implement on-the-ground mitigation based on recommendations generated by these
27 studies, such as constructing wildlife crossings where previous crossings by wildlife have
28 been documented and building culverts of a specific size and design for wildlife occurring in
29 specific locations in the Study Area. Also existing culverts, bridges, and other roadway
30 features that are in place along co-located highways will be monitored to identify the species
31 that use these and the degree to which these existing features are effective at maintaining
32 movement across the highway barriers.
 - 33 • **T2-Biological Resources-5:** Prepare biological evaluation for the Tier 2 studies and
34 negotiate compensatory mitigation with USFWS if impacts to ESA-listed species or habitat
35 are determined likely to occur.
 - 36 • **T2-Biological Resources-6:** Analyze impacts from the Preferred Alternative with west
37 option to Pima County Conservation Lands System lands and coordinate with Pima County
38 to minimize potential impacts and identify appropriate mitigation strategies.
 - 39 • **T2-Biological Resources-7:** Partner with state and federal agencies during the Tier 2
40 design process and use data obtained from habitat suitability studies to inform design
41 features to minimize impacts to the Sonoran desert tortoise and its habitat.



- 1 • **T2-BiologicalResources-8:** Continue to work with federal and state agencies as well as
2 affected municipalities during the Tier 2 process to evaluate potential impacts to other
3 wildlife corridors designated by these entities and not evaluated in detail in this Tier 1 EIS.

4 **3.14.6.2 Mitigation Commitments**

5 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
6 impacts to biological resources from the Project (generally referred to as mitigation measures)
7 during this Tier 1 process. Specific mitigation that ADOT is committing to implement if a Build
8 Alternative is selected includes:

- 9 • **MM-BiologicalResources-1:** Participate, support, and commit to long-term invasive and
10 noxious weed management efforts in the I-11 corridor. To effectively combat noxious and
11 invasive weeds, a coordinated effort across federal, state, and local levels is required.
12 Noxious and invasive weed control on BLM or USFS lands would occur in accordance with
13 previously approved environmental assessments. Long-term management of invasive and
14 noxious weeds would be necessary to minimize indirect and cumulative effects to the Pima
15 pineapple cactus and its habitat.
- 16 • **MM-BiologicalResources-2:** Notify the Arizona Department of Agriculture prior to the start
17 of construction, if needed, to compensate for impacts to native plants.
- 18 • **MM-BiologicalResources-3:** Discuss the need for habitat compensation with AGFD during
19 the Tier 2 process. Arizona Game and Fish Commission Policy A1.9 and Department Policy
20 12.3 (AGFD 1994) state the Department shall seek compensation at a 100 percent level,
21 when feasible, for actual or potential habitat losses resulting from land and water projects.
- 22 • **MM-BiologicalResources-4:** Coordinate with AGFD and relevant agencies and
23 stakeholders to determine wildlife connectivity data needs and study design. ADOT will then
24 fund and facilitate implementation of identified studies prior to the initiation of the Tier 2
25 process, due to the timeline required (likely 2 to 4 years) to collect and analyze sufficient
26 data before draft design plans begin to limit the mitigation measures possible. ADOT and
27 the stakeholders will identify the crossing structures, design features, and supporting
28 mitigation measure or conservation necessary to facilitate the movement of wildlife through
29 the roadway barrier and will incorporate the solutions into subsequent I-11 projects.
- 30 • **MM-BiologicalResources-5:** Establish partnering opportunities with key landowners (e.g.,
31 private, BLM, Bureau of Reclamation, Maricopa County, Pinal County, Pima County, and
32 Santa Cruz County) and appropriate municipal, county, state, and federal agencies prior to
33 and during the Tier 2 process for long-term planning strategies.
- 34 • **MM-BiologicalResources-6:** Evaluate the Wildlife Connectivity Assessment reports from
35 Pima, Pinal, Maricopa, Santa Cruz, and Yavapai Counties to identify and, if possible, avoid
36 I-11 impacts on the diffuse, landscape, and riparian wildlife movement areas identified in
37 each report prior to the Tier 2 analysis.
- 38 • **MM-BiologicalResources-7:** Evaluate structures designed to enhance wildlife connectivity,
39 such as wildlife overpasses and underpasses, and fencing to funnel wildlife to these
40 structures in association with AGFD and relevant agencies and stakeholders.



- 1 • **MM-BiologicalResources-8:** Avoid or minimize impacts to designated or proposed critical
2 habitat. If impacts to critical habitat cannot be avoided, consultation with USFWS will occur
3 during the Tier 2 analysis.
- 4 • **MM-BiologicalResources-9:** Conduct a thorough habitat assessment in all areas that have
5 potential habitat for ESA-listed species for the section being studied prior to the Tier 2
6 process. If suitable habitat occurs within the construction footprint, ADOT will avoid or
7 minimize impacts. Additionally, pre-construction surveys will be completed for all ESA-listed
8 species, or it will be assumed that the species occurs on-site. For the southwestern willow
9 flycatcher, western yellow-billed cuckoo, and Yuma Ridgway's rail, 2 years of breeding
10 season surveys will be conducted prior to the Tier 2 process.
- 11 • **MM-BiologicalResources-10:** Continue to honor commitments within the Candidate
12 Conservation Agreement for the Sonoran desert tortoise in Arizona (USFWS 2015a).
- 13 • **MM-BiologicalResources-11:** Conduct habitat suitability surveys within agency-mapped
14 tortoise habitat that may be impacted by the I-11 section being considered prior to the Tier 2
15 process.
- 16 • **MM-BiologicalResources-12:** Follow ADOT's existing mitigation strategies for any future
17 I-11 segments selected for construction that are located within Sonoran desert tortoise
18 habitat. ADOT has developed comprehensive Sonoran desert tortoise mitigation that
19 includes, but is not limited to, education of contractors and ADOT staff on tortoise
20 awareness, pre-construction surveys, relocation of tortoises, on-site monitoring of
21 construction activities, and best management practices designed to reduce potential tortoise
22 mortalities during construction.

23 In addition to the general strategies, more specific mitigation strategies for resources in each
24 corridor option are identified below. Only the mitigation strategies that pertain to the Selected
25 Alternative will be included in the Final Tier 1 EIS Record of Decision. These strategies would
26 be refined during the Tier 2 process.

27 **I-19: Nogales to Sahuarita**

- 28 • **MM-BiologicalResources-13:** Avoid widening I-19 to the east along the Santa Cruz River
29 and impacting southwestern willow flycatcher, yellow-billed cuckoo, and their critical habitat;
30 Gila topminnow; and Northern Mexican garter snake habitat; conduct pre-construction
31 surveys where appropriate; and consult with USFWS, as needed (Option A).
- 32 • **MM-BiologicalResources-14:** Minimize the construction footprint to the extent possible and
33 improve or construct wildlife crossings that jaguar and ocelots will use (Option A).
- 34 • **MM-BiologicalResources-15:** Avoid or minimize construction footprint through quality Pima
35 pineapple cactus habitat, survey suitable habitat 1 year prior to the Tier 2 process to inform
36 design; implement long-term control of invasive and noxious weeds; and negotiate
37 compensatory mitigation with USFWS, as needed (Option A).
- 38 • **MM-BiologicalResources-16:** Avoid or minimize impacts to the riparian corridor associated
39 with the Santa Cruz River. The need for potential additional wildlife crossings would be
40 assessed and implemented where warranted to preserve wildlife movement. Coordinate



1 with relevant agencies to implement modifications that will enhance wildlife movement
2 (Option A).

- 3 • **MM-BiologicalResources-17:** Avoid or minimize impacts to the Santa Rita-Tumacácori
4 Linkage and Santa Rita-Sierrita Detailed Linkage. Assess whether recommendations
5 provided in the specific or county linkage reports can be used to improve or construct wildlife
6 crossings in these linkages. Coordinate with relevant agencies to implement modifications
7 that will enhance wildlife movement (Option A).

8 Sahuarita to Marana

- 9 • **MM-BiologicalResources-18:** Conduct 2 years of pre-construction surveys during the
10 breeding season in suitable habitat for yellow-billed cuckoo; implement seasonal
11 restrictions; and consult with USFWS, as needed (Option B or Preferred Alternative with
12 east option). Avoid widening I-19 or I-10 into the Santa Cruz River floodplain.

- 13 • **MM-BiologicalResources-19:** If the Preferred Alternative with east option is selected during
14 Tier 2 studies, avoid or minimize impacts to the Santa Rita-Sierrita Detailed Linkage,
15 Tucson-Tortolita-Santa Catalina Linkage, and Coyote-Ironwood-Tucson Detailed Linkage.
16 Assess whether recommendations provided in the specific or county linkage reports can be
17 used to improve and construct wildlife crossings in these linkages. Coordinate with relevant
18 agencies to implement modifications that will enhance wildlife movement (Option B or
19 Preferred Alternative with east option).

- 20 • **MM-BiologicalResources-20:** Avoid or minimize construction footprint through quality Pima
21 pineapple cactus habitat; survey suitable habitat 1 year prior to the Tier 2 process to inform
22 design; implement long-term control of invasive and noxious weeds; and negotiate
23 compensatory mitigation with USFWS, as needed.

- 24 • **MM-BiologicalResources-21:** Avoid critical and occupied habitat for the Chiricahua leopard
25 frog that occurs adjacent to the southern end of this option (Options C, D, CAP Option, I-10
26 Connector).

- 27 • **MM-BiologicalResources-22:** Avoid or minimize impacts to the Santa Rita-Sierrita Detailed
28 Linkage, Coyote-Ironwood-Tucson Detailed Linkage. Assess whether recommendations
29 provided in the linkage-specific or county linkage reports can be used to improve and
30 construct wildlife crossings in these linkages. Coordinate with relevant agencies to
31 implement modifications that will enhance wildlife movement (Options C, D, CAP Option,
32 I-10 Connector).

- 33 • **MM-BiologicalResources-23:** If the Preferred Alternative with west option is chosen during
34 Tier 2, studies will be developed to avoid, minimize, or mitigate impacts to the Tucson
35 Mitigation Corridor, including coordination with Bureau of Reclamation, AGFD, and other
36 relevant agencies to improve and design wildlife crossings in and near the Tucson Mitigation
37 Corridor. Specific mitigation related to the Tucson Mitigation Corridor includes (1) relocating
38 and reclaiming Sandario Road; (2) conducting wildlife studies prior to the Tier 2 process;
39 (3) aligning I-11 wildlife crossing structures to match the existing CAP canal siphons (seven
40 crossings total); (4) creating additional wildlife crossing(s) near the Tucson Mitigation
41 Corridor depending on the results of wildlife studies; (5) acquiring property (at a minimum
42 1:1 ratio) to support additional wildlife connectivity corridors between the Tucson Mountains



1 and the Roskrige and Silver Bell Mountains for the number of acres of the Tucson
2 Mitigation Corridor that will be impacted by the project; and (6) implementing design
3 restrictions, such as no interchanges in the Tucson Mitigation Corridor or between Snyder
4 Hill Road and Manville Road, and minimizing the width of I-11, to limit the I-11 footprint in
5 the Tucson Mitigation Corridor area.

6 **Marana to Casa Grande**

- 7 • **MM-BiologicalResources-24:** Avoid or minimize impacts to the Santa Cruz River along this
8 option; conduct 2 years of pre-construction breeding season surveys for yellow-billed
9 cuckoo; implement seasonal restrictions; and consult with USFWS, as needed (Option F).
- 10 • **MM-BiologicalResources-25:** Avoid or minimize impacts to the Coyote-Ironwood-Tucson
11 Detailed Linkage, Ironwood-Picacho Linkage. Assess whether recommendations provided in
12 the linkage-specific or county linkage reports can be used to improve and construct wildlife
13 crossings in these linkages. Coordinate with relevant agencies to implement modifications
14 that will enhance wildlife movement (Option F).
- 15 • **MM-BiologicalResources-26:** Avoid or minimize impacts to the Ironwood-Picacho Linkage.
16 Assess whether recommendations provided in the linkage-specific or county linkage reports
17 can be used to improve and construct wildlife crossings in these linkages. Coordinate with
18 relevant agencies to implement modifications that will enhance wildlife movement (Option G,
19 not applicable to the Preferred Alternative).

20 **Casa Grande to Buckeye**

- 21 • **MM-BiologicalResources-27:** Avoid or minimize impacts to the Gila Bend-Sierra Estrella
22 Linkage. Assess whether recommendations provided in the linkage-specific or county
23 linkage reports can be used to improve and construct wildlife crossings in these linkages.
24 Coordinate with relevant agencies to implement modifications that will enhance wildlife
25 movement (Options K and L).
- 26 • **MM-BiologicalResources-28:** Avoid or minimize impacts to the Buckeye Hills East-
27 Sonoran Desert National Monument Linkage. Assess whether recommendations provided in
28 the linkage-specific or county linkage reports can be used to improve and construct wildlife
29 crossings in these linkages. Coordinate with relevant agencies to implement modifications
30 that will enhance wildlife movement (Option M).
- 31 • **MM-BiologicalResources-29:** Minimize the footprint of the bridge crossing the Gila River to
32 the extent possible; conduct 2 years of pre-construction breeding season surveys for yellow-
33 billed cuckoo, southwestern willow flycatcher, and Yuma Ridgway's rail suitable habitat;
34 implement seasonal restrictions; and consult with USFWS, as needed (Option N, not
35 applicable to the Preferred Alternative).
- 36 • **MM-BiologicalResources-30:** Avoid or minimize impacts to the Gila River riparian corridor.
37 The need for potential additional wildlife crossings will be assessed to preserve wildlife
38 movement, Coordination with relevant agencies would occur to implement modifications that
39 will enhance wildlife movement (Option N, not applicable to the Preferred Alternative).



- 1 • **MM-BiologicalResources-31:** Avoid or minimize impacts to the Gila Bend-Sierra Estrella
2 Linkage. Assess whether recommendations provided in the linkage-specific or county
3 linkage reports can be used to improve and construct wildlife crossings in these linkages.
4 Coordinate with relevant agencies to implement modifications that will enhance wildlife
5 movement (Option Q1, not applicable to the Preferred Alternative).
- 6 • **MM-BiologicalResources-32:** Minimize the footprint of bridge widening or new bridge
7 construction on the SR 85 crossing the Gila River to the extent possible; conduct two years
8 of pre-construction, breeding season surveys in suitable habitat for yellow-billed cuckoo,
9 southwestern willow flycatcher, and Yuma Ridgway's rail; implement seasonal restrictions;
10 and consult with USFWS, if species present, as needed (Option Q2).
- 11 • **MM-BiologicalResources-33:** Avoid or minimize impacts to the Gila River riparian corridor.
12 The need for potential additional wildlife crossings will be assessed to preserve wildlife
13 movement. Coordinate with relevant agencies to implement modifications that will enhance
14 wildlife movement (Option Q2).
- 15 • **MM-BiologicalResources-34:** Minimize construction in the Gila River floodplain to the
16 extent possible; conduct 2 years of pre-construction, breeding season surveys in suitable
17 habitat for yellow-billed cuckoo; implement seasonal restrictions; and consult with USFWS, if
18 species present, as needed (Options Q3 and R).

19 **Buckeye to Wickenburg**

- 20 • **MM-BiologicalResources-35:** Avoid, minimize, and mitigate impacts to the White Tank-
21 Belmont Hieroglyphics Linkage, Wickenburg-Hassayampa Linkage and primary and
22 secondary wildlife crossing structures on Reclamation's CAP canal. Assess whether
23 recommendations provided in the linkage-specific or county linkage reports can be used to
24 improve and construct wildlife crossings in these linkages. Coordinate with relevant
25 agencies to implement modifications that will enhance wildlife movement (Options S, U, and
26 X).

27 **3.14.6.3 Additional Mitigation to be Evaluated in Tier 2**

28 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
29 above, to include best practices, permit requirements, and/or other mitigation strategies
30 suggested by agencies or the public. Examples of measures that ADOT may evaluate in Tier 2
31 include:

- 32 • Wash construction equipment free of attached plant/vegetation and soil/mud debris prior to
33 entering/leaving construction sites to avoid the introduction of invasive and noxious species
34 seeds and to avoid invasive and noxious species seeds from entering or leaving sites.
- 35 • Seed disturbed soils that are not paved and that will not be landscaped or otherwise
36 permanently stabilized by construction with species native to the project vicinity.
- 37 • Determine potential mitigation measures to avoid or minimize impacts to ESA-listed species
38 though consultation with USFWS during the Tier 2 process. These could include breeding
39 season restrictions, translocation of individuals, minimization of vegetation removal,
40 minimization of the project footprint, etc.



1 **3.15 Temporary Construction-related Impacts**

2 **3.15.1 Summary of Draft Tier 1 EIS**

3 The Build Corridor Alternatives would result in temporary construction-related impacts, with the
4 most consequential impacts occurring where new roadway would be constructed in
5 undeveloped areas. Temporary construction impacts would include, but are not limited to:

- 6 • Increased traffic congestion and travel times through construction areas, which may change
7 traffic patterns on local roads or increase emergency response times for fire, police, and
8 ambulance services
- 9 • Reduced access for businesses near the construction zones
- 10 • Fugitive dust and mobile source emissions
- 11 • Increased sedimentation from erosion during stormwater runoff
- 12 • Risk of hazardous material spills into adjacent streams or rivers
- 13 • Noise and vibration from activities such as pile driving for bridge structures, which could
14 impact residences and businesses or wildlife movement and nesting for bird species
- 15 • Removal of vegetation, including protected plant species
- 16 • Impacts to wildlife species, especially less mobile species, such as the Sonoran Desert
17 tortoise, or ground nesting species such as the burrowing owl

18 **3.15.2 Summary of Changes Since Draft Tier 1 EIS**

19 Commenters on the Draft Tier 1 EIS expressed concern for impacts to air quality and health,
20 wildlife, and other resources. These impacts are analyzed and discussed in **Section 3.10** (Air
21 Quality) and **Section 3.14** (Biological Resources). No changes to **Section 3.15** resulted from
22 comments.

23 **3.15.3 No Build Alternative**

24 The No Build Alternative would not lead to I-11 construction-related activities and is therefore
25 not discussed.

26 **3.15.4 Recommended Alternative**

27 The Recommended Alternative would result in the I-11 construction-related impacts
28 summarized in **Section 3.15.1**.



1 **3.15.5 Preferred Alternative**

2 The Preferred Alternative would result in the I-11 construction-related impacts summarized in
3 **Section 3.15.1.**

4 **3.15.6 Mitigation and Tier 2 Analysis**

5 **3.15.6.1 Tier 2 Analysis Commitments**

6 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
7 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
8 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
9 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
10 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate temporary construction
11 impacts.

12 Tier 2 analysis would provide additional detail on the construction methodology if a Build
13 Corridor Alternative is selected. Additional details would be expected to include the number of
14 aerial structures (bridges or viaducts), the need for embankments and other earth-moving
15 activities, and other design details. The exact design and configuration of I-11 would be highly
16 dependent upon local conditions, and efforts would be undertaken to gather information about
17 local features as part of the Tier 2 analysis. Further, the Tier 2 analysis would address traffic
18 management and detours that may occur during the construction period. Details about
19 construction techniques, equipment, and staging areas used to minimize temporary
20 construction-related impacts also would be analyzed as part of the Tier 2 analysis.

21 **3.15.6.2 Mitigation Commitments**

22 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
23 temporary construction impacts from the Project (generally referred to as mitigation measures)
24 during this Tier 1 process.

25 Strategies to mitigate the temporary impacts from construction are identified by resource
26 throughout **Chapter 3** (Affected Environment and Environmental Consequences) and in
27 **Chapter 7** (Summary of Mitigation and Tier 2 Analysis). More specific mitigation measures
28 would be identified in the Tier 2 analysis. Once project design is more defined, temporary
29 construction impacts can be evaluated and addressed in commensurate detail.

30 **3.15.6.3 Additional Mitigation to be Evaluated in Tier 2**

31 During the Tier 2 process, ADOT will evaluate mitigation measures to include best practices,
32 permit requirements, and/or other mitigation strategies suggested by agencies or the public.



1 3.16 Irreversible and Irretrievable Commitment of Resources

2 3.16.1 Summary of Draft Tier 1 EIS

3 The Build Corridor Alternatives are expected to have an irreversible and irretrievable
4 commitment of resources in the following resource areas as a result of construction.

5 **Natural Resources.** The construction of the Project would involve irretrievable commitments of
6 natural resources such as land, including everything below the surface, and farmlands in some
7 areas (see **Section 3.12** [Geology, Soils, and Prime and Unique Farmlands]). The Purple
8 Alternative could result in irretrievable commitments of threatened and endangered species and
9 their associated habitat and wildlife connectivity (see **Section 3.14** [Biological Resources]) and
10 water resources (see **Section 3.13** [Water Resources]). In general, the commitment of
11 resources would result from the conversion of undeveloped land to developed land.

12 **Cultural and Section 4(f) Resources.** Cultural resources and Section 4(f) resources are both
13 scarce, and impacts would be an irretrievable commitment. Archaeological artifacts could be
14 preserved through curation, but the historic integrity of the site would be lost. Impacts to historic
15 sites outside of the construction area would be primarily contextual.

16 **Fossil Fuels.** Fossil fuels, such as oil and gas, consumed during project construction and the
17 operation of vehicles traveling along I-11 are not considered rare, but would be an irretrievable
18 commitment, as they are not renewable. Consumption of oil and gas would increase during
19 construction, but advances in technology may contribute to a reduction in the overall rate of
20 consumption and usage of fossil fuels in the long term.

21 **Construction Materials.** Materials used in the construction of I-11 could include Portland
22 cement concrete (concrete), asphalt concrete (asphalt), rock base course, and steel. Water
23 would be consumed for mixing concrete, washing equipment, and suppressing dust. The use of
24 these materials would be largely irretrievable; however, these resources are generally not in
25 short supply.

26 As stated in the Draft Tier 1 EIS, the Purple Alternative would require approximately 758 new
27 lane miles, requiring large amounts of undeveloped land and construction materials. However,
28 these commitments would be less than the 930 new lane miles required by the Green
29 Alternative. The Orange Alternative is located along more existing corridors than the Purple and
30 Green Alternatives and would require the least amount of undeveloped land and construction
31 materials with approximately 415 new lane miles. It would cause the least disruption to nearby
32 natural resources due to its being largely co-located with existing transportation facilities.

33 3.16.2 Summary of Changes Since Draft Tier 1 EIS

34 Commenters on the Draft Tier 1 EIS expressed concern for irreversible and irretrievable
35 commitments of wildernesses. These impacts were discussed in the Draft Tier 1 EIS. No
36 changes to this section resulted from comments.



1 **3.16.3 No Build Alternative**

2 Under the No Build Alternative, I-11 would not be built; and new commitments of resources
3 would not occur beyond those that would occur in relation to other programmed projects and the
4 maintenance of existing facilities. Existing conditions and baseline trends would continue.

5 **3.16.4 Recommended Alternative**

6 The Recommended Alternative is expected to have irreversible and irretrievable commitment of
7 resources in several resource areas if constructed, similar to those of Build Corridor Alternatives
8 analyzed in the Draft Tier 1 EIS and summarized above. These include natural resources,
9 cultural and Section 4(f) resources, fossil fuels, and construction materials. Generally,
10 commitments increase as the conversion of undeveloped land to developed land increases.
11 Construction of the Recommended Alternative could potentially result in irretrievable
12 commitments of the Pima pineapple cactus and the Yuma Ridgway's rail habitat, both
13 threatened and endangered species (see **Section 3.14** [Biological Resources] of the Final Tier
14 1 EIS). The Recommended Alternative could also involve irreversible commitments of high-
15 quality wetlands in the Santa Cruz River floodplain near Marana (see **Section 3.13** [Water
16 Resources] of the Final Tier 1 EIS). The Recommended Alternative would require 917 new lane
17 miles.

18 **3.16.5 Preferred Alternative**

19 The Preferred Alternative would require 714 new lane miles with the east option in Pima County
20 and 864 new lane miles under the west option in Pima County. Construction of the west option
21 of the Preferred Alternative could potentially result in irretrievable commitments of the Pima
22 pineapple cactus habitat. The irretrievable commitment of the Yuma Ridgway's rail habitat and
23 high-quality wetlands associated with the Recommended Alternative would be avoided under
24 the Preferred Alternative. The Preferred Alternative, regardless of the option selected, would
25 require fewer materials and disrupt fewer natural resources than the Recommended Alternative.
26 The Preferred Alternative with east option in Pima County has the potential to irretrievably
27 impact the historic districts in downtown Tucson.

28 **3.16.6 Mitigation and Tier 2 Analysis**

29 **3.16.6.1 Tier 2 Analysis Commitments**

30 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
31 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
32 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
33 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
34 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate impacts.

35 **3.16.6.2 Mitigation Commitments**

36 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
37 impacts from the Project (generally referred to as mitigation measures) during this Tier 1
38 process.



1 Strategies to mitigate impacts are identified by resource throughout **Chapter 3** (Affected
2 Environment and Environmental Consequences) and in **Chapter 7** (Summary of Mitigation and
3 Tier 2 Analysis). More specific mitigation measures would be identified in the Tier 2 analysis.

4 **3.16.6.3 Additional Mitigation to be Evaluated in Tier 2**

5 During the Tier 2 process, ADOT will evaluate mitigation measures to include best practices,
6 permit requirements, and/or other mitigation strategies suggested by agencies or the public.



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1 **3.17 Indirect and Cumulative Effects**

2 This section describes the potential indirect and cumulative effects from the Build Corridor
3 Alternatives in the vicinity of the I-11 Project Area. It evaluates the extent to which the No Build
4 Alternative and Build Corridor Alternatives would have indirect and cumulative effects and
5 identifies mitigation strategies to avoid or minimize these impacts.

6 While the I-11 Corridor has the potential to influence changes in land use, development, and
7 travel patterns, regulation of land use occurs at the local level. Local jurisdictions are
8 responsible for, and citizens approve, local plans that identify planned land use. Transportation
9 improvements generally follow the resulting growth that occurs from local planning. After
10 transportation infrastructure improvements are made, additional effects can occur. Therefore,
11 potential mitigation strategies proposed in the Final Tier 1 EIS are limited to those within the
12 context of this Tier 1 Study. However, the indirect impact analysis may aid local governments in
13 managing potential induced development in their jurisdictions.

14 **3.17.1 Summary of Draft Tier 1 EIS**

15 **3.17.1.1 Indirect Effects**

16 The initial step in the evaluation of indirect effects is to identify an area of influence for each
17 Build Corridor Alternative where indirect, or project-induced, effects could occur. This was
18 accomplished through the consideration of the following:

- 19 • **Where would faster travel times occur?** Faster travel times benefit freight carriers, for
20 whom costs are sensitive to travel time, and faster routes may shift the movement of freight
21 away from congested areas. Faster travel times also would benefit the traveling public
22 through improved access to employment and economic centers, which in turn may affect
23 land uses in terms of location and density. More convenient commute times to employment
24 centers can promote residential development farther from those employment centers. In
25 addition, better access to the transportation network may promote employment centers in
26 new locations.
- 27 • **Where would new access occur?** Interchanges provide direct access to interstate
28 facilities. The locations of new interchanges generally coincide with improved accessibility,
29 thus increasing the development potential of nearby land along the corridor. Interchange
30 locations for I-11 would not be determined as part of the Tier 1 process, but rather would be
31 developed as part of more detailed alignments subject to project-level or Tier 2
32 environmental review. However, the AZTDM includes interchange assumptions based on
33 current regional transportation plan networks that would warrant connections to a new high-
34 capacity transportation facility.
- 35 • **Where would growth occur?** Improved access could induce growth. Developable areas
36 within 5 miles of existing and potential future interchanges are assumed to have project-
37 induced growth.

38 To identify the potential for indirect effects within the area of influence, the Project Team
39 completed the following steps.



- 1 1. Assessed potential for changes in transportation and land use that would result from the
2 changes in travel patterns and accessibility.
- 3 2. Reviewed resources that are present within the area of influence and considered whether
4 environmentally sensitive areas may be indirectly affected by changes in land use and
5 transportation patterns and accessibility, or related economic activity.
- 6 3. Determined whether regulatory restrictions or mitigation strategies could effectively minimize
7 or avoid the potential for indirect effects, or whether additional measures could be
8 warranted. These strategies would be used to inform the Tier 2 studies and mitigation
9 commitments made in future decision documents.

10 Under all Build Corridor Alternatives, the construction of a new transportation facility could affect
11 the type and pace of land use change in areas that are currently undeveloped or that can
12 reasonably be anticipated to experience additional development as a result of the undertaking.
13 The introduction of new access could trigger or accelerate the development of land that would
14 be better connected to employment and services; result in the development of commercial
15 services that serve long-distance travel; or promote development of new industrial,
16 manufacturing, or other businesses that value close access to high-capacity transportation.

17 In general, land around interchanges and areas with increased accessibility would be expected
18 to experience changes in uses as well as an increased rate of development compared to the No
19 Build Alternative. Employment (business park, freestanding office, industrial); commercial
20 (convenience retail/filling stations, convenience food service, community shopping centers,
21 regional shopping centers); and mid- to high-density residential type uses are likely in urban
22 locations. Warehousing/distribution, convenience retail, gas stations, and convenience food
23 service type uses are likely in rural locations. Improvements along the existing corridors would
24 not be expected to cause major changes in overall land use patterns as land uses would have
25 already developed within incorporated jurisdictions.

26 In the South Section, developable land around potential future interchange locations along the
27 Purple and Green Alternatives is mostly planned for residential use. Development here is limited
28 by the presence of national and local parks, national monuments, and tribal land, as well as
29 Tucson Water's CAVSARP and SAVSARP facilities.

30 In the Central Section, although the Purple and Green Alternative in this part of the corridor
31 could attract trips away from the existing network, large parts of the area are not subject to
32 development, including the Sonoran Desert National Monument and protected areas along the
33 Gila River. Locations along the I-11 Corridor within incorporated jurisdictions such as Casa
34 Grande, Goodyear, and Buckeye are more likely to experience land use change compared to
35 others, based on access to existing utilities/services (water, sanitary sewer storm drainage
36 private utilities).

37 All the Build Corridor Alternatives in the North Section would provide direct mobility benefits by
38 improving access to an area that is planned for development by local jurisdictions, improving
39 travel times by providing a more direct and continuous high-capacity route through this area.

40 Changes in land use could alter air quality, noise patterns, and visual characteristics, and could
41 affect historic properties, archaeological sites, or traditional cultural properties throughout the
42 corridor. These changes may also affect recreational uses. This could potentially lead to a



1 decrease in economic contributions from outdoor enthusiasts being deterred by changes in rural
2 character or an increase in outdoor recreation due to improved access. Induced development
3 could also introduce or exacerbate the introduction of invasive species, alter habitat
4 characteristics, and contribute to the overall loss of habitat, causing gradual changes in species
5 composition, diversity, genetic makeup, overall species health, and mating patterns. The indirect
6 impacts would be intensified in areas with new transportation corridors where there is no
7 existing facility.

8 3.17.1.2 Cumulative Effects

9 To assess the potential for cumulative effects, the Project Team completed the following steps.

- 10 1. Established a temporal scope for the cumulative impact assessment. The timeframe
11 established for the cumulative impact analysis extends between 1950 and 2040 to
12 correspond with adopted demographic data utilized in the AZTDM. The year of 1950 was
13 the beginning of the interstate era with the construction of I-10 starting in 1956. The year
14 1950 captures the travel and development patterns associated with the construction of the
15 interstate system in Arizona.
- 16 2. Established a geographic scope for the cumulative impact assessment. The geographic
17 Cumulative Effects Study Area varies by resource and is as large as the area of direct and
18 indirect effects. The Cumulative Effects Study Areas are established to encompass an area
19 that includes past, present, and reasonably foreseeable actions that have or may contribute
20 to the trend in the health of the resource.
- 21 3. Determined other actions – past, present, and reasonably foreseeable – and their effect on
22 each resource. Future actions were identified out to 2040 and beyond, if possible. The
23 Project Team distributed a memorandum to the Cooperating and Participating Agencies for
24 comment containing the assumptions for future projects and activities to consider in the I-11
25 Study Area (FHWA 2018). Past, present, and reasonably foreseeable future actions are
26 detailed in **Table 3.17-1** and **Table 3.17-2** of the Draft Tier 1 EIS.

27 3.17.2 Summary of Changes Since Draft Tier 1 EIS

28 Agency and public feedback on indirect and cumulative impacts focused on edits and additions
29 to the list of reasonably foreseeable future actions (**Table 3.17-1**). The following changes or
30 additions respond to these comments:

- 31 • References to the “Tres Rios Corridor” have been corrected to state “Tres Rios Freeway.”
- 32 • The Loop 202 South Mountain Freeway was complete in December 2019, so the action was
33 moved from the list of reasonably foreseeable future actions to the summary of past and
34 present actions.
- 35 • References to the *Sonoran Valley Parkway Record of Decision* were updated to reflect its
36 issue date of April 29, 2019 (BLM 2019).
- 37 • Planned transmission line and irrigation projects in the area were added to the list of
38 reasonably foreseeable future actions (**Table 3.17-1**).



1 **Table 3.17-1. Additions to Draft Tier 1 EIS Table 3.17-2 (Reasonably Foreseeable**
2 **Future Actions)**

Draft Tier 1 EIS #	Project Type	Project Name	Description	Location
40	Transmission Line	SunZia Southwest Transmission Project	The SunZia Project has received federal and State of Arizona permits to construct two 500 kV transmission lines and substations from the renewable resource energy zones in central New Mexico to the existing Pinal Central 500 kV Substation in central Arizona. SunZia is divided into three project segments as follows: (1) SunZia East 500 kV to SunZia South 500 kV; (2) SunZia South 500 kV to Willow 500 kV; and (3) Willow 500 kV to Pinal Central 500 kV.	Central New Mexico to central Arizona
41	Transmission Line	Tucson Electric Power (TEP) Kino to DeMoss-Petrie 138-kV Transmission Line	The Kino to DeMoss-Petrie 138-kV transmission line will connect the Kino Substation to the existing DeMoss-Petrie Substation. The line will also interconnect with the planned University of Arizona North Substation.	City of Tucson
42	Transmission Line	TEP Irvington-East Loop Transmission Line	The Irvington-East Loop 138-kV transmission line will connect the Irvington and East Loop substations, and interconnect with the planned Port and Patriot substations.	City of Tucson
43	Transmission Line	TEP Irvington to Kino 138-kV Transmission Line and Kino Substation Projects	The proposed transmission line is the first of several system improvements designed to provide additional transmission capacity in the central portion of the Tucson metro area. Phase 1 will extend approximately 4 miles from TEP's Irvington Campus to the proposed Kino Substation, which would occupy approximately 3.5 acres at the southeast corner of South Kino Parkway and East 36th Street.	City of Tucson



Draft Tier 1 EIS #	Project Type	Project Name	Description	Location
44	Transmission Line	TEP Sonoran Substation to Wilmot Energy Center 138-kV Transmission Line	The Sonoran Substation will connect TEP's existing 138-kV transmission system to the Wilmot Energy Center (WEC) and house transformers and other equipment to reduce voltage. TEP plans to build the Sonoran Substation on about 40 acres at a site located southeast of East Old Vail Connection and South Swan Roads. The Cisne Switchyard will be located within the WEC and will interconnect the new solar and battery storage systems to TEP's electrical system through the proposed 138-kV facilities. A 138-kV transmission line will extend more than a mile to connect the Cisne Switchyard to the new Sonoran Substation, and new 138-kV transmission lines will connect TEP's existing 138-kV transmission system along East Old Vail Connection Road to the Sonoran Substation. The lines will cross private land in Tucson and unincorporated Pima County.	City of Tucson
45	Transmission Line	TEP Rosemont 138-kV	The new 13-mile, 138-kV transmission line would link the proposed Toro Switchyard near Green Valley to the site of the proposed Rosemont Cooper mine in the Santa Rita Mountains southeast of Tucson. The project is contingent on mine approval.	City of Tucson
46	Irrigation	Proposed Rehabilitation: San Carlos Irrigation Project Facilities	The proposed action includes the reconstruction and lining of the Florence-Casa Grande Canal and the Casa Grande Canal, and the construction of cross-drainage features to convey storm water across the canal alignment and new control structures to improve operation of the rehabilitated canals. It would rehabilitate the Florence Canal, and a new canal would be constructed to connect the Florence-Casa Grande Canal with the Casa Grande Canal.	Pinal County

1 kV = Kilovolt, TEP = Tucson Electric Power



1 **3.17.3 No Build Alternative**

2 Under the No Build Alternative, land uses would continue along current trajectories, with
3 continued growth and development along existing transportation corridors as planned by local
4 jurisdictions in their mandatory General Plan updates approved by voters. Planned
5 developments are present in western Maricopa County (particularly Buckeye and Goodyear)
6 and in the Casa Grande area. The pace of development and subsequent change in land use
7 patterns would be guided by market forces and availability of public services. No indirect or
8 cumulative effects to land uses are anticipated.

9 **3.17.4 Recommended Alternative**

10 **3.17.4.1 Indirect Effects**

11 Much of the corridor is already planned as a future transportation corridor in local transportation
12 and land use plans (e.g., West Pinal Freeway, SR 303L, SR 30/Tres Rios Freeway,
13 Hassayampa Freeway) and development is planned around the corridor. The Recommended
14 Alternative may accelerate this planned growth. One exception is the Avra Valley area where
15 substantial development is not planned; development in this area could require zoning changes.
16 The Recommended Alternative could affect the type or pace of land use change in areas that
17 are currently undeveloped by expediting the rate and density of development through new and
18 improved access. Project-induced land development could increase or change the nature and
19 location of residential and commercial uses, increase traffic on local roads, increase housing
20 options and alter property values, and increase demand to public facilities and services.
21 Improved access to existing employment centers would promote development of new industrial,
22 manufacturing, or other businesses to the area that value close access to high-capacity
23 transportation, which would increase local job opportunities. Reductions in travel times would
24 allow for more efficient freight movement and business productivity, while better access would
25 support tourism and recreation opportunities.

26 Changes in land use could also alter air quality, noise patterns, and visual characteristics, and
27 could affect historic properties, archaeological sites, or traditional cultural properties. These
28 changes may also affect recreational uses. This could potentially lead to a decrease in
29 economic contributions from outdoor recreation due to urbanization or changes in rural
30 character or, on the other hand, it could lead to an increase in outdoor recreation due to
31 improved access. Induced development could also introduce or exacerbate the introduction of
32 invasive species. It could alter habitat characteristics or lead to substantial habitat loss, causing
33 gradual changes in species composition, diversity, genetic makeup, overall species health, and
34 mating patterns. The indirect impacts would be intensified in areas with new transportation
35 corridors.

36 Within incorporated jurisdictions such as Nogales, Sahuarita, Tucson, Marana, Eloy, Casa
37 Grande, Goodyear, and Buckeye, land uses have already developed along the Recommended
38 Alternative. Improvements where the Recommended Alternative is co-located with an existing
39 facility would not be expected to cause major changes in overall land use patterns; however,
40 increased access to existing utilities/services could cause adjacent areas to grow at a faster
41 pace.



1 **Figure 3.17-1** illustrates the future growth areas in the Study Area, as reflected in municipal
2 general and county comprehensive plans, and supported by interviews with local planning and
3 economic development staff (**Appendix E6** [Memorandum: Land Use and Economic
4 Development Interview Summary] of the Draft Tier 1 EIS). This figure also shows generalized
5 areas where improved accessibility and project-induced growth may occur from the
6 Recommended Alternative.

7 **3.17.4.2 Cumulative Effects**

8 The implementation of the Recommended Alternative, in combination with other past, present,
9 and reasonably foreseeable future actions, would contribute to the trend in expanding
10 development activities throughout southern and central Arizona. It would stimulate economic
11 growth in Arizona by means of an increase in supplier spending and employee spending across
12 all sectors of the economy. The implementation of multiple projects in the same region could
13 have a synergistic effect of accelerating the timing of planned developments. I-11, along with
14 other reasonably foreseeable transportation projects, would provide added capacity and
15 congestion relief to the regional transportation network. The projects would result in additional
16 beneficial cumulative transportation effects while improving regional air quality.

17 Impacts to sensitive environmental resources would also be cumulative. Changes in land use
18 could also alter noise patterns and visual characteristics throughout the corridor. The continued
19 urbanization of rural landscapes could impact outdoor recreation and biological resources.
20 Induced development could introduce or exacerbate the introduction of invasive species. It
21 could alter habitat characteristics or lead to substantial habitat loss of sensitive or protected
22 species, causing gradual changes in species composition, diversity, genetic makeup, and
23 overall species health. The CAP canal, built between 1973 and 1993, is a major linear project
24 that affected wildlife movement between the Tucson Mountains on the east and Ironwood
25 Forest National Monument, Roskrige Mountains, and Tohono O'odham Nation to the west.
26 Mitigation is in place along the CAP canal to improve wildlife movement, but the construction of
27 the Recommended Alternative would cumulatively add to the impacts to wildlife movement in
28 this area.

29 **3.17.5 Preferred Alternative**

30 **3.17.5.1 Indirect Effects**

31 The Preferred Alternative would experience similar indirect effects as the Recommended
32 Alternative; however, the level of induced growth would be less than the Recommended
33 Alternative due to the greater use of existing transportation corridors. Potential indirect effects
34 between Nogales and Casa Grande would depend on whether the east or west option in Pima
35 County is selected. The east option would provide mobility benefits by increasing capacity in
36 existing transportation corridors, while the west option in Pima County would provide benefits by
37 diverting traffic from congested areas along existing highways and provide an alternate route to
38 I-10. Indirect impacts with the west option in Pima County would be the same as Recommended
39 Alternative impacts.

40 **Figures 3.17-2** illustrates generalized areas where improved accessibility and project-induced
41 growth may occur from the Preferred Alternative.

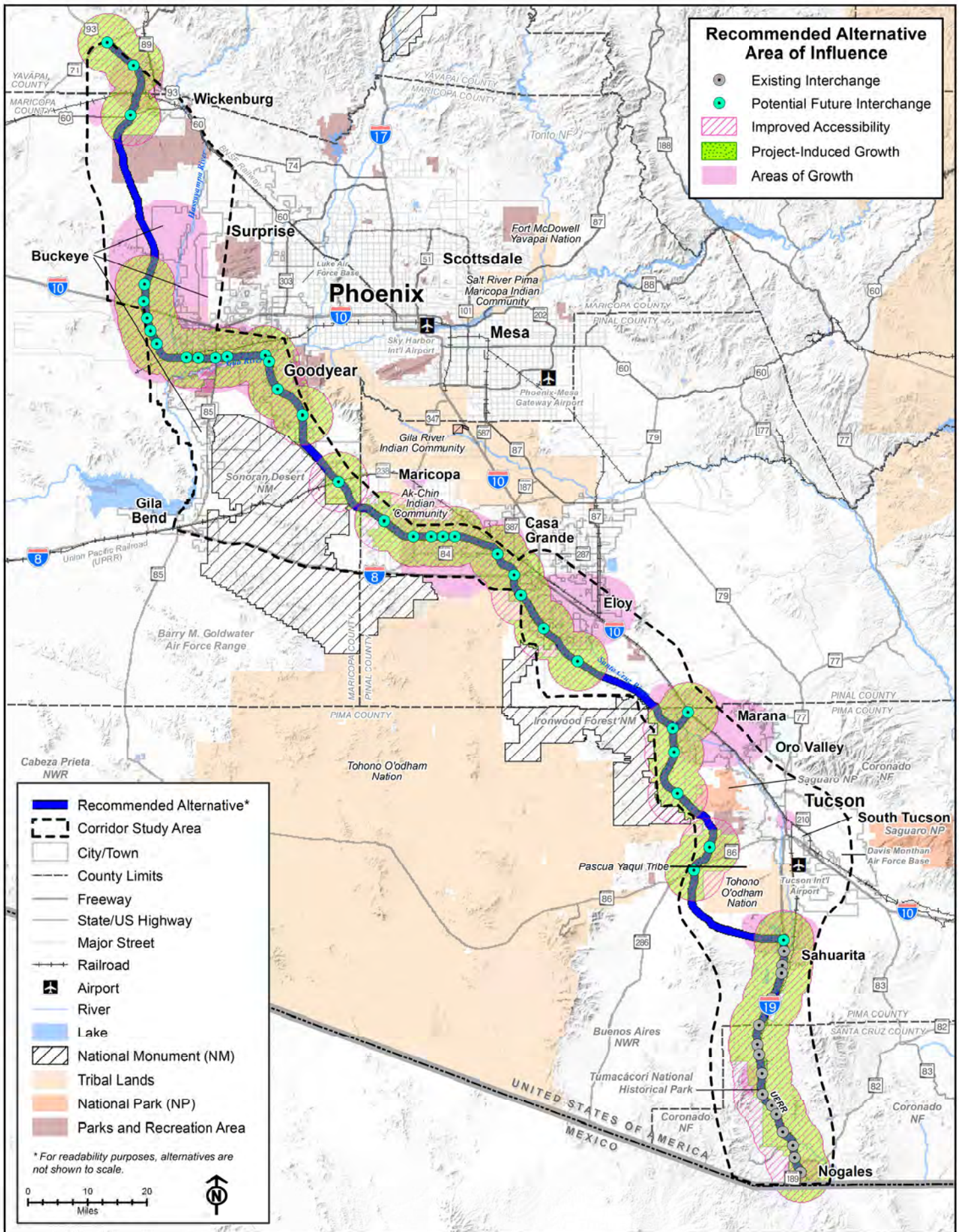


Figure 3.17-1. Recommended Alternative Area of Influence

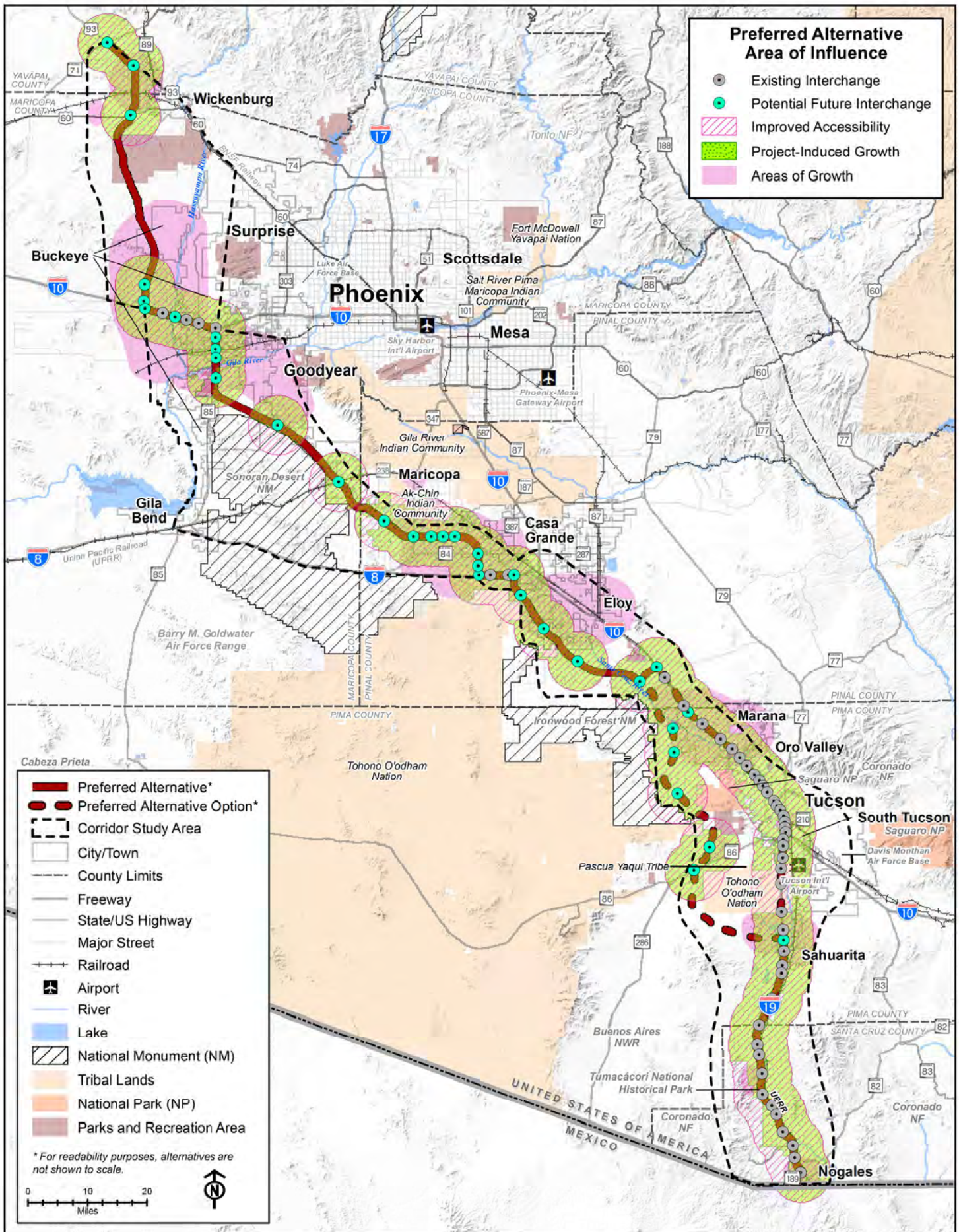


Figure 3.17-2. Preferred Alternative Area of Influence



1 **3.17.5.2 Cumulative Effects**

2 The Preferred Alternative would experience similar cumulative effects as the Recommended
3 Alternative throughout the corridor; however, the level of cumulative impacts would be less than
4 the Recommended Alternative, as the indirect impacts would be less due to the use of more
5 existing transportation corridors. Potential cumulative effects between Nogales and Casa
6 Grande would depend on whether the east option or the west option in Pima County is selected.

7 The Preferred Alternative with east option in Pima County would improve more existing
8 corridors with access already in place and would induce less growth, thus adding to fewer
9 effects overall to areas such as Nogales, Tucson, and Buckeye than the Recommended
10 Alternative. However, historically in downtown Tucson the construction and subsequent
11 widenings of I-10 have chipped away at adjacent historic districts. Any additional impacts would
12 further impact what is remaining of the historic districts. With the west option in Pima County,
13 impacts to wildlife connectivity would be same as the Recommended Alternative.

14 **3.17.6 Mitigation and Tier 2 Analysis**

15 **3.17.6.1 Tier 2 Analysis Commitments**

16 FHWA and ADOT completed an initial level of analysis in this Final Tier 1 EIS to identify a
17 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform
18 (1) the selection of a specific alignment (approximately 400 feet wide) within the selected
19 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.
20 Tier 2 analysis will also identify measures to avoid, minimize, or mitigate indirect and cumulative
21 impacts.

22 The indirect and cumulative effects would be revisited during the Tier 2 analysis to reflect a
23 more detailed understanding of a proposed project. A typical analysis used at the project level to
24 identify and assess cumulative effects would incorporate the following general concepts:
25 identifying resources, identifying geographic boundaries, discussing current health and historical
26 context, identifying reasonably foreseeable future actions, assessing effects, and reporting. The
27 *National Cooperative Highway Research Program Report 466: Desk Reference for Estimating*
28 *Indirect Effects of Proposed Transportation Projects* is one example of the type of guidance
29 used to address the complexity of indirect and cumulative effects (Transportation Research
30 Board 2002). During Tier 2 environmental review, ADOT would revisit the issue in coordination
31 with applicable agencies to either identify or develop an appropriate methodology for the indirect
32 and cumulative effects analysis.

33 The Tier 2 analysis would identify interchange locations based on land use patterns, growth,
34 and specific access needs, and would refine the indirect and cumulative effects based on a
35 more detailed alignment. Coordination would occur with state, regional, and local agencies to
36 identify local projects for consideration as part of the cumulative analysis. The Tier 2 analysis
37 would further refine the mitigation to minimize direct, indirect, and cumulative effects on
38 resources.



1 **3.17.6.2 Mitigation Commitments**

2 As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate
3 indirect and cumulative impacts from the Project (generally referred to as mitigation measures)
4 during this Tier 1 process. Specific mitigation that ADOT is committing to implement if a Build
5 Alternative is selected includes:

- 6 • **MM-Indirect-1:** Participate in continued, long-term planning efforts with metropolitan
7 planning organizations, local jurisdictions, resource agencies, and private stakeholders to
8 cooperatively plan development along the I-11 corridor. The effort would coordinate wildlife
9 connectivity, local land use planning, and context sensitive design for the I-11 facility. Details
10 regarding long-term planning efforts are dependent on the planning process for each
11 individual organization, jurisdiction, and/or agency. ADOT commits to participating in these
12 efforts but does not have the jurisdiction to lead them.
- 13 • **MM-Indirect-2:** If the Preferred Alternative with west option is selected during Tier 2 studies,
14 avoid building exits or interchanges between West Snyder Hill Road and Manville Road in
15 the area around the Tucson Mitigation Corridor in order to limit project-induced
16 development.

17 Mitigation commitments in technical resource areas that address direct and indirect impacts
18 would also mitigate cumulative impacts.

19 **3.17.6.3 Additional Mitigation to be Evaluated in Tier 2**

20 During the Tier 2 process, ADOT will evaluate mitigation measures in addition to those listed
21 above, to include best practices, permit requirements, and/or other mitigation strategies
22 suggested by agencies or the public.

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1 **3.18 Required Permits and Actions**

- 2 During the Tier 2 process, ADOT will review applicable permits needed for the I-11 project, as
- 3 no permits are required for this Tier 1 EIS.



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1 4 DRAFT PRELIMINARY SECTION 4(F) EVALUATION

2 4.1 Introduction

3 This chapter presents a revised Draft Preliminary Section 4(f) Evaluation of the I-11 Corridor
4 Project. The revised Draft Preliminary Section 4(f) Evaluation was prepared to comply with
5 Section 4(f) of the US Department of Transportation Act of 1966 (49 U.S.C. 303), hereinafter
6 referred to as “Section 4(f),” and its implementing regulations codified at 23 CFR Part 774.
7 Additional guidance was obtained from the revised FHWA *Section 4(f) Policy Paper* (FHWA
8 2012b). As allowed by 23 CFR 774.7(e)(1), a revised Draft Preliminary Section 4(f) Evaluation
9 was determined to be the appropriate level of evaluation in light of the tiered EIS approach.

10 The revised Draft Preliminary Section 4(f) Evaluation identifies properties that are afforded
11 protection by Section 4(f) (**Section 4.5**) and evaluates the potential use of these properties by
12 the Build Corridor Alternatives (**Section 4.6**).

13 4.2 Refinements Since Draft Tier 1 EIS

14 In response to publication of the Draft Tier 1 EIS and Draft Preliminary Section 4(f) Evaluation in
15 March 2019, FHWA and ADOT received comments on the document from agencies and the
16 public. FHWA and ADOT considered the findings of the Draft Tier 1 EIS as well as the public
17 and agency comments in preparation of the Final Tier 1 EIS and revised Draft Preliminary
18 Section 4(f) Evaluation, including the creation of a Preferred Alternative in this Final Tier 1 EIS
19 that is different from the Recommended Alternative in the Draft Tier 1 EIS. The Preferred
20 Alternative balances transportation needs with impacts to the natural and human environment
21 and stakeholder input. Refer to **Chapter 6** (Preferred Alternative) for details on the Preferred
22 Alternative.

23 4.3 Alternatives Evaluated

24 This revised Draft Preliminary Section 4(f) Evaluation assesses the Preferred Alternative
25 identified in this Final Tier 1 EIS. The Preferred Alternative has two corridor options in Pima
26 County: a west option on new alignment to the west of the City of Tucson (west option), and an
27 east option on existing highway corridors through the City of Tucson (east option). FHWA and
28 ADOT identified these alternatives for further study after considering the findings of the Draft
29 Preliminary Section 4(f) Evaluation, the findings of the Draft Tier 1 EIS, and public and agency
30 comments on the Draft Tier 1 EIS and Draft Preliminary Section 4(f) Evaluation.

31 For comparison purposes and to support the analyses in this revised Draft Preliminary Section
32 4(f) Evaluation, the Purple, Green, and Orange Build Corridor Alternatives, as well as the
33 Recommended Alternative identified in the Draft Tier 1 EIS, are also evaluated. **Figure 4-1**,
34 **Figure 4-2**, **Figure 4-3**, **Figure 4-4**, and **Figure 4-5** show the Build Corridor Alternatives.

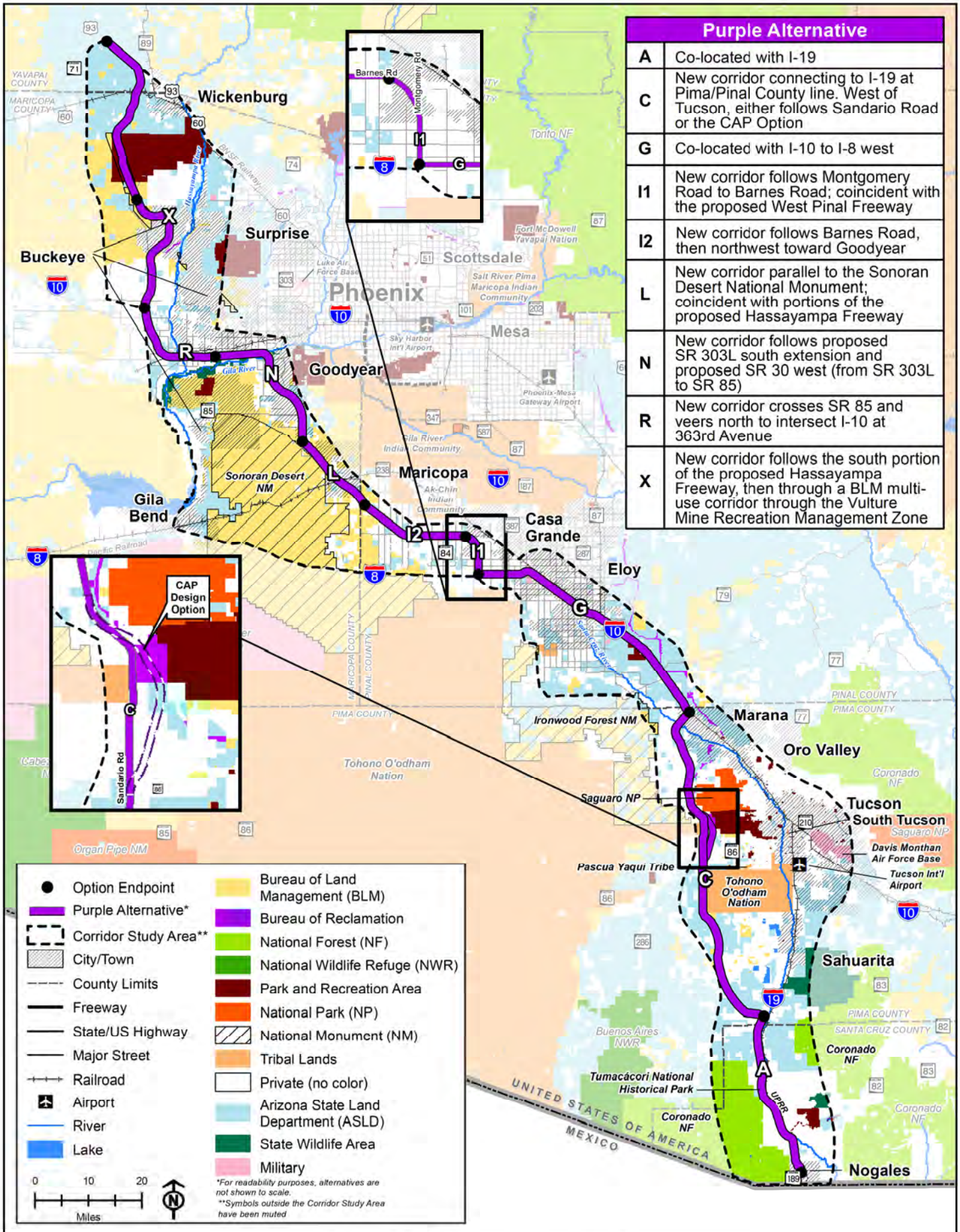


Figure 4-1. Purple Alternative

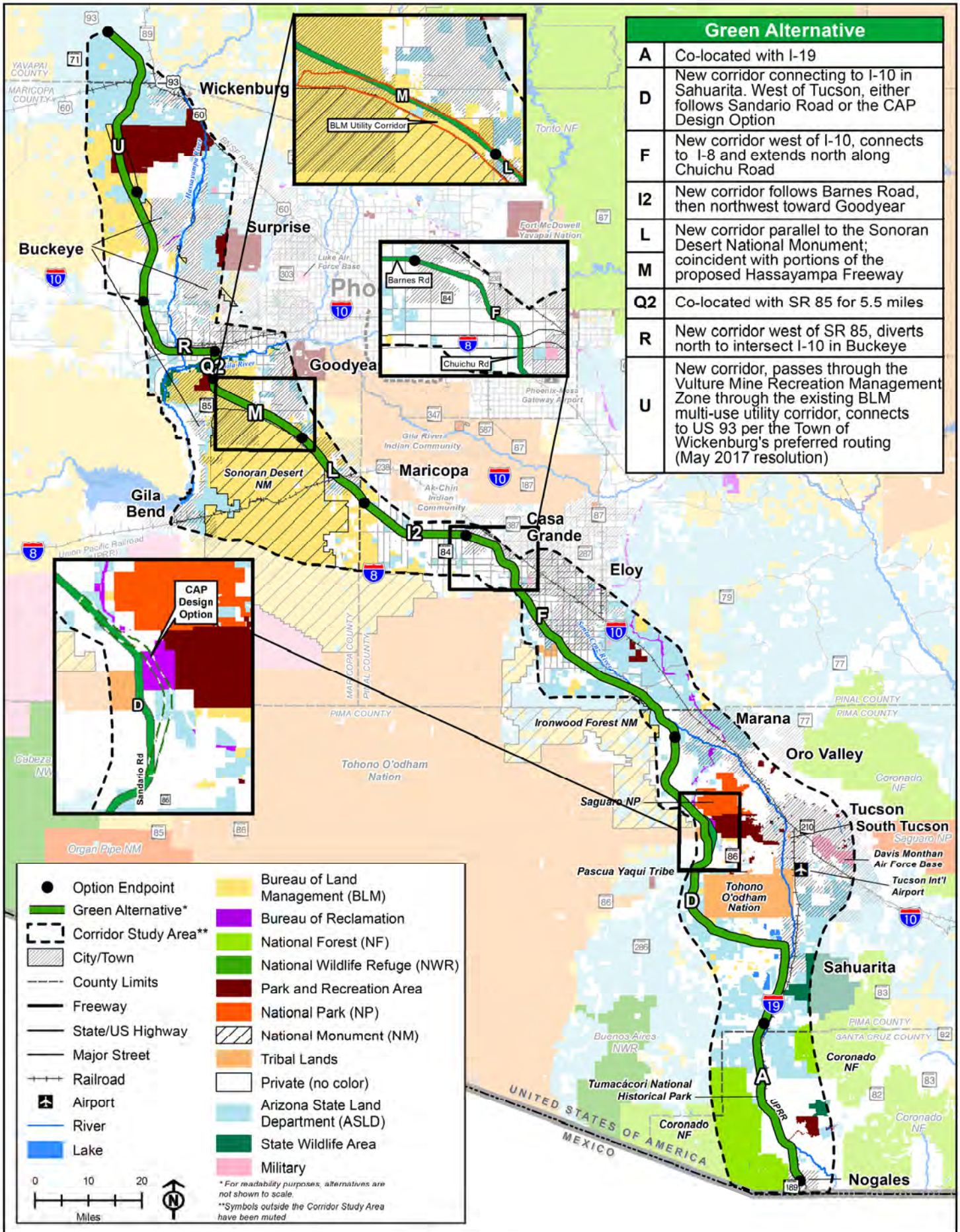


Figure 4-2. Green Alternative

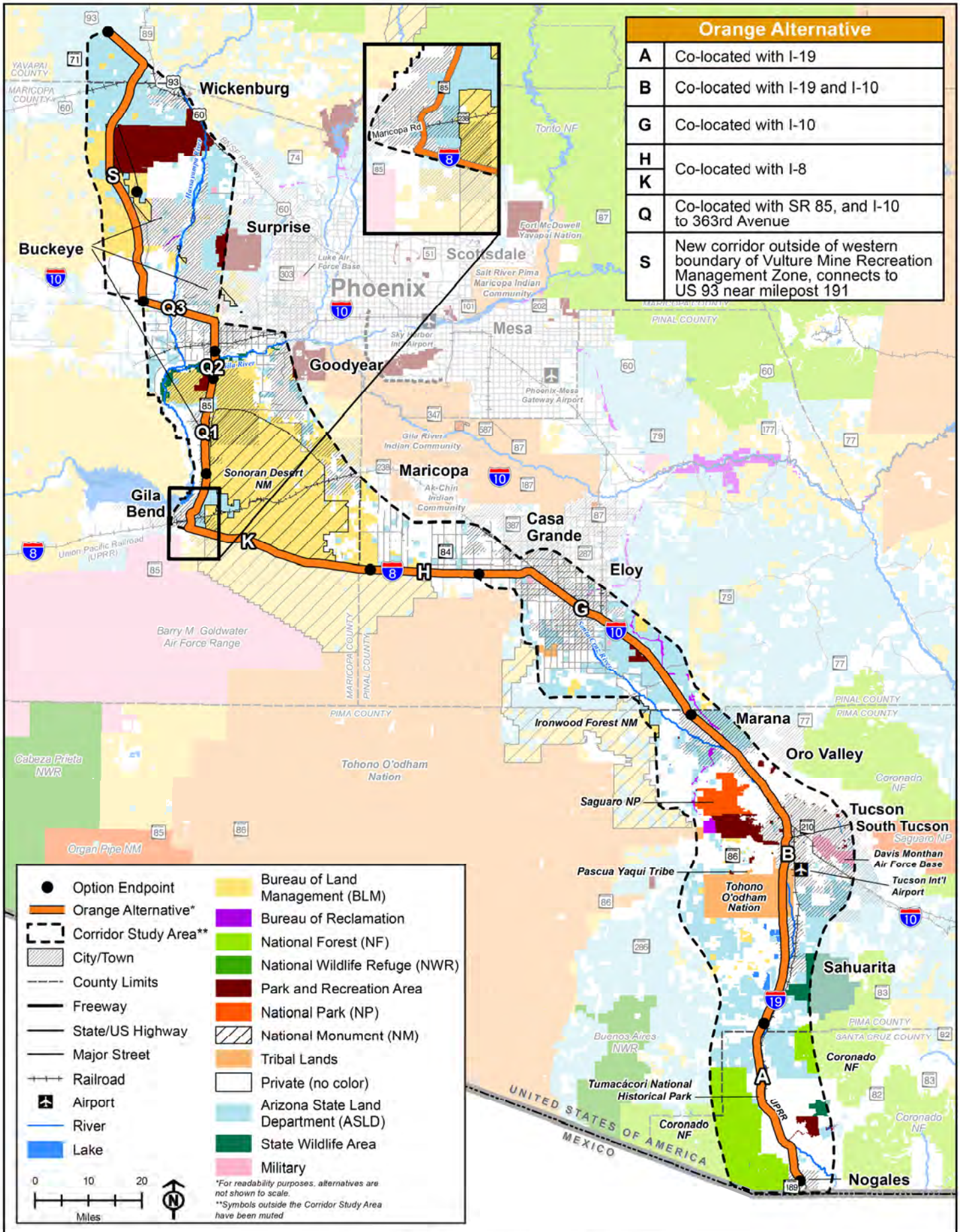


Figure 4-3. Orange Alternative

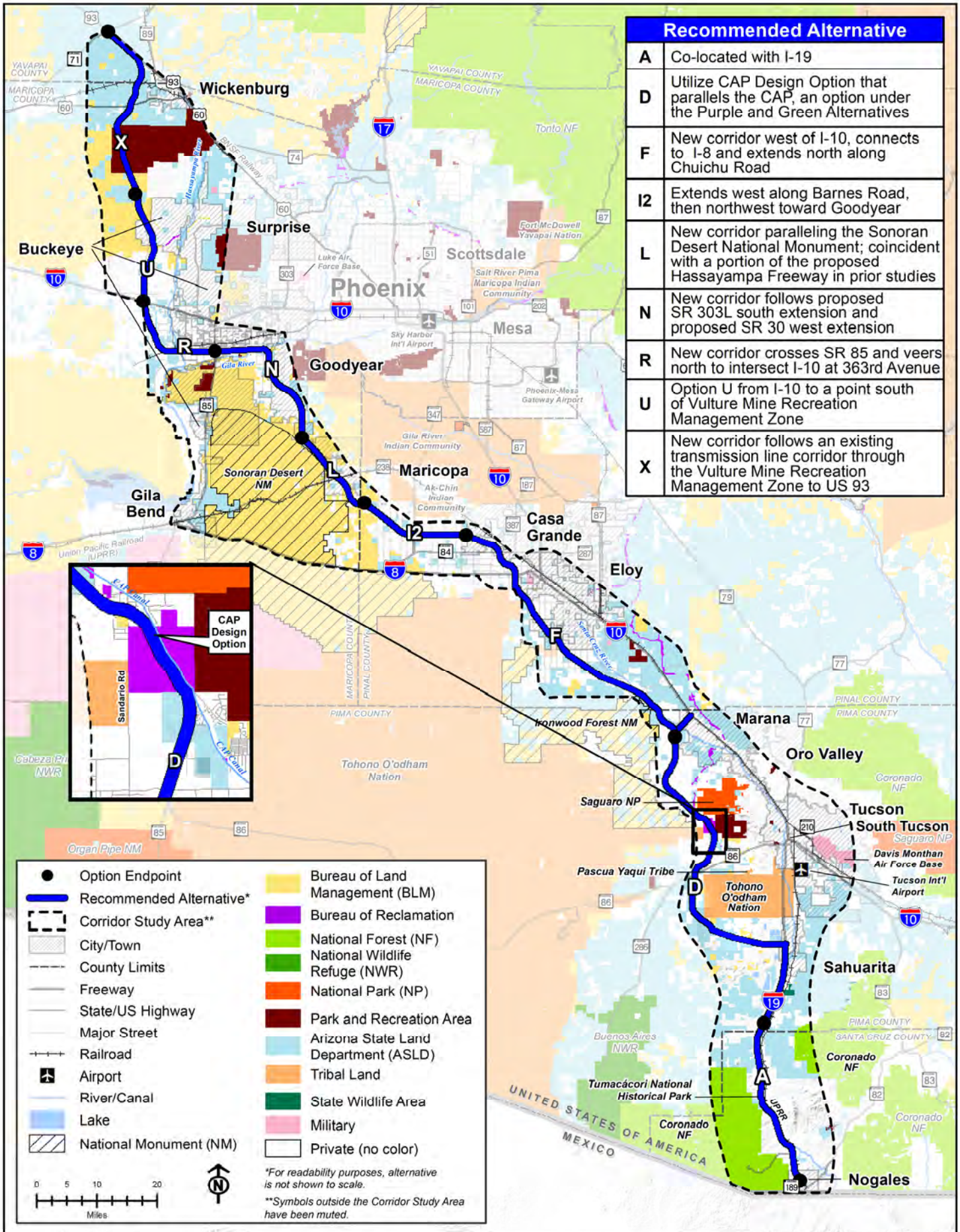


Figure 4-4. Recommended Alternative

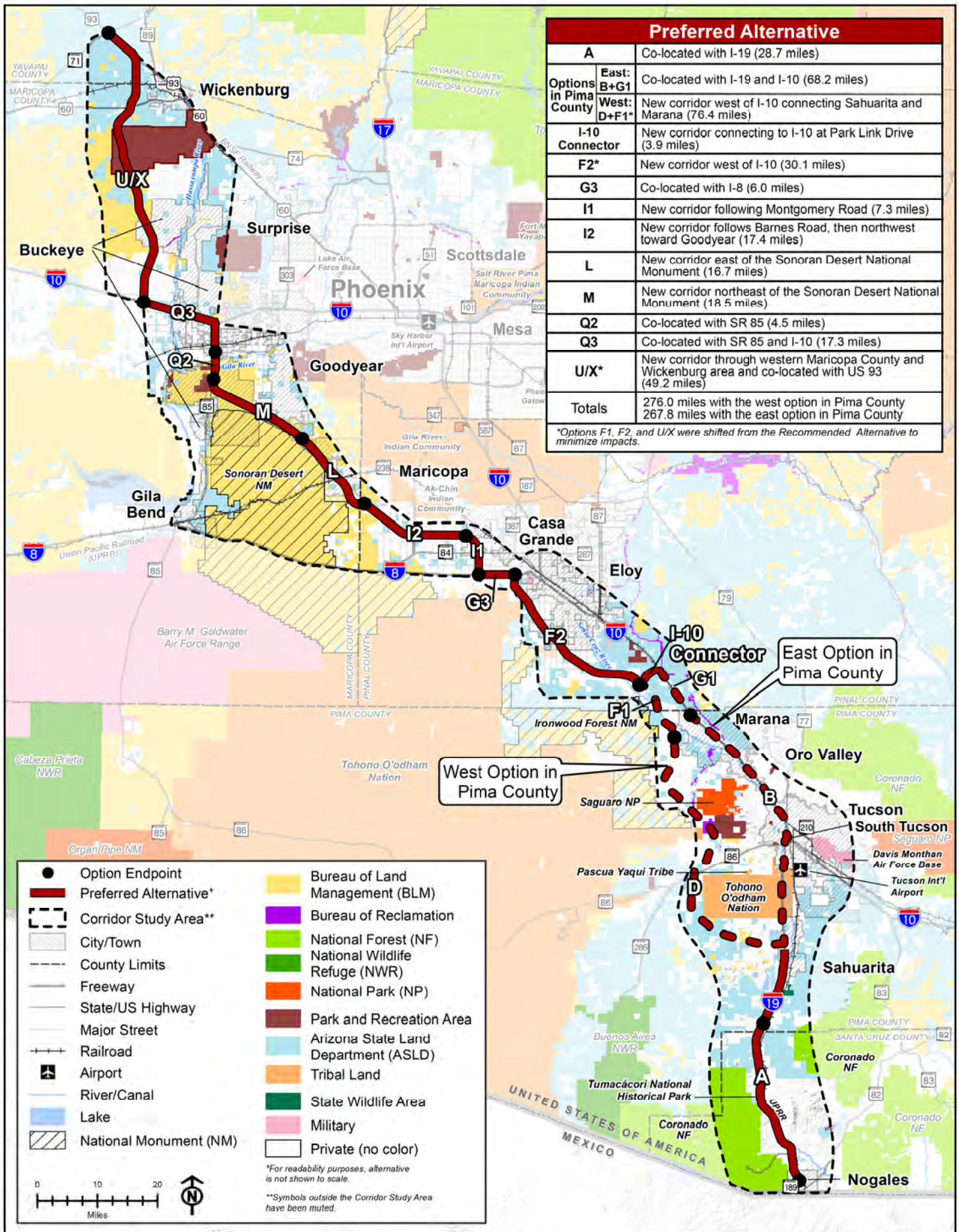


Figure 4-5. Preferred Alternative



1 FHWA will make its Final Preliminary Section 4(f) determination as part of the Record of
2 Decision for the Tier 1 process. The public comment period for the Final Preliminary Section 4(f)
3 Evaluation is equal in duration to and concurrent with the comment period for the Final Tier 1
4 EIS.

5 **4.4 Regulatory Context and Methodology**

6 The law on lands, wildlife and waterfowl refuges, and historic sites that is codified in Title 49 of
7 the U.S.C. 303 states, “The Secretary of Transportation may approve a transportation program
8 or project (other than any project for a park road or parkway under section 204 [1] of title 23)
9 requiring the use of publicly owned land of a public park, recreation area, or wildlife and
10 waterfowl refuge of national, State, or local significance, or land of an historic site of national,
11 State, or local significance (as determined by the federal, state, or local officials having
12 jurisdiction over the park, area, refuge, or site) only if:

- 13 • There is no prudent and feasible alternative to using that land; and
- 14 • The program or project includes all possible planning to minimize harm to the park,
15 recreation area, wildlife and waterfowl refuge, or historic site resulting from the use; or
- 16 • The Administration determines that the use of the property, including any measure(s) to
17 minimize harm (such as any avoidance, minimization, mitigation, or enhancement
18 measures) committed to by the applicant, will have a *de minimis* use, as defined in Sec.
19 774.17, on the property.”

20 **Section 4.4.5** defines the officials with jurisdiction in a Section 4(f) evaluation.

21 **4.4.1 Applicability**

22 Section 4(f) applies to the use of significant public parks, recreation areas, wildlife and waterfowl
23 refuges, and historic sites. Public parks, recreation areas, and wildlife and waterfowl refuges are
24 properties that have been officially designated by a federal, state, or local agency, and the
25 official with jurisdiction over each property determines that its primary purpose (primary function)
26 is as a public park, recreation area, or wildlife and waterfowl refuge. In addition, the property
27 must be a significant public park, recreation area, or wildlife and waterfowl refuge. Significance
28 means that in comparing the availability and function of the property with the objectives of the
29 officials with jurisdiction over the property, the property plays an important role in meeting those
30 objectives. Significance is determined in consultation with officials having jurisdiction over those
31 properties (refer to 23 CFR 774.11, Applicability).

32 **4.4.2 Definitions of Use**

33 Pursuant to 23 CFR 774.17 and “except as set forth in Section 774.11 and 774.13, a ‘use’ of
34 Section 4(f) property occurs: (1) when land is permanently incorporated into a transportation
35 facility; (2) when there is a temporary occupancy of land that is adverse in terms of the statute’s
36 preservation purpose as determined by the criteria in Section 774.13(d); or (3) when there is a
37 constructive use of a Section 4(f) property as determined by the criteria in Section 774.15.”



1 **Permanent Use.** As outlined in Section 3.3.3 of FHWA's *Section 4(f) Policy Paper* (FHWA
2 2012b), an individual Section 4(f) evaluation must be completed when approving a project that
3 requires the use of Section 4(f) property if the use, as described in Sections 3.1 and 3.2 (of the
4 policy paper: Identification of Section 4(f) Properties and Assessing the Use of Section 4(f)
5 Properties), results in a greater than *de minimis* use and a programmatic Section 4(f) evaluation
6 cannot be applied to the situation (23 CFR 774.3).

7 **Constructive Use.** As defined in 23 CFR 774.15(a), "a constructive use occurs when a
8 transportation project does not incorporate land from a Section 4(f) property, but the project's
9 proximity impacts are so severe that the protected activities, features, or attributes that qualify a
10 property for protection under Section 4(f) are substantially impaired. Substantial impairment
11 occurs only when the protected activities, features, or attributes of the property are substantially
12 diminished." A project's proximity to a Section 4(f) property is not in itself an impact that results
13 in constructive use. Due to the subjective nature of proximity impacts, a determination of
14 constructive use is rare.

15 **Temporary Occupancy.** 23 CFR 774.13(d) defines temporary occupancies of land from a
16 Section 4(f) property as being "so minimal as to not constitute a use within the meaning of
17 Section 4(f). The following conditions must be satisfied: (1) Duration must be temporary, i.e.,
18 less than the time needed for construction of the project, and there should be no change in
19 ownership of the land; (2) Scope of the work must be minor, i.e., both the nature and the
20 magnitude of the changes to the Section 4(f) property are minimal; (3) There are no anticipated
21 permanent adverse physical impacts, nor will there be interference with the protected activities,
22 features, or attributes of the property, on either a temporary or permanent basis; (4) The land
23 being used must be fully restored, i.e., the property must be returned to a condition which is at
24 least as good as that which existed prior to the project; and (5) There must be documented
25 agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above
26 conditions."

27 **4.4.3 Types of Section 4(f) Approvals**

28 FHWA may not approve the use, as defined in Section 774.17, of a Section 4(f) property unless
29 a determination is made under paragraph (a) or (b) of 23 CFR 774.3: "(1) There is no feasible
30 and prudent avoidance alternative, as defined in Sec. 774.17, to the use of land from the
31 property; and (2) The action includes all possible planning, as defined in Sec. 774.17, to
32 minimize harm to the property resulting from such use; or (b) The Administration determines
33 that the use of the property, including any measure(s) to minimize harm (such as any
34 avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant,
35 will have a *de minimis* use, as defined in Section 774.17, on the property."

36 As stated in 23 CFR 774.17, "(1) For historic sites, *de minimis* use means that the
37 Administration has determined, in accordance with 36 CFR part 800 that no historic property is
38 affected by the project or that the project will have 'no adverse effect' on the historic property in
39 question. (2) For parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* use is
40 one that will not adversely affect the features, attributes, or activities qualifying the property for
41 protection under Section 4(f)." When a Tier 1 EIS is prepared, the regulations of Section 4(f)
42 allow for a preliminary Section 4(f) approval of a *de minimis* use or a not *de minimis* use,
43 provided that opportunities to minimize harm at subsequent stages in the project development
44 process are not precluded by the Tier 1 decisions (23 CFR 774.7(e)(1)).



1 The type of approval being sought in the Section 4(f) evaluation for the I-11 Corridor is a
2 preliminary Section 4(f) approval, which applies when a first-tier, broad-scale EIS is prepared.
3 “When the first-tier, broad-scale EIS is prepared, the detailed information necessary to complete
4 the Section 4(f) approval may not be available at that stage in the development of the action. In
5 such cases, the documentation should address the potential impacts that a proposed action will
6 have on Section 4(f) properties and whether those impacts could have a bearing on the decision
7 to be made. A preliminary Section 4(f) approval may be made at this time as to whether the
8 impacts resulting from the use of a Section 4(f) property are a *de minimis* use or whether there
9 are feasible and prudent avoidance alternatives. This preliminary approval will include all
10 possible planning to minimize harm to the extent that the level of detail available at the first-tier
11 EIS stage allows. It is recognized that such planning at this stage may be limited to ensuring
12 that opportunities to minimize harm at subsequent stages in the development process have not
13 been precluded by decisions made at the first-tier stage. This preliminary Section 4(f) approval
14 is then incorporated into the first-tier EIS. The Section 4(f) approval will be finalized in the
15 second-tier Study (23 CFR 774.7(e)).”

16 4.4.4 Section 4(f) Evaluation Process

17 4.4.4.1 Individual Section 4(f) Evaluations

18 Individual Section 4(f) evaluations involve the following steps:

- 19 1. **Determine Applicability.** In this step, FHWA identifies parks, recreational areas, wildlife
20 and waterfowl refuges, and historic sites that are protected by Section 4(f) using the
21 definitions of primary purpose and significance described in **Section 4.4.1.**
- 22 2. **Assess Impact and Determine Use.** FHWA determines what impact a project would have
23 on each protected property and what type of use that impact would be, using the definitions
24 in 23 CFR 774 and described in **Section 4.4.2.**
- 25 3. **Analyze Avoidance Alternatives.** In this step, FHWA and ADOT consider alternatives that
26 completely avoid the potential use of a Section 4(f) property. The avoidance analysis applies
27 the Section 4(f) feasible and prudent criteria (23 CFR 774.17(2) and (3)). “An alternative is
28 not feasible if it cannot be built as a matter of sound engineering judgment. An alternative is
29 not prudent if:
 - 30 ○ **Factor 1.** It compromises the project to a degree that it is unreasonable to proceed with
31 the project in light of its stated purpose and need;
 - 32 ○ **Factor 2.** It results in unacceptable safety or operational problems;
 - 33 ○ **Factor 3.** After reasonable mitigation, it still causes:
 - 34 ▪ Severe social, economic, or environmental impacts;
 - 35 ▪ Severe disruption to established communities;
 - 36 ▪ Severe, disproportionate impacts on low-income or minority populations; or



- 1 ▪ Severe impacts on environmental resources protected under other Federal statutes;
- 2 ○ **Factor 4.** It results in additional construction, maintenance, or operational costs of an
3 extraordinary magnitude;
- 4 ○ **Factor 5.** It causes other unique problems or unusual factors; or
- 5 ○ **Factor 6.** It involves multiple factors in (Factors 1 through 5) of this definition, that while
6 individually minor, cumulatively cause unique problems or impacts of extraordinary
7 magnitude.”
- 8 4. **Determine Alternative with Least Overall Harm.** If the avoidance analysis concludes there
9 is no feasible and prudent avoidance alternative, then in accordance with 23 CFR 774.3(c)1
10 FHWA “may approve only the alternative that: Causes the least overall harm in light of the
11 statue’s preservation purpose. The least overall harm is determined by balancing the
12 following factors: (1) the ability to mitigate adverse impacts to each Section 4(f) property
13 (including any measures that result in benefits to the property); (2) the relative severity of the
14 remaining harm, after mitigation, to the protected activities, attributes, or features that qualify
15 each Section 4(f) property for protection; (3) the relative significance of each Section 4(f)
16 property; (4) the views of the official(s) with jurisdiction over each Section 4(f) property;
17 (5) the degree to which each alternative meets the purpose and need for the project;
18 (6) after reasonable mitigation, the magnitude of any adverse effects to resources not
19 protected by Section 4(f); and (7) substantial differences in costs among the alternatives.”
- 20 5. **Consider All Planning to Minimize Harm.** After the determination that there are no
21 feasible and prudent alternatives to avoid a Section 4(f) property, FHWA and ADOT
22 consider and incorporate all possible planning to minimize the impacts of the project. All
23 possible planning, as defined in 23 CFR 774.17, means “all reasonable measures identified
24 in the Section 4(f) evaluation to minimize harm or mitigate for adverse impacts and effects
25 must be included in the project.”
- 26 6. **Coordination and Public Involvement.** The Section 4(f) regulations require FHWA to
27 coordinate with the officials with jurisdiction over each of the Section 4(f) properties for which
28 a determination is made in this Draft Preliminary Section 4(f) Evaluation. In compliance with
29 the requirements of Section 4(f) (23 CFR 774.5), the steps in coordination include:
- 30 ○ “For historic properties:
- 31 ▪ (i) The consulting parties identified in accordance with 36 CFR part 800 must be
32 consulted; and
- 33 ▪ (ii) The Administration must receive written concurrence from the pertinent State
34 Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO),
35 and from the Advisory Council on Historic Preservation (ACHP) if participating in the
36 consultation process, in a finding of ‘no adverse effect’ or ‘no historic properties
37 affected’ in accordance with 36 CFR part 800. The Administration shall inform these
38 officials of its intent to make a *de minimis* use determination based on their
39 concurrence in the finding of ‘no adverse effect’ or ‘no historic properties affected.’



- 1 ▪ (iii) Public notice and comment, beyond that required by 36 CFR part 800, is not
2 required.
- 3 ○ For parks, recreation areas, and wildlife and waterfowl refuges:
- 4 ▪ (i) Public notice and an opportunity for public review and comment concerning the
5 effects on the protected activities, features, or attributes of the property must be
6 provided. This requirement can be satisfied in conjunction with other public
7 involvement procedures, such as a comment period provided on a NEPA document.”

8 **4.4.4.2 De Minimis Use Evaluations**

9 In a *de minimis* use evaluation, the following steps apply, as stated in 23 CFR 774.7(b) and
10 23 CFR 774.5(c):

- 11 1. **Determine that the Proposed Use is *de minimis*.** “A *de minimis* use determination under
12 Sec. 774.3(b) shall include sufficient supporting documentation to demonstrate that the
13 impacts, after avoidance, minimization, mitigation, or enhancement measures are taken into
14 account, are *de minimis* uses as defined in Sec. 774.17; and that the coordination required
15 in Sec. 774.5(b) has been completed.
- 16 2. **Coordination and Public Involvement.** Prior to making *de minimis* use determinations
17 under Sec. 774.3(b), the following coordination shall be undertaken:
 - 18 ○ (1) For historic properties: (i) The consulting parties identified in accordance with 36 CFR
19 part 800 (Section 106) must be consulted; and (ii) FHWA must receive written
20 concurrence from the pertinent SHPO or THPO, and from the ACHP if participating in
21 the consultation process, in a finding of ‘no adverse effect’ or ‘no historic properties
22 affected’ in accordance with 36 CFR part 800. FHWA shall inform these officials of its
23 intent to make a *de minimis* use determination based on their concurrence in the finding
24 of ‘no adverse effect’ or ‘no historic properties affected.’ (iii) Public notice and comment,
25 beyond that required by 36 CFR part 800, is not required.
 - 26 ○ (2) For parks, recreation areas, and wildlife and waterfowl refuges: (i) Public notice and
27 an opportunity for public review and comment concerning the effects on the protected
28 activities, features, or attributes of the property must be provided. This requirement can
29 be satisfied in conjunction with other public involvement procedures, such as a comment
30 period provided on a NEPA document. (ii) The Administration shall inform the official(s)
31 with jurisdiction of its intent to make a *de minimis* use finding. Following an opportunity
32 for public review and comment as described in paragraph (b)(2)(i) of this section, the
33 official(s) with jurisdiction over the Section 4(f) resource must concur in writing that the
34 project will not adversely affect the activities, features, or attributes that make the
35 property eligible for Section 4(f) protection. This concurrence may be combined with
36 other comments on the project provided by the official(s).”

37 **4.4.4.3 Constructive Use Evaluations**

38 In a constructive use evaluation, the following steps apply, as stated in 23 CFR 774.15(d):



- 1 1. **Determine Applicability.** “Identification of the current activities, features, or attributes of the
2 property which qualify for protection under Section 4(f) and which may be sensitive to
3 proximity impacts;”
- 4 2. **Proximity Impacts Analysis.** “An analysis of the proximity impacts of the proposed project
5 on the Section 4(f) property. If any of the proximity impacts will be mitigated, only the net
6 impact need be considered in this analysis. The analysis also should describe and consider
7 the impacts which could reasonably be expected if the proposed project were not
8 implemented, since such impacts should not be attributed to the proposed project; and”
- 9 3. **Coordination.** “Consultation, on the foregoing identification and analysis, with the official(s)
10 with jurisdiction over the Section 4(f) property.”

11 4.4.4.4 Corridor Study Area

12 The Corridor Study Area is defined as the broad geographic area within which the Build Corridor
13 Alternatives occur. The Corridor Study Area is the area within which potential Section 4(f)
14 properties were identified for study in this chapter and is shown on **Figure 4-1**.

15 4.4.5 Officials with Jurisdiction

16 The Section 4(f) regulation (23 CFR 774.17) defines officials with jurisdiction over parks,
17 recreation areas, wildlife and waterfowl refuges, and historic sites as

18 “(1) In the case of historic properties, the official with jurisdiction is the State Historic
19 Preservation Office (SHPO) for the State wherein the property is located or, if the
20 property is located on tribal land, the Tribal Historic Preservation Officer (THPO). If the
21 property is located on tribal land but the Indian tribe has not assumed the responsibilities
22 of the SHPO as provided for in the National Historic Preservation Act (NHPA), then a
23 representative designated by such Indian tribe shall be recognized as an official with
24 jurisdiction in addition to the SHPO. When the Advisory Council on Historic Preservation
25 (ACHP) is involved in a consultation concerning a property under Section 106 of the
26 NHPA, the ACHP also is an official with jurisdiction over that resource for purposes of
27 this part. When the Section 4(f) property is a National Historic Landmark, the National
28 Park Service also is an official with jurisdiction over that resource for purposes of this
29 part. (2) In the case of public parks, recreation areas, and wildlife and waterfowl refuges,
30 the official(s) with jurisdiction are the official(s) of the agency or agencies that own or
31 administer the property in question and who are empowered to represent the agency on
32 matters related to the property.”

33 4.5 Identification of Section 4(f) Properties

34 FHWA and ADOT reviewed existing maps (including GIS data and online maps available from
35 federal, state, county, and city agencies), searched property records, and consulted with
36 officials with jurisdiction to identify the properties protected by Section 4(f) within the I-11
37 Corridor Study Area, as defined by 23 U.S.C. 138(a) and 49 U.S.C. 303(a), for the following:

- 38 1. “Parks and recreational areas of national, state or local significance that are both publicly
39 owned and open to the public;

- 1 2. Publicly owned wildlife and waterfowl refuges of national, state or local significance that are
2 open to the public to the extent that public access does not interfere with the primary
3 purpose of the refuge; and
- 4 3. Historic sites of national, state or local significance in public or private ownership regardless
5 of whether they are open to the public.”

6 Public ownership and administration of parks, recreation areas, and wildlife and waterfowl
7 refuges were verified through available documentation as well as coordination with the officials
8 with jurisdiction over those properties. Properties that meet definitions 1 and 2 above are
9 presumed to be significant unless the official with jurisdiction over a property concludes that the
10 site is not significant. FHWA will make an independent evaluation under such circumstances
11 and may override the official with jurisdiction. FHWA defines significance in its *Section 4(f)*
12 *Policy Paper* (FHWA 2012b) as follows: “comparing the availability and function of the park,
13 recreation area or wildlife and waterfowl refuge, with the park, recreation area or wildlife and
14 waterfowl refuge objectives of the agency, community or authority, the property in question
15 plays an important role in meeting those objectives.” In making such an evaluation, FHWA
16 examines the primary purpose of the property. As described in FHWA’s *Section 4(f) Policy*
17 *Paper* (response to Question 1A), primary purpose “is related to a property’s primary function
18 and how it is intended to be managed. Incidental, secondary, occasional or dispersed activities
19 similar to park, recreational or refuge activities do not constitute a primary purpose within the
20 context of Section 4(f).”

21 As discussed in the Final Tier 1 EIS **Section 3.7** (Archaeological, Historical, Architectural, and
22 Cultural Resources), historic sites that meet definition 3 above were identified by reviewing the
23 NRHP and information provided by State Historic Preservation Office (SHPO) and the Tucson
24 Historic Preservation Office. Historic sites are significant if they are listed on the NRHP or have
25 been determined to be eligible for listing on the NRHP (*Section 4(f) Policy Paper Answer to*
26 *Question 2A*). FHWA consults with the SHPO, the official with jurisdiction over historic sites,
27 tribes, and other consulting parties, and determines significance based on the context of Section
28 106 of the NHPA (36 CFR 800). At this Tier 1 stage, previous determinations of eligibility are
29 being used. Section 106 evaluations of the properties and effects will be determined during Tier
30 2 undertakings.

31 While both Section 106 and Section 4(f) are preservation legislation and are both considered in
32 the NEPA process, Section 106 applies to all federal undertakings and Section 4(f) applies to
33 only USDOT actions. Section 106 considers the “effect” of an undertaking, while Section 4(f)
34 considers the “use of a property” by an undertaking. Section 4(f) is not integral to Section 106,
35 but Section 106 is integral to Section 4(f) compliance insofar as historic sites are concerned.
36 Section 106 requires consultation and possibly mitigation, while Section 4(f) requires analysis of
37 avoidance, then all possible planning to minimize harm.

38 **4.5.1 Parks, Recreation Areas, or Wildlife and Waterfowl Refuges**

39 **Table 4-1** lists the Section 4(f) properties from south to north in the Corridor Study Area. **Figure**
40 **4-6** through **Figure 4-11** show the location of each property in relation to the Build Corridor
41 Alternatives.



1 **Table 4-1. Potential Parks, Recreation Areas, and Wildlife/Waterfowl Refuges in the Corridor Study Area**

Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
Multiple Counties					
1	Juan Bautista de Anza National Historic Trail	Recreation trail (multi-state)	<p>Santa Cruz, Pima, Pinal, and Maricopa Counties, Arizona (part of 1,200-mile multi-state historic trail)</p> <p>Santa Cruz County: 4.5 miles between Tumacácori National Historical Park to Tubac Presidio State Historic Park</p> <p>Pima County: Elephant Road to Torres Blanca Golf Club (approximately 7 miles), on the east side of and parallel to I-19</p> <p>Pinal County: part of Pinal County-adopted and proposed 80-mile corridor (TR-2)</p> <p>Maricopa County: 13 miles on BLM land co-aligned with Mormon Battalion Trail and Butterfield Overland Mail stage route at Butterfield Pass</p>	NPS administers; implemented by other government agencies, including counties, private nonprofits (such as the Anza Trail Foundation), and private citizens	A commemorative route of the de Anza expeditions; Corridor Study Area includes existing and proposed trail segments, including walking, auto, and off-road elements



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
Santa Cruz County					
2	Nogales Recreation Area and existing/planned critical habitat areas (portion of Coronado National Forest)	Recreation area	303 Old Tucson Road, Nogales, AZ	USDA, Forest Service owns land	Forest is 1.8 million acres; resource management for multiple uses (sustaining sky island ecosystems, mining, range grazing, wilderness, recreation); areas developed for recreation are not in the vicinity of I-19; critical wildlife habitat areas – this area was identified in the recent EIS for the property for determining motorized and non-motorized access. Roadless areas or wilderness: Pajarita and Mount Wrightson
Pima County					
3	Tubac Presidio State Historic Park	Public park	1 Burruel Street, Tubac, AZ 85646	Arizona State Parks	8 acres, historical interpretation
4	Historic Hacienda de la Canoa (Raul M. Grijalva Canoa Ranch Conservation Park)	Historic site and recreation area	5375 South I-19 Frontage Road, Green Valley, AZ	Pima County	4,950 acres, historical and natural resources preservation and interpretation
5	Canoa Preserve Park	Public park	35 South Camino de la Canoa, Green Valley, AZ	Pima County	6 acres, baseball fields, ramada with picnic table
5a	Abrego Trailhead	Trail access point	2105 South Abrego Drive, Green Valley, AZ	Pima County	4 acres, off-street vehicle and horse trailer parking, shade structure
6	Quail Creek-Veterans Municipal Park	Public park	1905 North Old Nogales Highway, Sahuarita, AZ	Town of Sahuarita	25 acres, playground, picnic area, walking paths, dog area



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
7	Parque Los Arroyos	Public park	18225 South Avenida Arroyo Seco, Sahuarita, AZ	Town of Sahuarita	7 acres, playground, basketball court, picnic areas
8	Anamax Park	Public park	17501 South Camino Royale De Las Quintas, Sahuarita, AZ	Town of Sahuarita	36 acres, recreation center, ballfields, dog park
9	Sahuarita Lake Park	Public park	15466 South Rancho Sahuarita Boulevard, Sahuarita, AZ	Town of Sahuarita	15 acres with lake, boating, pathway, amphitheater, gazebos
10	North Santa Cruz Park	Public park	14455 South Rancho Sahuarita Boulevard, Sahuarita, AZ	Town of Sahuarita	15 acres, ballfields, skating and playground areas, picnic facilities, pathway, restrooms
11	Summit Park	Public park	1800 East Summit Street, Tucson, AZ	Pima County	9 acres, ballfields, picnic area, playground
12	Star Valley Park	Public park	6852 West Brightwater Way, Tucson, AZ	Pima County	14 acres, basketball court, dog park, trails, picnic areas, playgrounds
13	Lawrence Park	Public park	6777 South Mark Road, Tucson, AZ	Pima County	30 acres, ballfields, playground, picnic areas, path
14	Mission Ridge Park	Public park	3121 West Tucker Street, Tucson, AZ	Pima County	6 acres, ballfields, picnic area
15	Ebonee Marie Moody Park	Public park	6925 South Cardinal Avenue, Tucson, AZ	Pima County	5 acres, ballfields, playground, picnic area, horseshoes
16	Pima Community College, Desert Vista Campus	Public access to recreation facilities	5901 South Calle Santa Cruz, Tucson, AZ	City of Tucson	4 acres, fitness center and ballfields
17	Mission Manor Park	Public park	701 West Calle Ramona, Tucson, AZ	City of Tucson	6 acres, ballfields adjacent to Mission Manor Elementary School



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
18	CSM Martin “Gunny” Barreras Memorial Park (formerly Sunnyside Park)	Public park	5811 South Del Moral Boulevard, Tucson, AZ	City of Tucson and Sunnyside Unified School District	33 acres, ballfields adjacent to Sunnyside District School
19	Branding Iron Park	Public park	5900 Branding Iron Circle, Tucson, AZ	Pima County	2 acres, basketball court, picnic area, swings
20	Oak Tree Park	Public park	5433 South Oak Tree Drive, Tucson, AZ	City of Tucson	8 acres, ballfields, ball court
21	Winston Reynolds – Manzanita District Park	Public park	5200 South Westover Avenue, Tucson, AZ	Pima County	69 acres, community center, pool
22	Tucson Mitigation Corridor	Wildlife movement corridor	West of Tucson Mountain Wildlife Area, Pima County, AZ	Owned and managed by the Bureau of Reclamation in cooperation with the USFWS, Arizona Game and Fish Commission, and Pima County (funding by the Bureau of Reclamation)	2,514 acres, established to reduce impacts from the CAP on wildlife movements in the Avra Valley
23	Santa Cruz River Park	Public park	West of I-10, Tucson	Pima County and Regional Flood Control District-Pima County	469 acres, trails, play equipment
24	Robles Pass at Tucson Mountain Park	Public park	3500 West River Road, Tucson, AZ	Pima County	992 acres, mountain biking trails
25	La Mar Park	Public park	900 West Lincoln Street, Tucson, AZ	City of Tucson	3 acres, playground



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
26	Tucson Mountain Park	Public park	2451 West McCain Loop, Tucson, AZ	Pima County	19,308 acres, camping, trails, shooting range, overlook
27	John F. Kennedy Park	Public park	3700 South Mission Road, Tucson, AZ	City of Tucson	163 acres, pool, ballfields, play equipment
28	St. John's School Skate Park	Public park	602 West Ajo Way, Tucson, AZ	City of Tucson	4 acres, skate park
29	Julian Wash Greenway	Public trail	South side of Tucson, along and across I-10, Tucson, AZ	Pima County	14 miles, paved multi-use trail
30	Julian Wash Archaeological Park	Public park	2820 South 12th Avenue, Tucson, AZ	City of Tucson	16 acres, sculpture garden
31	El Paso and Southwestern Greenway (planned trail)	Planned trail	Former railroad corridor between downtown Tucson and Kino Sports Complex, South Tucson, AZ	City of Tucson	3 miles, planned multi-use historic interpretation and recreation trail
31a	Centro del Sur Community Center	Public park	1631 South 10th Avenue, Tucson, AZ	Pima County	0.3 acre, fitness center, community programs and social services
32	Vista del Pueblo Park	Public park	1800 West San Marcos Boulevard, Tucson, AZ	City of Tucson	2.8 acres, playground, open space
33	Ormsby Park	Public park	1401 South Verdugo Avenue, Tucson, AZ	City of Tucson	6 acres, ballfields, ball courts, playground, picnic area
34	Ochoa Park	Public park	3457 North Fairview Avenue, Tucson, AZ	City of Tucson	0.7 acre, ballfields, picnic area
35	Santa Rita Park	Public park	South 3rd Avenue, Tucson, AZ	City of Tucson	22 acres, ballfields, skate park
36	Tumamoc Hill Preserve	Nature preserve and National Historical Landmark	Off West Anklam Road, just west of North Silverbell Road, Pima County, AZ	University of Arizona	860 acres, site of the Desert Botanical Laboratory of the Carnegie Institution of Washington, prehistoric resources, natural resources conservation, public access



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
37	Sentinel Peak Park	Public park	1000 Sentinel Peak Road, South Tucson, AZ	City of Tucson	373 acres, mountaintop views, gazebo
38	Verdugo Park	Public park	South Verdugo Avenue, Tucson, AZ	City of Tucson	0.8 acre, playground
39	Santa Rosa Park	Public park	1055 South 10th Avenue, Tucson, AZ	City of Tucson	8 acres, ballfields, ball courts
40	Parque de Orlando y Diego Mendoza	Public park	18th Street and 8th Avenue, Tucson, AZ	City of Tucson	0.3 acre, memorial plaque, and seating
41	El Paso and Southwestern Greenway (existing trail)	Recreation trail	Former El Paso and Southwestern Railroad corridor, Tucson and South Tucson, AZ	City of Tucson	0.1 mile, multi-use path
42	El Parque de San Cosme	Public park	496 West Cushing Street, Tucson, AZ	City of Tucson	1 acre, gazebo and green space
43	Rosendo S. Perez Park	Public park	424 South Main Avenue, Tucson, AZ	City of Tucson	0.2 acre, fountain, mural
44	La Pilita	Public park	420 South Main Avenue, Tucson, AZ	City of Tucson	0.2 acre, adobe building adjacent to Rosendo S. Perez Park
45	El Tiradito Wishing Shrine	Public park	400 South Main Avenue, Tucson, AZ	City of Tucson	0.1 acre, shrine
46	Gethsemane Garden of Prayer	Public park	670 West Congress Street, Tucson, AZ	City of Tucson	1.3 acres, sculpture garden
47	La Placita Park	Public park	West Broadway near South Church Avenue, Tucson, AZ	City of Tucson	0.4 acre, park closed, according to the city website, as of July 2017
48	Veinte de Agosto Park	Public park	Congress Street and South Church Avenue, Tucson, AZ	City of Tucson	2 acres, park closed, according to the city website, as of July 2017



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
49	Bonita Park	Public park	20 North Bonita Avenue, Tucson, AZ	City of Tucson	1.4 acres, trail and green space along river
50	Sunset Park	Public park	255 West Alameda Street, Tucson, AZ	City of Tucson	1 acre, urban plaza, walkways, landscaping
51	El Presidio Park	Public park	160 West Alameda Street, Tucson, AZ	City of Tucson	2 acres, urban plaza, veterans' memorials, rose garden, fountain, sculptures
52	Jácome Plaza	Public park	101 North Stone Avenue, Tucson, AZ	City of Tucson	2 acres, walkways, landscaping, fountain, seating
53	Christopher Franklin Carroll Centennial Park	Public park	1 West Paseo Redondo, Tucson, AZ	City of Tucson	0.1 acre, path, seating, green space, plaques
54	Presidio San Augustin del Tucson	Public park	133 West Washington Street, Tucson, AZ	City of Tucson	0.8 acre, recreated 18th Century Spanish presidio
55	Alene Dunlap Smith Garden	Public park	355 North Granada Avenue, Tucson, AZ	City of Tucson	0.1 acre, sculpture garden
56, 57	David G. Herrera and Ramon Quiroz Park (formerly Oury Park)	Public park	600 West Saint Mary's Road, Tucson, AZ	City of Tucson	7 acres, Oury Recreation Center, softball fields, basketball court, walking path, picnic area, play equipment
58	Greasewood Park	Public park	1075 North Greasewood Road, Tucson, AZ	City of Tucson	152 acres, natural resources preservation and orienteering
59	Estevan Park	Public park	1001 North Main Avenue, Tucson, AZ	City of Tucson	8 acres, ballfields, ball courts, picnic area, playground
60	Feliz Paseos Park	Public park	1600 North Camino de Oeste, Tucson, AZ	Pima County	57 acres, environmental education, trails
61	Joaquin Murrieta Park	Public park	1400 North Silverbell Road, Tucson, AZ	City of Tucson	51 acres, ballfields



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
62	Francisco Elias Esquer Park	Public park	1331 North 14th Avenue, Tucson, AZ	City of Tucson	6 acres, playground, ramada
63	Manuel Valenzuela Alvarez Park	Public park	1945 North Calle Central, Tucson, AZ	City of Tucson	0.2 acre, playground
64	Saguaro National Park	Public park	3693 South Old Spanish Road, Tucson, AZ	NPS	91,327 acres total, including approximately 25,000 acres for Saguaro National Park West, historic and nature resource preservation, recreation. <i>Note that the proposed Saguaro National Park Boundary Expansion Act would increase Saguaro National Park West by approximately 1,152 acres on its east side.</i>
65	Juhan Park	Public park	1770 West Copper Street, Tucson, AZ	City of Tucson	15 acres, ballfields
66	Silverbell Golf Course	Public recreation facility	3600 North Silverbell Road, Tucson, AZ	City of Tucson	327 acres, golf course
67	Jacobs Park	Public park	3300 North Fairview Avenue, Tucson, AZ	City of Tucson	48 acres, ballfields, pool, picnic area, playground
68	Sweetwater Preserve	Wildlife preserve	4001 North Tortolita Road, Tucson, AZ	Pima County	891 acres of preserved land, multi-use trails
69	Sweetwater Wetlands Park	Water treatment facility with public access and education	Sweetwater Drive, Tucson, AZ	City of Tucson	58 acres, pathways, environmental education, nature observation, wastewater recharge
70	Christopher Columbus Park	Public park	4600 North Silverbell Road, Tucson, AZ	City of Tucson	277 acres, fishing lake, paths, dog park



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
70a	Rillito Regional Park	Public park	4502 North 1st Avenue, Tucson, AZ	Pima County	79 acres, horse track, picnic pavilions, playground, ballfields
71	Flowing Wells Park	Public park	5510 North Shannon Road, Tucson, AZ	Pima County	26 acres, ballfields, dog park, picnic areas, playgrounds
72	Dan Felix Memorial Park (formerly Peglar Wash Park)	Public park	5790 North Camino de la Tierra, Tucson, AZ	Pima County	40 acres, ballfields, trail
73	Pima Prickly Park	Public park	3500 West River Road, Tucson, AZ	Pima County	40 acres, paths, picnic areas
74	Rillito River Park	Public park	I-10 to North Craycroft Road along Rillito River, Tucson, AZ	Pima County	6 acres, linear park
74a	Camino de la Tierra Trailhead	Trail access point	North Camino de la Tierra, north of West Tres Nogales Road, Tucson, AZ	Pima County	9 acres, pedestrian/bicycle bridge over North Camino de la Tierra and connections to existing trails
75	Richardson Park	Public park	3535 West Green Trees Drive, Tucson, AZ	Pima County	4 acres, ballfields, picnic areas, playground, ball courts
76	Ted Walker Park	Public park	6751 North Casa Grande Highway, Marana, AZ	Pima County	71 acres, Mike Jacob Sports Park (ballfields, restrooms)
76a	Mike Jacob Sports Park	Public park	6901 North Casa Grande Highway, Tucson, AZ	Pima County	71 acres, ballfields, volleyball courts, playground, concessions
77	Ann Day Community Park (formerly Northwest Community Park)	Public park	7601 North Mona Lisa Road, Tucson, AZ	Pima County	21 acres, ballfields, dog park, trails, open space
78	Northwest YMCA Community Center	Recreation center	7770 North Shannon Road, Tucson, AZ	Pima County	14 acres, gymnasium, ball courts, exercise facilities, activity programs

Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
79	Cañada del Oro (Christina-Taylor Green Memorial River Park)	Public park	North Shannon Road at the Oro River, Tucson, AZ	Pima County	26 acres, riverside trail
80	Denny Dunn Park	Public park	4400 West Massingale Road, Tucson, AZ	Pima County	5 acres, ballfields, playground, picnic area
81	Crossroads at Silverbell District Park	Public park	7548 North Silverbell Road, Marana, AZ	Town of Marana	48 acres, ballfields, ball courts, picnic area, playgrounds, dog park
82	Continental Reserve Community Park	Public park	8568 North Continental Reserve Loop, Marana, AZ	Town of Marana	10 acres, ball court, picnic area, playground, path
82b	Cortaro Mesquite Bosque	Public park	Santa Cruz River, north of Twin Peaks Road, Marana, AZ	Pima County Regional Flood Control District	80 acres, wildlife habitat restoration, walking trails, wildlife viewing
82c	Los Morteros Conservation Area	Public park	9901 North El Uno Minor, Tucson, AZ	Pima County	232 acres, conservation land, trails and interpretive signage
83	Sunset Pointe Park	Public park	8535 North Star Grass Drive, Tucson, AZ	Pima County	4 acres, picnic area, playground, ballfield
84	El Rio Park	Public park	10160 North Blue Crossing Way, Marana, AZ	Town of Marana	3 acres, green space, ball court, ramada
84a	El Rio Preserve	Public park	10190 North Coachline Boulevard, Tucson, AZ	Town of Marana	104 acres, off-street parking, shade structure, wildlife viewing deck, sitting area, walking path
85	Rillito Vista Neighborhood Park	Public park	8820 West Robinson Street, Rillito, AZ	Pima County	2 acres, ball courts, playground, picnic area
86	Santa Cruz River Park	Public park	North of El Rio, Tucson, AZ	City of Tucson	10 acres, disc golf course, trails



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
87	Ora Mae Harn Park	Public park	13250 North Lon Adams Road, Marana, AZ	Town of Marana	35 acres, ballfields, ball courts, picnic areas, playgrounds, community center
88	Tortolita Preserve	Public park	North Dove Mountain Road, Marana, AZ	Town of Marana	2,400 acres of preserved land for wildlife habitat, trails
89	San Lucas Community Park	Public park	14040 North Adonis Road, Marana, AZ	Town of Marana	13 acres, ballfields, ball courts, picnic areas, playgrounds, dog park
90	Anza Trail Park	Public park	North Trico Road, along Santa Cruz River near Pinal County border, Marana, AZ	Pima County	228 acres, off-street parking, shade structure, passive recreation
90a	Segment of Tortolita CAP Trail	Planned recreation trail	North from West Tangerine Road along canal to South County Line Road, Marana, AZ	Pima County	7.8 miles of planned multi-use trail
Pinal County					
91	Picacho Peak State Park	Public park	15520 Picacho Peak Road, Picacho, AZ	Arizona State Parks	3,461 acres, Visitor Center, picnic areas, shelter, camping areas, rest rooms
92	West Pinal (Kortsen) Park	Community park	50801 West Highway 84, adjacent to Route 8, Stanfield, AZ	Pinal County	123 acres, camping, picnicking, trails
93	Palo Verde Regional Park (Pinal County Parks)	Public recreation land	Eastern edge of Sonoran Desert National Monument at western county border, between SR 238 and I-8, Pinal County, AZ	Pinal County	22,810 acres of the Monument's 12.2 million acres; picnic and play areas, camping, shooting and other sports, motorized and non-motorized trails



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
94	Butterfield Pass Trail segment	Recreation trail	Sonoran Desert National Monument near Maricopa Mountain Pass, known as the Butterfield Pass Trail Junction off Highway 238; co-aligned with Mormon Battalion Trail route, Gila Pioneer Route, and De Anza trail route, Maricopa County, AZ	BLM	31 acres, 4-wheel drive and hiking route; BLM kiosk off Highway 238, historic markers for Butterfield Pass and Mormon Battalion Trail routes
95	Arlington Wildlife Area	State Wildlife Area, wildlife refuge	West bank of Gila River, 3.5 miles south of Arlington and 15 miles southwest of Buckeye, Maricopa County, AZ	Arizona Game and Fish Commission and other agencies	2,574 acres, wildlife habitat area, public access for hunting and fishing
96	Powers Butte Wildlife Area	State Wildlife Area, wildlife refuge	East side of Gila River, 20 miles north of Gila Bend, Maricopa County, AZ	Arizona Game and Fish Commission and other agencies	1,947 acres, wildlife habitat preservation (riparian and aquatic habitat)
Maricopa County					
97	Buckeye Hills Regional Park	Public park	26700 West Buckeye Hills Drive, Buckeye, AZ	Maricopa County	4,648 acres, park, restrooms
97a	Maricopa Trail (Existing route)	Recreation trail	26700 West Buckeye Hills Drive, Buckeye, AZ	Maricopa County	Existing route of 242-mile loop trail that accesses Buckeye Hills Regional Park
97b	Maricopa Trail (Planned route)	Recreation trail	26700 West Buckeye Hills Drive, Buckeye, AZ	Maricopa County	Final route of 242-mile loop trail that accesses Buckeye Hills Regional Park
98	Robbins Butte Wildlife Area	State Wildlife Area, wildlife refuge	Both sides of SR 85, 7 miles south of Buckeye, AZ	Arizona Game and Fish Department and other agencies	5,676 acres, wildlife habitat preservation (food and nesting habitat for game birds; enhancing riparian habitat) and interpretation (170 acres under jurisdiction of 1954 Public Land Order)



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
98a	1954 Public Land Order 1015 Lands and adjacent AGFD parcels	Wildlife refuge	Lower Gila River Wildlife area	Owned by USFWS; managed by Arizona Game and Fish Department	Multiple, undeveloped Public Land Order 1015 parcels are designated as "Coordination areas" under the National Wildlife Refuge Act; adjacent AGFD parcels are those that were purchased in furtherance of the Department of the Interior/AGFD Cooperative Agreement from 1954, clause 7.
99	Sonoran Foothills Community Park	Public park	12795 South Estrella Parkway, Goodyear, AZ	Town of Goodyear	18 acres, ballfields, picnic tables and barbeque grills, amphitheater, concessions, walking path
100	White Tank Mountain Regional Park	Public park	20304 West White Tank Mountain Road, Waddell, AZ	Maricopa County	29,200 acres, nature center, picnicking, hiking, biking, horseback riding, camping
100a	Skyline Regional Park	Public park and preserved land	2600 North Watson Road, Buckeye, AZ	BLM owned; managed by City of Buckeye	7,700 acres, trails, campsites, interpretive programs



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
101	Vulture Mine RMZ	Recreation areas within larger BLM land holding to be developed	South of US 60, Wickenburg, AZ	BLM	70,452 acres, hiking and off-highway vehicle trails, picnic and camping areas; master-planned amenities include multi-use trails, motorized uses, equestrian uses, picnicking, camping, day use, archery, interpretive/educational uses, wildlife and nature viewing, historical interpretation, hunting, geocaching, and other miscellaneous uses; county-planned recreation areas in a proposed lease area; contains a designated multi-use corridor that allows for non-conservation uses
102	Hassayampa River Preserve	Nature preserve with public access	West side of US 60 from North Garden City Road to North 100th Avenue, Maricopa County, AZ	The Nature Conservancy in partnership with Maricopa County Parks and Recreation Department	770 acres, nature preserve (planned component of Vulture Mine RMZ with public access for hiking, walking, wildlife viewing), the Nature Conservancy to place conservation easement to protect natural values.
103	Wishing Well Park	Public park	Wickenburg Way at US 60/US 93 roundabout, Wickenburg, AZ	Town of Wickenburg	1 acre, wishing well, Hassayampa River Walk pedestrian bridge, event facility
104	Hassayampa River Walk	Public park	Bridge over Hassayampa River at US 60/US 93 roundabout, Wickenburg, AZ	Town of Wickenburg	1 acre, pedestrian, bicycle, and event facility
105	Coffinger Park	Public park	Tegner Street at Swilling Avenue (west side of US 93), Wickenburg, AZ	Town of Wickenburg	13.6 acres, pool, skate park, recreation building, tennis courts, play equipment, walking path



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
106	Constellation Park	Public park	1201 Constellation Road (east side of US 93), Wickenburg, AZ	Town of Wickenburg	311 acres, campgrounds, rodeo grounds, shooting range
Yavapai County					
	None found				

1 SOURCE: Online information obtained from websites provided by federal (BLM, Bureau of Reclamation, USDA, USFWS, USFS, and NPS), state (Arizona Game and Fish Commission
2 and Arizona State Parks), county (Pima, Pinal, Maricopa, Santa Cruz, and Yavapai) and municipal (City of Buckeye, Town of Goodyear, City of Nogales, Town of Sahuarita, Town of
3 Marana, City of Tucson, and Town of Wickenburg) agencies with jurisdiction as well as by The Nature Conservancy. Accessed June and July 2017. Property acreages are based on
4 GIS shapefiles and data available at the time of study.
5
6

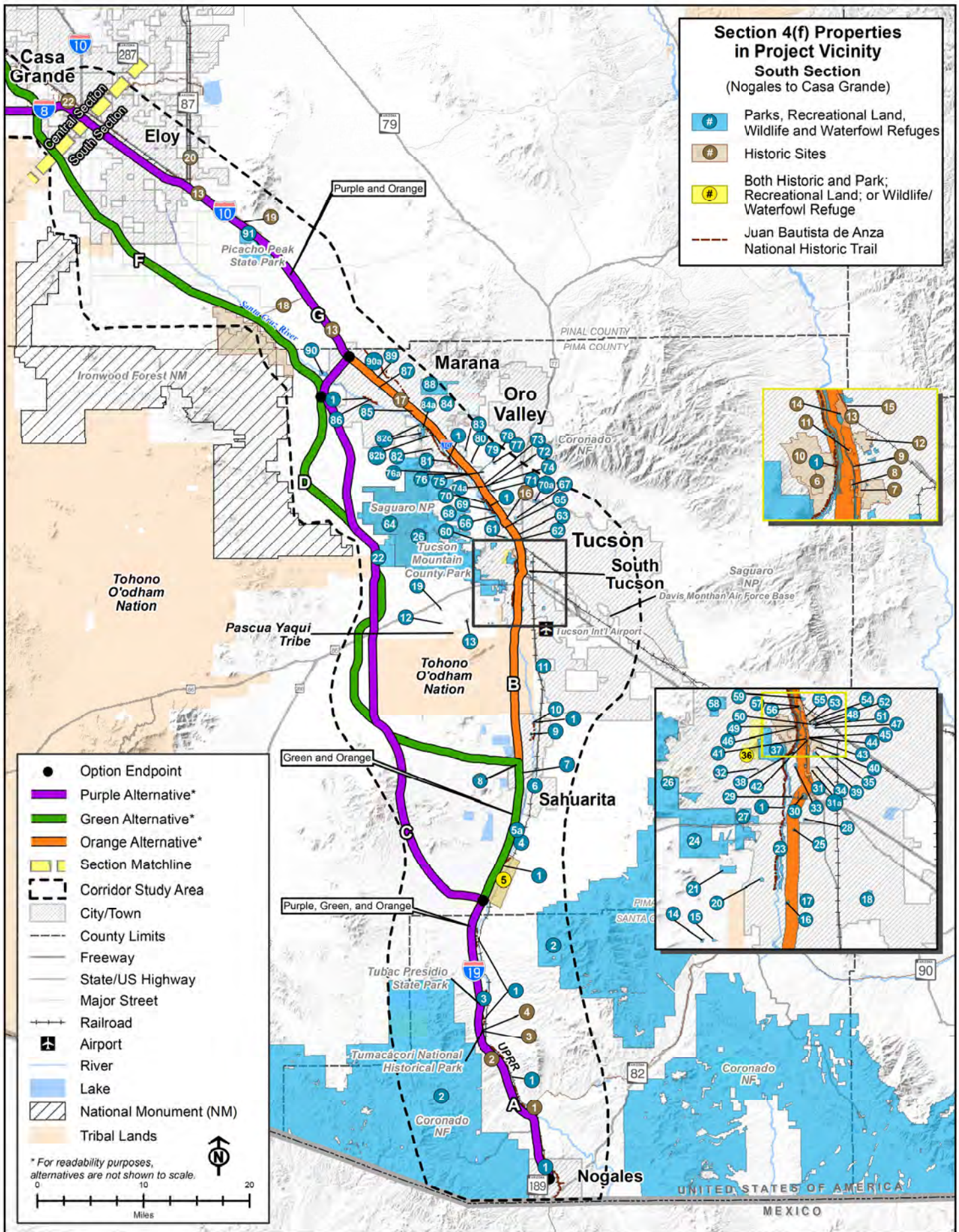


Figure 4-6. Section 4(f) Properties in the Corridor Study Area - Purple, Green, and Orange Alternatives - South Section

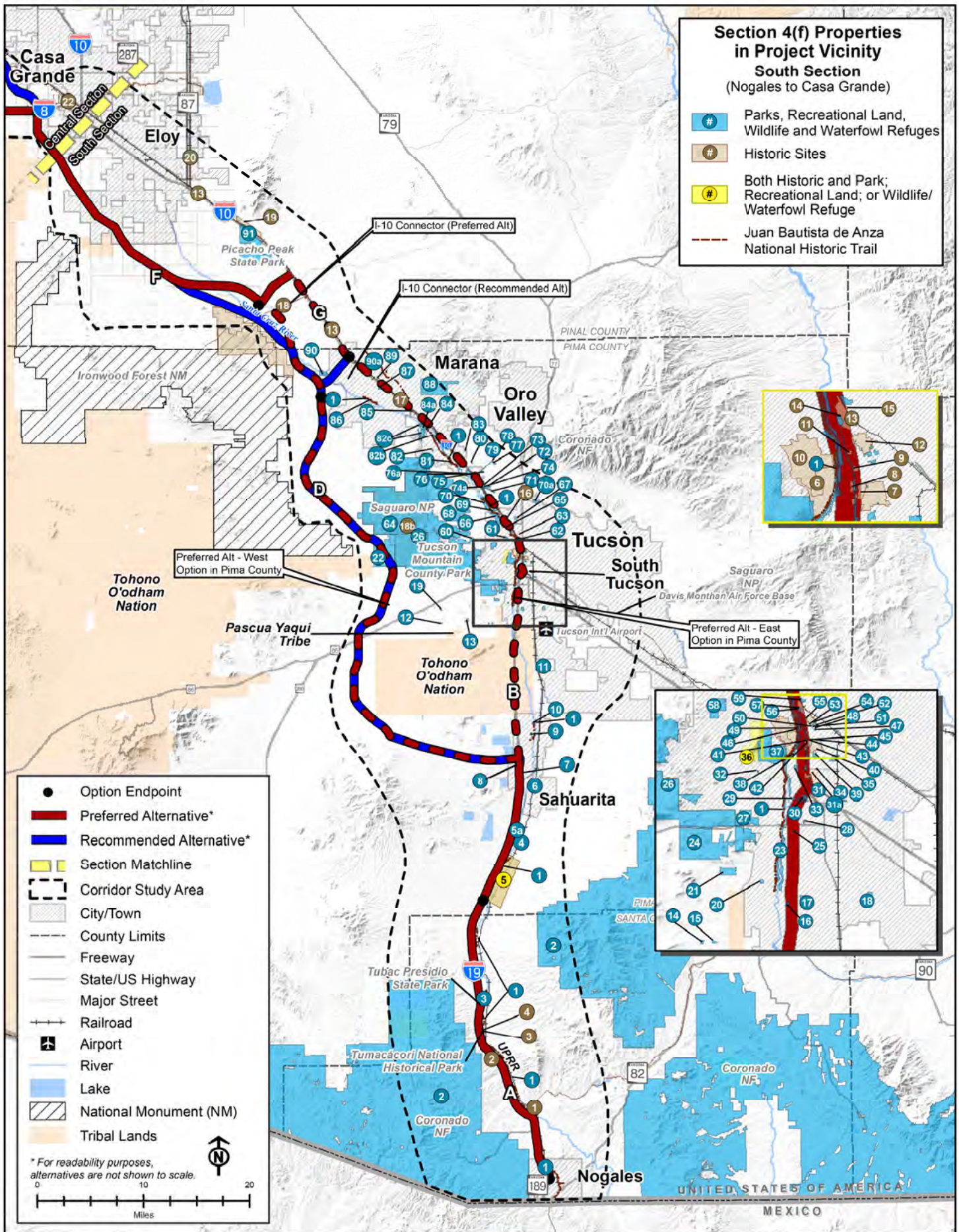


Figure 4-7. Section 4(f) Properties in the Corridor Study Area - Recommended and Preferred Alternatives - South Section

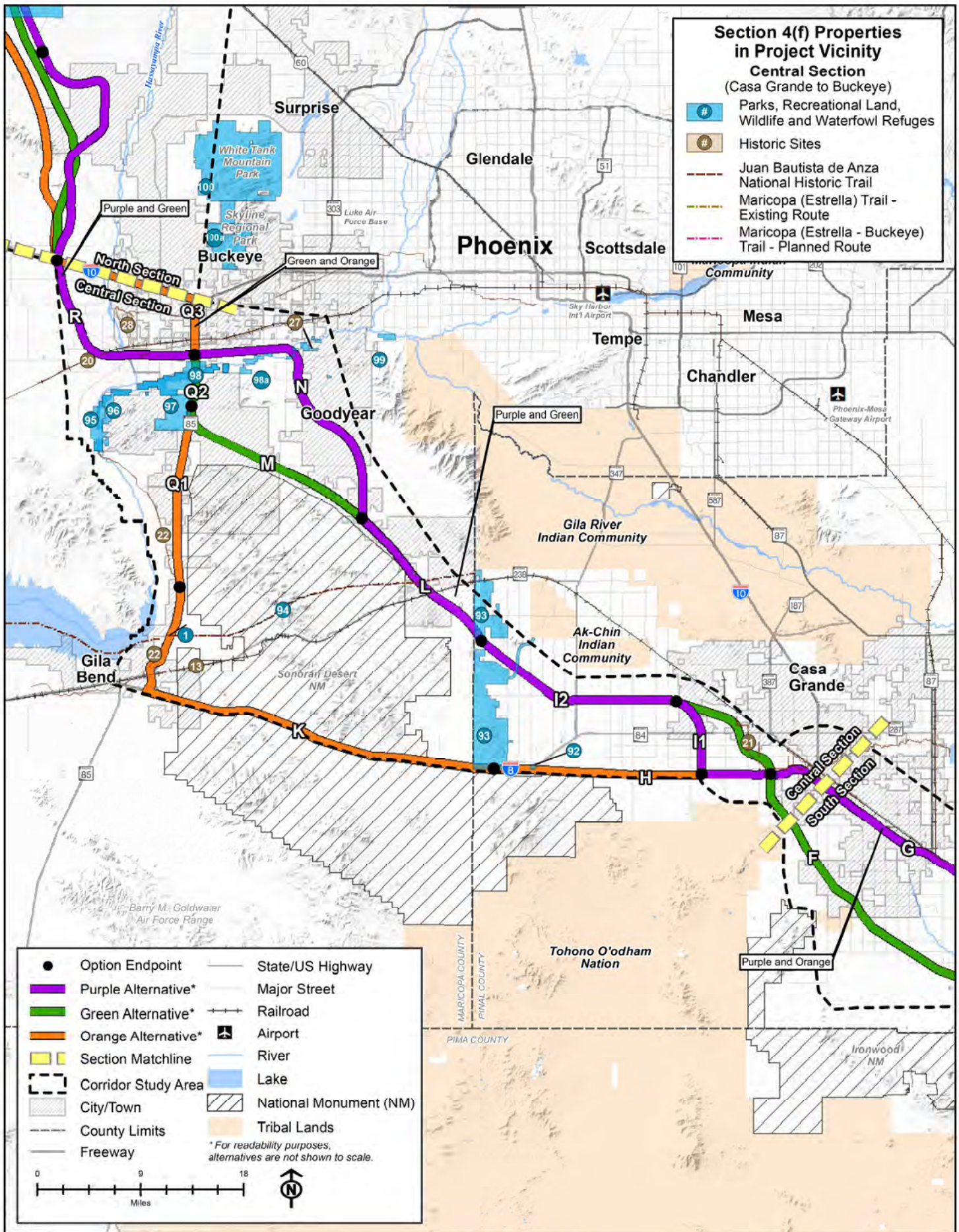


Figure 4-8. Section 4(f) Properties in the Corridor Study Area - Purple, Green, and Orange Alternatives - Central Section

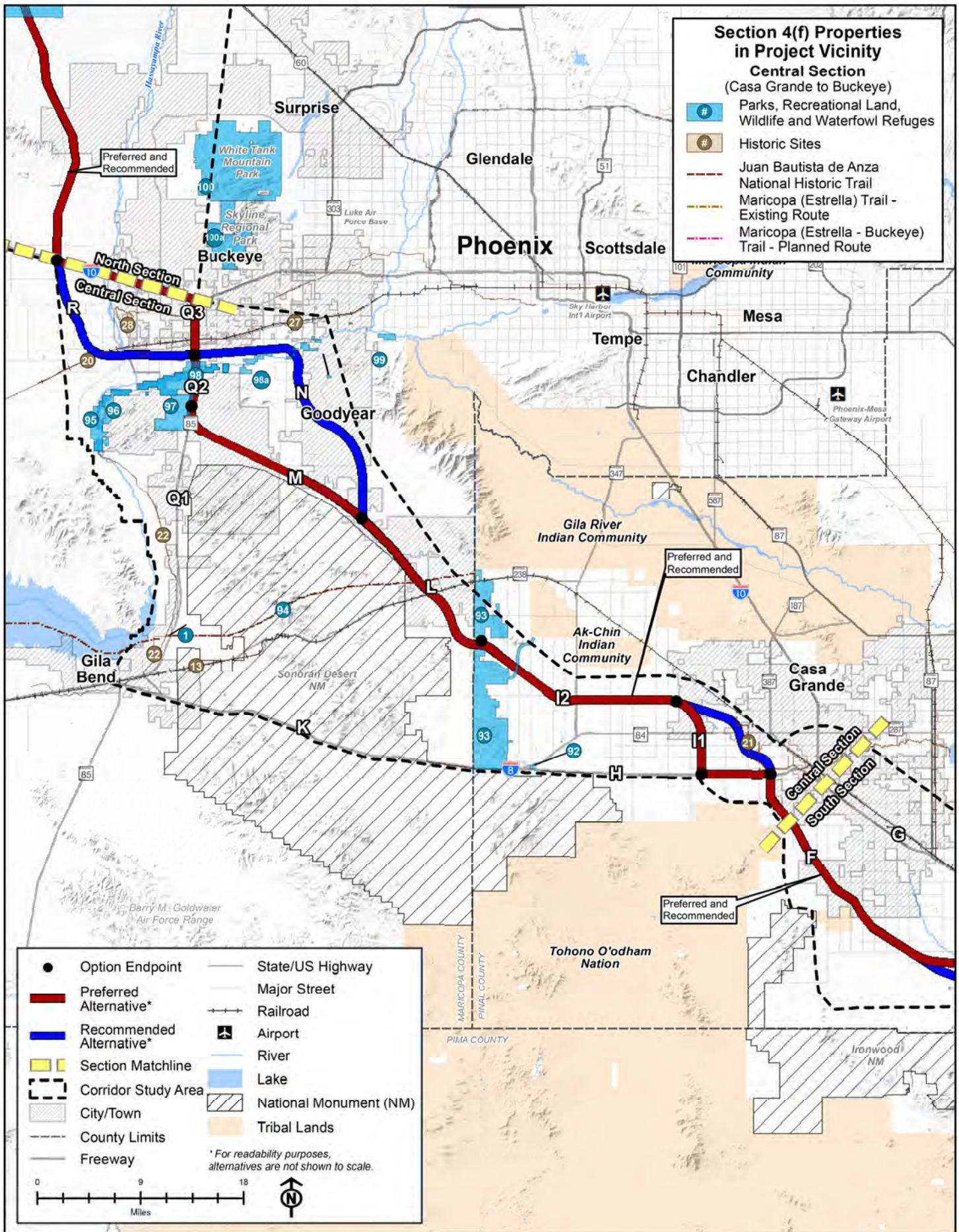


Figure 4-9. Section 4(f) Properties in the Corridor Study Area - Recommended and Preferred Alternatives - Central Section

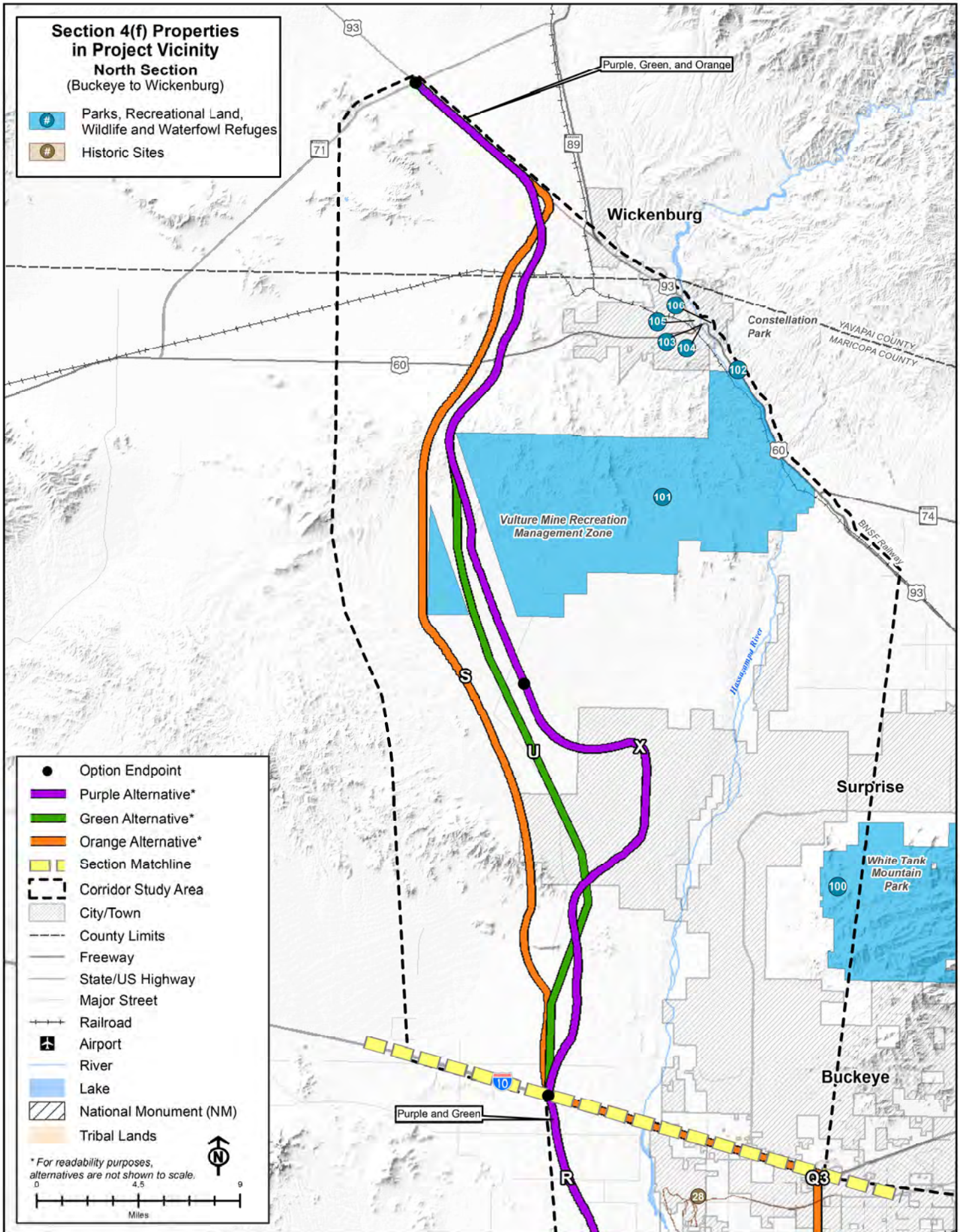


Figure 4-10. Section 4(f) Properties in the Corridor Study Area - Purple, Green, and Orange Alternatives - North Section

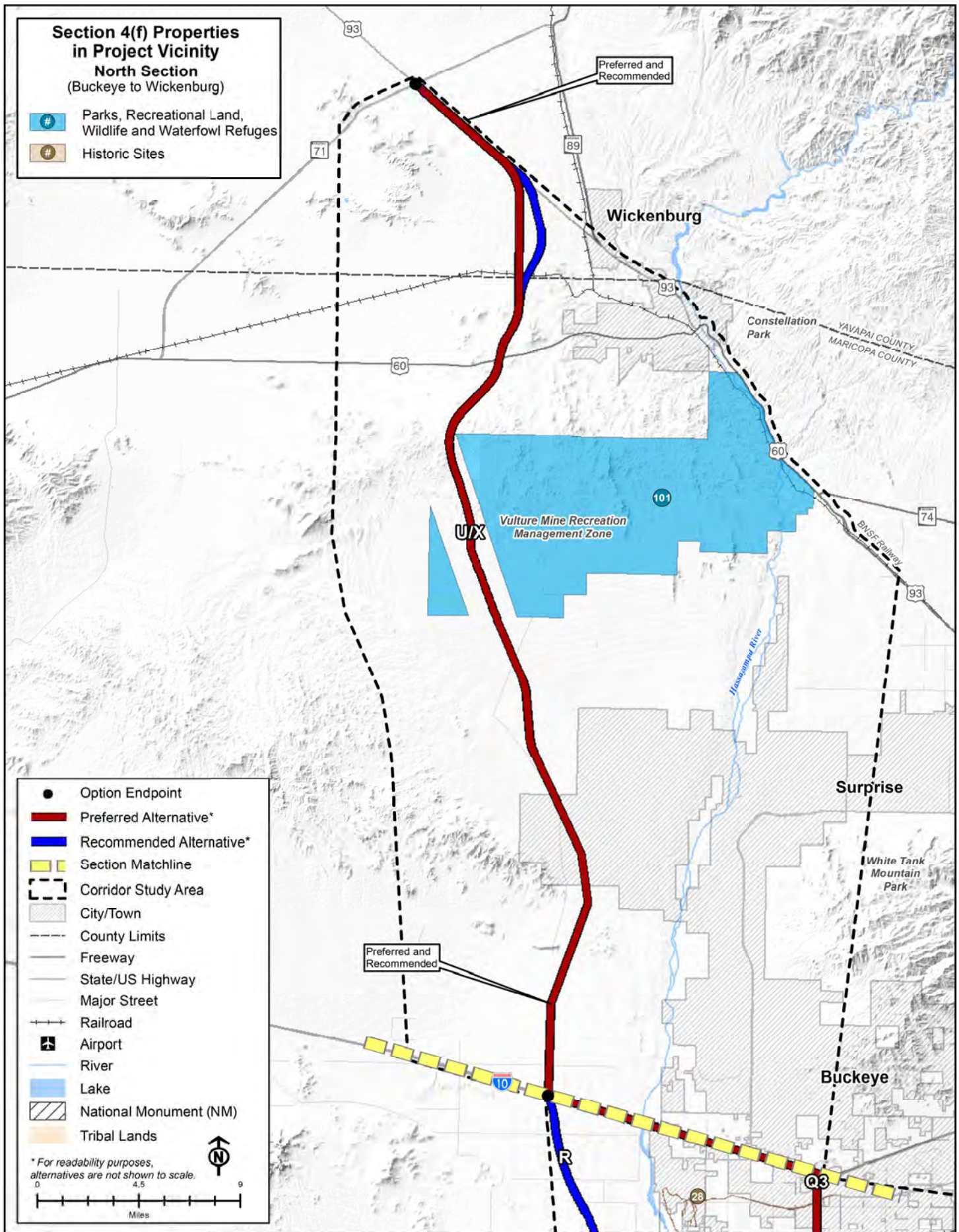


Figure 4-11. Section 4(f) Properties in the Corridor Study Area - Recommended and Preferred Alternatives - North Section



1 **4.5.1.1 Properties Preliminarily Determined not Protected by Section 4(f)**

2 **Santa Rita Experimental Range and Wildlife Area**

3 A memorandum providing a preliminary evaluation of wildlife areas is in **Appendix F1**
4 (Applicability of Identified Wildlife Areas as Section 4(f) Properties for the I-11 Tier 1 EIS).
5 According to the memorandum, the primary purpose of the property is for research. Since the
6 purpose is not a public park, recreation area, or wildlife or waterfowl refuge, FHWA preliminarily
7 determined that the Santa Rita Experimental Range and Wildlife Area does not qualify for
8 protection under Section 4(f).

9 **Marana Mortuary and Cemetery**

10 Marana Mortuary and Cemetery is a privately owned cemetery at 12146 West Barnett Road in
11 Marana. Pima County Assessor's records indicate the cemetery is owned by Marana Mortuary
12 & Cemetery Properties LLC. FHWA's *Section 4(f) Policy Paper* states that Section 4(f) only
13 applies to cemeteries if they are determined to be listed in or eligible for listing in the NRHP as
14 historic sites deriving significance from association with historic events, from age, from the
15 presence of graves of persons of transcendent importance, or from distinctive design features
16 (FHWA 2012b). County Assessor data and historical aerial photographs indicate that the
17 cemetery was established in 2010 and is less than a decade old. Because the cemetery is not
18 listed in or eligible for listing in the NRHP, it is not a historic site and does not require
19 consideration under Section 4(f).

20 **Marana Mound**

21 Marana Mound is a large prehistoric Hohokam archaeological site within the Villages of Tortolita
22 development/Marana Mound (AZ AA:12:251). The AZSITE database indicates it is NRHP
23 eligible but does not indicate under which criterion; almost certainly Criterion D for its potential
24 to yield important information. Developers have preserved parts of such sites—often to avoid
25 the costs of expensive data recovery if required by regulations—but they also then designate
26 such “set asides” as “green space” for the community they are developing, which might become
27 recreational properties. There are no indications at this time that the Marana Mound has been
28 set aside among new housing. It is likely that the Marana Mound is in private ownership and not
29 publicly interpreted or made available as a recreational facility at this time. FHWA preliminarily
30 determined that the site is not protected by Section 4(f) because of its eligibility as a historic site
31 under NRHP Criterion D and suspected private ownership, which eliminates the site from being
32 protected as a park.

33 **Arizona Veterans' Memorial Cemetery-Marana**

34 Arizona Veterans' Memorial Cemetery-Marana is located on Luckett Road just south of the Pinal
35 County line and within the I-10 connector on the Recommended Alternative. Pima County
36 Assessor's records indicate the cemetery is owned by the State of Arizona. FHWA's *Section 4(f)*
37 *Policy Paper* states that Section 4(f) only applies to cemeteries if they are determined to be
38 listed in or eligible for listing in the NRHP as historic sites deriving significance from association
39 with historic events, from age, from the presence of graves of persons of transcendent
40 importance, or from distinctive design features (FHWA 2012b). The Veterans' Cemetery
41 (Arizona Department of Veterans' Services, [https://dvs.az.gov/arizona-veterans-memorial-](https://dvs.az.gov/arizona-veterans-memorial-cemetery-marana)
42 [cemetery-marana](https://dvs.az.gov/arizona-veterans-memorial-cemetery-marana), accessed 2019), was dedicated in 2016, and Google imagery indicates this
43 cemetery was developed only about 5 years ago. Because the cemetery is not listed in or

1 eligible for listing in the NRHP, it is not a historic site and does not require consideration under
 2 Section 4(f).

3 **Ironwood Forest National Monument**

4 The publicly owned portions of this property, which are managed by BLM, are accessible to the
 5 public. The property was designated in 2000 by Presidential Proclamation 7320 for the
 6 protection and management of “historic landmarks, historic and prehistoric structures, and other
 7 objects of historic or scientific interest.” This formal designation serves as the definition of the
 8 primary purpose of the property as a whole. Within the BLM’s *Ironwood Forest National*
 9 *Monument, Record of Decision and Approved Resource Management Plan* (BLM 2013), the
 10 agency states that other, secondary uses (e.g., recreation, timbering, and rangeland) may be
 11 allowed under specific criteria so that the primary purpose of the property is supported.
 12 However, these other secondary uses are not relevant to the Section 4(f) test of primary
 13 purpose.

14 As explained in FHWA’s *Section 4(f) Policy Paper*, Question 1A, to be protected under Section
 15 4(f), land must be formally designated as a park, recreation area, wildlife and waterfowl refuge,
 16 or historic site (23 CFR 774.17) (FHWA 2012b). FHWA interprets formal designation as
 17 meaning that the land has been identified through an official process, such as a Presidential or
 18 legislative action, or is included in an adopted master plan by the official with jurisdiction over
 19 the property. As part of the formal designation, the primary purpose and function of the land is
 20 identified. Referring again to FHWA’s *Section 4(f) Policy Paper*, Question 1A, primary purpose
 21 is related to the land’s primary function and how it is intended to be managed. Incidental,
 22 secondary, occasional, or dispersed activities that are similar to park, recreational, or refuge
 23 activities do not constitute a primary purpose within the context of Section 4(f) (FHWA 2012b).
 24 Determining the primary purpose of land is also important because the criteria for assessing use
 25 of a Section 4(f) property differs depending on whether the land is formally designated as a
 26 park, recreation area, wildlife or waterfowl refuge, or historic site.

27 BLM also designated the Ironwood Forest National Monument as a Special Recreation
 28 Management Area. The Special Recreation Management Area is a management tool that allows
 29 BLM to plan and implement recreation activities in a manner that ensures the primary purpose
 30 of the property is protected. While the Special Recreation Management Area, in addition to the
 31 *Resource Management Plan*, is an important planning tool for BLM to balance the needs of and
 32 demands upon multiple resources on the property, the Special Recreation Management Area is
 33 not the source for the original, formal designation of the property, and therefore, is not the
 34 source of the primary purpose of the property as defined by Section 4(f).

35 On the basis of these Section 4(f) tests, FHWA assessed that, although Ironwood Forest
 36 National Monument contains publicly owned land that is open to the public, the primary purpose
 37 of the Ironwood Forest National Monument is not a park, recreation area, wildlife or waterfowl
 38 refuge, or historic site as defined by Section 4(f). Thus, FHWA preliminarily determined that
 39 Ironwood Forest National Monument is not protected under Section 4(f).

40 **Tucson Mountain Wildlife Area**

41 FHWA assessed that Tucson Mountain Wildlife Area is a mix of publicly owned properties that
 42 are open to the public and privately owned properties that are not open to the public. Only the
 43 properties that are publicly owned and open to the public have the potential to be protected by
 44 Section 4(f). Examples of such properties within the Tucson Mountain Wildlife Area are Tucson

1 Mountain Park, Saguaro National Park, and Tucson Mitigation Corridor, which are protected by
2 Section 4(f). Because privately owned land that is not open to the public is not protected by
3 Section 4(f), the Tucson Mountain Wildlife Area, being a grouping of publicly owned and
4 privately owned lands, is not protected by Section 4(f).

5 **Sonoran Desert National Monument**

6 The Sonoran Desert National Monument is publicly owned property that is open to the public
7 and managed by BLM. The Sonoran Desert National Monument objects include plant and
8 animal resources as well as historical and archaeological resources. The Sonoran Desert
9 National Monument was designated in 2001 by Presidential Proclamation 7397 for the
10 protection and management of objects of natural and cultural interest within the property. This
11 formal designation serves as the definition of the primary purpose of the property as a whole.
12 BLM's *Sonoran Desert National Monument Record of Decision and Approved Resource*
13 *Management Plan* (BLM 2012) specifically states that the Proclamation is the principal direction
14 for management of the property; all other considerations are secondary to that edict. The RMP
15 empowers BLM to balance the availability and function of all resources within the Sonoran
16 Desert National Monument for multiple uses. Within the RMP, BLM identifies other, secondary
17 uses (including recreation) that may be allowed under specific criteria so that the primary
18 purpose of the property is supported. However, based on this information, FHWA assesses that
19 recreation as a secondary use is not relevant to the Section 4(f) test of primary purpose; the
20 Sonoran Desert National Monument is not protected by Section 4(f). Historic and recreation
21 resources within the monument are protected by Section 4(f).

22 **Sahuarita Property (northwest quadrant of West Twin Buttes Road and the canal,**
23 **Sahuarita, AZ)**

24 According to FHWA's *Section 4(f) Policy Paper*, Question 1, Section 4(f) regulations require that
25 a property must be officially designated as a park, recreation area, or wildlife or waterfowl refuge
26 by the official with jurisdiction over the property for the property to be considered for protection
27 by Section 4(f) (FHWA 2012b). Question 25 further states that evidence of formal designation
28 would be inclusion of the property in a municipal master plan. The Town of Sahuarita acquired
29 the 96-acre property in 2019, but has not formally designated the property for a specific use,
30 such as a park, and has not included the property in the Town's adopted plan. For these
31 reasons, FHWA preliminarily determined that the Sahuarita property does not qualify for
32 protection under Section 4(f) at this time. However, on October 9, 2020, the Town of Sahuarita
33 agreed to contact and coordinate with ADOT when the time comes for the Town to plan and
34 formally designate the property (**Appendix F3** [Correspondence Related to Preliminary Section
35 4(f) Evaluation]). At that time, and if the Town designates the property as a park, ADOT and the
36 Town could pursue joint planning under Section 4(f). Joint planning is a term used to describe a
37 condition in which Section 4(f) does not apply and is detailed in 23 CFR 774.11(i), which states:

38 (i) When a property is formally reserved for a future transportation facility before or at
39 the same time a park, recreation area, or wildlife and waterfowl refuge is established,
40 and concurrent or joint planning or development of the transportation facility and the
41 Section 4(f) resource occurs, then any resulting impacts of the transportation facility will
42 not be considered a use as defined in § 774.17... (2) Concurrent or joint planning or
43 development can be demonstrated by a document of public record created after,
44 contemporaneously with, or prior to the establishment of the Section 4(f) property.
45 Examples of an adequate document to demonstrate concurrent or joint planning or
46 development include: (i) A document of public record that describes or depicts the



1 designation or donation of the property for both the potential transportation facility and
2 the Section 4(f) property; or (ii) A map of public record, memorandum, planning
3 document, report, or correspondence that describes or depicts action taken with respect
4 to the property by two or more governmental agencies with jurisdiction for the potential
5 transportation facility and the Section 4(f) property, in consultation with each other."

6 Joint planning of the I-11 corridor project and the potential future park would prevent the
7 construction of I-11 within the park boundaries from being considered a use under Section 4(f).

8 **4.5.1.2 Properties Potentially Protected by Section 4(f)**

9 The following properties were identified by Pima County during the Draft Tier 1 EIS public
10 comment period as potentially being protected by Section 4(f). ADOT will consult further with
11 Pima County during Tier 2 studies to determine which properties are protected by Section 4(f)
12 and to complete a Section 4(f) evaluation for protected properties.

- Avra Valley Wildlife Corridor
- CAVSARP mitigation land
- Cortaro-Hartman donation
- Diamond Bell Ranch mitigation land
- Brawley Wash-Twin Peaks flood prevention land
- Los Robles Wash – Trico Wash mitigation land
- Red Point Cascada donation land
- Valencia conservation land
- Wexler property

13 **4.5.2 Historic Sites**

14 Historic sites (including historic properties and archaeological sites) are identified and discussed
15 in **Section 3.7** (Archaeological, Historical, Architectural, and Cultural Resources) of the Final
16 Tier 1 EIS. The sites include those properties that have been (1) previously determined eligible
17 for listing by others or (2) are already listed on the NRHP. **Table 4-2** lists the historic properties
18 within the 2,000-foot-wide Build Corridor Alternatives from south to north. **Figure 4-6** through
19 **Figure 4-11** show the location of each property in relation to the Build Corridor Alternatives.

20 Potentially eligible sites were not considered in the Tier 1 level of evaluation but would be
21 considered during Tier 2. During Tier 2 studies, the 2,000-foot-wide corridor of a selected Build
22 Corridor Alternative will be refined to a specific roadway alignment. At that time, historic and
23 archaeological resources will be surveyed, Section 106 consultation will be undertaken, and a
24 Final Section 4(f) Evaluation will be conducted. The findings of this revised Draft Preliminary
25 Section 4(f) Evaluation could be refined during Tier 2 if additional historic and/or archaeological
26 resources are identified at that time. Tier 2 activities will include examination of means to avoid,
27 mitigate, and/or minimize harm to protected resources.

28



1 **Table 4-2. Historic Sites in the Corridor Study Area**

Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
Multiple Counties					
13	Southern Pacific Railroad (now Union Pacific), including Phoenix Main Line, AZ A:2:40(ASM)	Historic railroad corridor (1865-1988)	Maricopa, Pinal, and Pima Counties	SHPO	111 miles, some segments were determined NRHP-eligible, Criterion A for association with the expansion of rail travel
18	Arizona Southern Railroad – railroad grade, AZ AA:10:19(ASM)	Historic railroad corridor (1904-1933)	Maricopa, Pinal, and Pima Counties	SHPO	17 miles, some segments were determined NRHP-eligible, Criterion A for association with the movement of mined materials
Santa Cruz County					
1	New Mexico and Arizona Railroad: Nogales Branch, AZ EE:4:43(ASM)	Railroad	City of Nogales, AZ	SHPO	340 acres, historic railroad property in active use; NRHP-eligible, Criterion A for significance in railroad development
2	Otero Cemetery near Palo Parado/I-19 interchange, AZ DD:8:165(ASM)	Historic site	Tubac, AZ	SHPO	0.2 acre, NRHP-eligible, Criterion A and Criterion B for significant contribution to area settlement history
3, 4	Tumacácori National Monument and Museum (Tumacácori National Historic Park)	Historic site (three 17th and 18th Century missions and museum complex)	1895 East Frontage Road, Tumacácori, AZ 85640	NPS	360 acres, historical and natural resources conservation and interpretation; National Historical Landmark-listed in 1987, Criterion A for association with Spanish Colonial Jesuit mission period (17th and 18th Centuries) and Criterion C for Mission and Spanish Colonial architecture



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
Pima County					
5	Canoa Ranch Rural Historic District (Hacienda de la Canoa, Raul M. Grijalva Canoa Ranch Conservation Park)	Historic site (1912-1951) and recreation area	5375 South I-19 Frontage Road, Green Valley, AZ	SHPO	4,950 acres, NRHP-listed in 2016, Criterion A for association with cattle ranching in AZ and Criterion C for cluster of features associated with the headquarters of an early ranching and agriculture operation
6	San Agustin del Tucson Mission site, AZ BB:13:6(ASM)	Homestead	City of Tucson, AZ	SHPO	194 acres, reconstructed wall, garden; NRHP-eligible, Criterion A for significance as mission settlement
38	Tumamoc Hill Preserve	National Historical Landmark and nature preserve	Off West Anklam Road, just west of North Silverbell Road, Pima County, AZ	University of Arizona	860 acres, site of the Desert Botanical Laboratory of the Carnegie Institution of Washington, prehistoric resources, natural resources conservation, public access
7	Barrio El Hoyo Historic District	Historic neighborhood (1908-1950)	Bounded by West Cushing Street, West 18th Street, South 11th Avenue, and South Samaniego Avenue, Tucson, AZ	SHPO	15 acres, NRHP-listed in 2008, Criterion A as an early garden neighborhood along the Santa Cruz River, Criterion C for its collection of residential structures built from 1908 to 1950 in the Sonoran style
8	Barrio El Membrillo Historic District	Historic neighborhood (1920s)	Bounded by West Granada Street, West Simpson Street, and right-of-way of former El Paso and Southwestern Railroad corridor, Tucson, AZ	SHPO	6 acres, NRHP-listed in 2009, Criterion A as a historic Hispanic neighborhood along the Santa Cruz River, Criterion C for its collection of residential structures built in the 1920s in the Sonoran style



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
9	El Paso and Southwestern Railroad District	Historic linear corridor (1913), with a depot, a roundhouse, a yard office building, a livestock exchange building, and four bridges	419 West Congress Street, Tucson, AZ	SHPO	49-acre corridor, including railroad grade, depot building and roundhouse; District was determined eligible under Criterion A for association with railroad transportation and mining; Depot was NRHP-listed in 2004, Criterion A (same as District) and Criterion C for its Classical Revival style.
10	Menlo Park Historic District	Historic neighborhood (1877–1964)	Bounded around intersection of Grande Avenue and West Congress Street, Tucson, AZ	SHPO	232 acres, NRHP-listed in 2010, Criterion A as an Anglo-European/American neighborhood, Criterion C for its mix of Spanish Colonial Revival, Craftsman bungalow, prairie, post-World War II ranch, and Mid-Century Modern architectural styles
11	Levi H. Manning House	Historic site (1908)	9 Paseo Redondo, Tucson, AZ (in El Presidio Historic District)	SHPO	3 acres, NRHP-listed in 1979, Criterion C for its combination of southwestern styles and association with former Tucson Mayor Levi Manning and architect Henry Trost
12	El Presidio Historic District	Historic neighborhood (1860–1920)	Bounded by West 6th and West Alameda Streets, and North Stone and Granada Avenues, Tucson, AZ	SHPO	42 acres, NRHP-listed in 1976, Criterion A as originally an 18th Century Spanish village; subsequent Mexican village; Criterion C for architecture in Sonoran, Transitional, American Territorial, Mission Revival, and Craftsman Bungalow styles



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
14	Barrio Anita Historic District	Historic neighborhood (1903)	Bounded by West Speedway Boulevard, Union Pacific Railroad, North Granada Avenue, and St. Mary's Road	SHPO	37 acres, NRHP-listed in 2011; Criterion A began as a Hispanic barrio in 1920, named after Annie Hughes, sister of Sam Hughes; Criterion C for architecture in Sonoran, Territorial, and Queen Anne styles
15	Ronstadt-Sims Adobe Warehouse	Historic site (1920)	911 North 13th Avenue, Tucson, AZ	SHPO	0.2 acre, NRHP-listed in 1989, Criterion A for agricultural association, Criterion C for post-railroad Sonoran style and engineering technology; non-contiguous contributor to John Spring Neighborhood District and John Spring Multiple Resource Area
16	USDA Tucson Plant Materials Center	Historic site (1934)	3241 North Romero Road, Tucson, AZ	SHPO	8 acres, NRHP-listed in 1997, Criterion A for its operation as a producer of nursery stock and seeds for regional soil stabilization and conservation projects
17	Cortaro Farms Canal/Cortaro-Marana Irrigation District Canal	Historic water conduit (1920)	Town of Marana, AZ	SHPO	12 miles, NRHP-eligible, Criterion A for its significant contribution to the expansion of irrigated agriculture in the region
18a	Los Robles Archaeological District	Archaeological site	Pima County	SHPO	13,298 acres, NRHP-listed, Criterion D for potential to yield archaeological information; not protected by Section 4(f)



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
18b	Tucson Mountain Park Historic District	Historic district	Pima County	SHPO	28,708 acres, designed park landscape, and prehistoric sites; determined significant under Criterion A and C at the state level; property will be further assessed according to the NRHP and Section 4(f) criteria during Tier 2 studies
Pinal County					
19	Picacho Pass Skirmish Site--Overland Mail Company Stage Station	Historic battlefield and postal station (1858–1862)	Area around Picacho Peak, 1 mile northwest of I-10 Interchange 219	SHPO	724 acres, NRHP-listed in 2002, Criterion A for association with the Battle of Picacho Peak in 1862 and for one of the stations on the Butterfield Overland Mail stage route; open land with interpretive monuments and markers, portion of old mail route road
Maricopa County					
20	Southern Pacific Railroad – Phoenix Mainline (Wellton-Phoenix-Eloy Spur, AZ T:10:84(ASM)	Historic railroad (1926)	City of Buckeye, AZ	SHPO	205 miles, some segments are NRHP-eligible, Criterion A for its association with rail travel
21	Casa Grande Canal, AZ AA:3:209(ASM)	Historic site	Pinal County, AZ	SHPO	26 miles, NRHP-eligible, Criterion A for significance as water conduit
22	Gila Bend Canal, AZ Z:2:66(ASM)	Multi-component site	Maricopa County, AZ	SHPO	33 miles, NRHP-eligible, Criterion A for significance as water conduit



Property # on Figures	Property Name	Classification	Address/Location	Official(s) with Jurisdiction	Features/Attributes
23	Butterfield Overland Mail stage route (Gila Trail Archaeological Site, AZ T:15:32(ASM))	Historic road (1858–1861)	Segment north of Mobile; segment northeast of Gila Bend in Maricopa Mountain Pass/Butterfield Pass	SHPO	23 miles, NRHP-eligible, Criterion A for significance as remaining roadway components of the historic Butterfield postal delivery route
24	Wide Trail Site, AZ T:14:28(ASM)	Prehistoric trail with prehistoric Hohokam and Patayan pottery	Maricopa County, AZ	SHPO	NRHP-eligible, Criterion A and Criterion D for significance as prehistoric trail and artifacts
25	Three prehistoric trails, AZ T:14:94(ASM)	Prehistoric trails and rock cairns with Hohokam and Patayan artifacts	Maricopa County, AZ	SHPO	NRHP-eligible, Criterion A and Criterion D for significance as prehistoric trails and artifacts
26	Prehistoric artifacts and canal, AZ T:10:59(ASM)	Prehistoric canal with Hohokam artifacts	Maricopa County, AZ	SHPO	NRHP-eligible, Criterion A and Criterion D for significance as prehistoric canal and artifacts
27	Buckeye Canal, AZ T:10:82(ASM)	Historic site	Maricopa County, AZ	SHPO	4 miles, NRHP-eligible, Criterion A for significance as water conduit
28	Roosevelt Canal, AZ T:10:83(ASM)	Historic site	City of Buckeye, Maricopa County, AZ	SHPO	17 miles, NRHP-eligible, Criterion A for significance as water conduit
Yavapai County					
	None found				

SOURCES: ADOT 2017i. Cultural Resource Technical Report for the I-11 (Nogales to Wickenburg) Tier 1 EIS. Property acreages are based on GIS shapefiles and data available at the time of study.

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2
3



1 4.6 Assessment of Use of Section 4(f) Properties

2 After identifying the Section 4(f) properties in the Corridor Study Area, FHWA determined
3 whether and to what extent each Build Corridor Alternative and the No Build Alternative has the
4 potential to incorporate land from each property. To make this determination, protected
5 properties were identified that are partially or entirely within the 2,000-foot-wide corridor of the
6 Build Corridor Alternatives.

7 Then FHWA examined the potential to implement the project within each Build Corridor
8 Alternative without permanently incorporating land from each protected property. In this
9 process, FHWA considered three methods to avoid permanently using each property. All three
10 methods would apply engineering design and consideration of other natural and built
11 environment opportunities and constraints, and are described as follows:

- 12 • **Accommodate in the corridor.** Provide an alignment within the 2,000-foot-wide corridor
13 that avoids the protected property.
- 14 • **Shift the corridor.** Shift the 2,000-foot-wide corridor away from the protected property to
15 accommodate the project without using land from the protected property.
- 16 • **Grade-separate the corridor.** In the case of linear properties (such as trails, historic canals,
17 and historic railroads), a 2,000-foot-wide corridor would cross over or under the protected
18 property (such as on an elevated structure or depressed roadway section) without using
19 land from the protected property.

20 FHWA also determined that, for some properties in the Corridor Study Area, no use would
21 occur. For all other properties protected by Section 4(f), the potential use of a protected property
22 is evaluated by defining the type of use according to the definitions and criteria described in the
23 Section 4(f) regulations (23 CFR 774 et seq.), as summarized in **Section 4.4.2**.

24 4.6.1 No Build Alternative (2040)

25 The No Build Alternative (2040) represents the existing transportation system, along with
26 committed improvement projects that are programmed for funding. Within the Corridor Study
27 Area, the *2018-2022 Five-Year Transportation Facilities Construction Program* (ADOT 2017a)
28 identified several capacity improvements programmed and funded for construction on the
29 interstate and state highway system within the Corridor Study Area by 2022. The No Build
30 Alternative (2040) includes new capacity (additional lanes) on I-10 between Tucson and Casa
31 Grande and conversion of US 93 to a four-lane divided highway for a 3-mile segment through
32 Wickenburg, as shown on Draft Tier 1 EIS **Figure 2-6**. Other improvements are programmed in
33 the following locations:

- 34 • I-10: SR 85 to Verrado Way (Maricopa County)
- 35 • I-10: Ina Road to Ruthrauff Road (Pima County)
- 36 • I-10: SR 87 to Picacho (Pinal County)



- 1 • I-10: Earley Road to I-8 (Pinal County)
- 2 • US 93: Tegner Drive to SR 89
- 3 The No Build Alternative (2040) will avoid the use of Section 4(f) properties.

4 **4.6.2 Build Corridor Alternatives – No Use**

5 **4.6.2.1 Section 4(f) Properties Outside Build Corridor Alternatives (No Use)**

6 There are 89 properties that fall within the Corridor Study Area but outside the 2,000-foot-wide
7 corridor of the Build Corridor Alternatives. These properties would not be directly used under
8 any alternative. **Table 4-3** lists these properties.

9 **Table 4-3. Section 4(f) Properties Outside the Build Corridor Alternatives Where**
10 **No Use Would Occur**

Number on Figure 4-6 through Figure 4-11	Property Name
Parks, Recreation Lands, Wildlife and Waterfowl Refuges	
2	Nogales Recreation Area and existing/planned critical habitat areas (portion of Coronado National Forest)
3	Tubac Presidio State Historic Park
5	Canoa Preserve Park
5a	Abrego Trailhead
6	Quail Creek-Veterans Municipal Park
7	Parque Los Arroyos
9	Sahuarita Lake Park
10	North Santa Cruz Park
11	Summit Park
12	Star Valley Park
13	Lawrence Park
14	Mission Ridge Park
15	Ebonee Marie Moody Park
17	Mission Manor Park
18	Command Sgt. Maj. Martin “Gunny” Barreras Park (formerly Sunnyside Park)
19	Branding Iron Park
20	Oak Tree Park
21	Winston Reynolds – Manzanita District Park
24	Robles Pass at Tucson Mountain Park
26	Tucson Mountain Park



Number on Figure 4-6 through Figure 4-11	Property Name
27	John F. Kennedy Park
28	St. John's School Skate Park
31a	Centro del Sur Community Center
32	Vista del Pueblo Park
33	Ormsby Park
34	Ochoa Park
35	Santa Rita Park
36	Tumamoc Hill Preserve
37	Sentinel Peak Park
38	Verdugo Park
39	Santa Rosa Park
40	Parque de Orlando y Diego Mendoza
43	Rosendo S. Perez Park
44	La Pilita
45	El Tiradito Wishing Shrine
47	La Placita Park
48	Veinte de Agosto Park
50	Sunset Park
51	El Presidio Park
52	Jácome Plaza
53	Christopher Franklin Carroll Centennial Park
54	Presidio San Augustin del Tucson
55	Alene Dunlap Smith Garden
58	Greasewood Park
60	Feliz Paseos Park
61	Joaquin Murrieta Park
63	Manuel Valenzuela Alvarez Park
64	Saguaro National Park
65	Juhan Park
66	Silverbell Golf Course
67	Jacobs Park
68	Sweetwater Preserve
70	Christopher Columbus Park
70a	Rillito Regional Park
71	Flowing Wells Park
72	Dan Felix Memorial Park (formerly Peglar Wash Park)



Number on Figure 4-6 through Figure 4-11	Property Name
75	Richardson Park
77	Ann Day Community Park (formerly Northwest Community Park)
78	Northwest YMCA Community Center
80	Denny Dunn Park
81	Crossroads at Silverbell District Park
82	Continental Reserve Community Park
82b	Cortaro Mesquite Bosque
82c	Los Morteros Conservation Area
83	Sunset Pointe Park
84	El Rio Park
84a	El Rio Preserve
86	Santa Cruz River Park
87	Ora Mae Harn Park
88	Tortolita Preserve
89	San Lucas Community Park
90	Anza Trail Park
90a	Segment of Tortolita CAP Trail
94	Butterfield Pass Trail segment
95	Arlington Wildlife Area
96	Powers Butte Wildlife Area
97a	Maricopa Trail (Existing route)
99	Sonoran Foothills Community Park
100	White Tank Mountain Regional Park
100a	Skyline Regional Park
101	Vulture Mine RMZ
103	Wishing Well Park
104	Hassayampa River Walk
105	Coffinger Park
106	Constellation Park
Historic Sites	
38	Tumamoc Hill Preserve
15	Ronstadt-Sims Adobe Warehouse
20	Southern Pacific Railroad – Phoenix Main Line (Wellton-Phoenix-Eloy Spur (AZ T:10:84(ASM)))



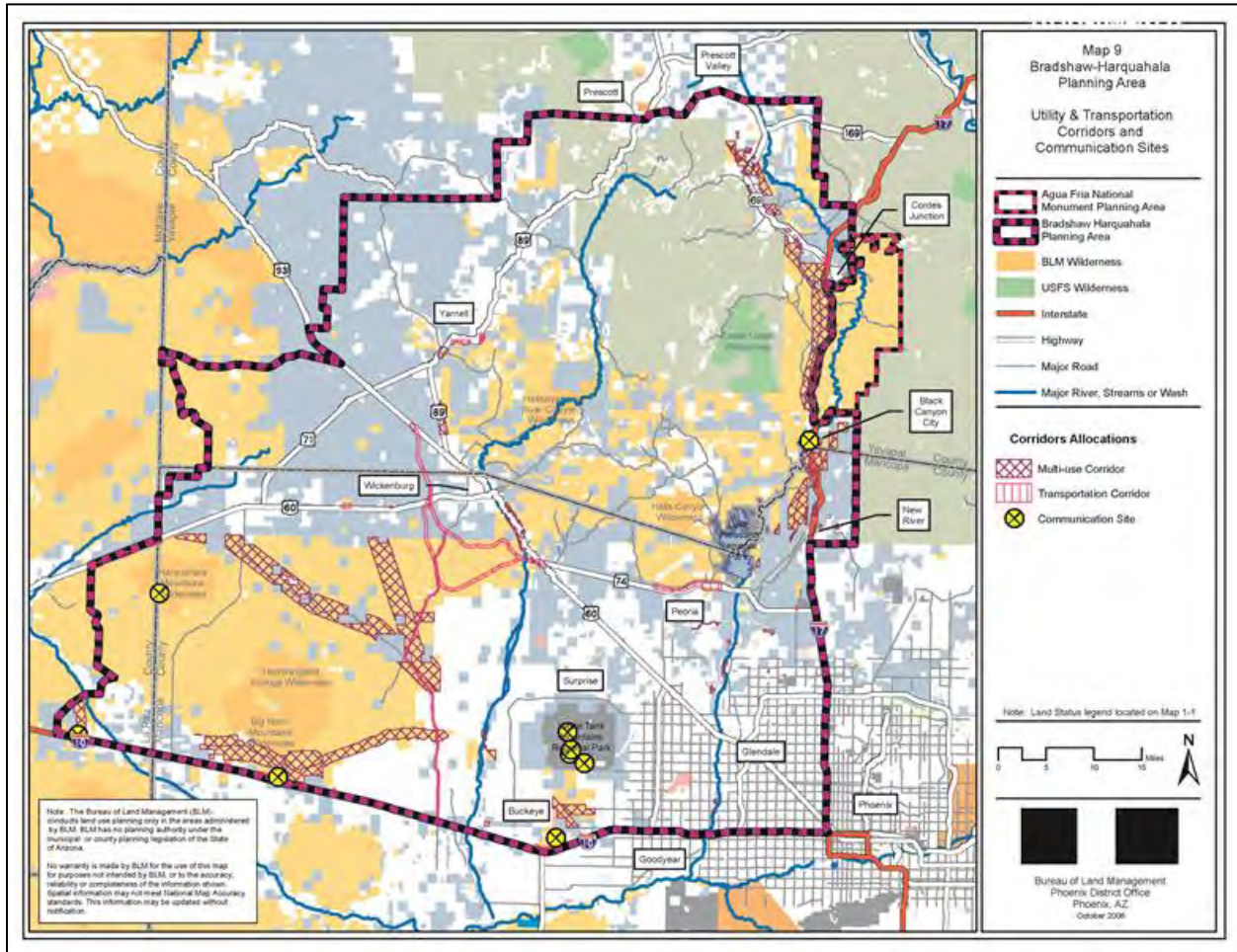
1 Among these properties is the BLM-owned Vulture Mine RMZ. BLM is the official with
2 jurisdiction over the property, which consists of approximately 70,000 acres south of
3 Wickenburg, Arizona. Activities on the land are guided by two primary planning documents: the
4 BLM *Bradshaw-Harquahala Resource Management Plan/Record of Decision* (BLM 2010) and
5 the *Vulture Mountains Cooperative Recreation Management Area Master Plan* (Maricopa
6 County 2012). The RMP is relevant to the I-11 Corridor Project because it identifies how and
7 where activities can occur on the Vulture Mine RMZ property; the Master Plan is relevant to the
8 I-11 Corridor Project because it provides the framework for implementing activities. The relevant
9 aspects of each plan are briefly described as follows:

- 10 • **Bradshaw-Harquahala RMP.** The RMP provides guidance to the BLM Hassayampa Field
11 Office regarding current and future management decisions for Vulture Mine RMZ. The RMP
12 designates a number of multi-use corridors, including the north-south multi-use corridor that
13 crosses the western portion of the Vulture Mine RMZ property (**Figure 4-12**). Multi-use
14 corridors are defined in the RMP as being for major utilities and regionally significant
15 transportation uses. The RMP specifies that BLM will coordinate with ADOT in advancing
16 such transportation uses in multi-use corridors.
- 17 • **Vulture Mountains Cooperative Recreation Management Area Master Plan.** The Master
18 Plan established public policies regarding recreational use, land management, and
19 supporting facility development on the property (**Figure 4-13**). The Master Plan is intended
20 to guide land managers as decisions are made for recreation uses of the public lands within
21 the property, as well as for the provision of public facilities on public lands within the
22 property.

23 FHWA has determined on the basis of the RMP that Section 4(f) does not apply to the multi-use
24 corridor that crosses the Vulture Mine RMZ because the purpose of the multi-use corridor is to
25 co-locate utilities and transportation infrastructure (**Figure 4-13**). BLM concurred with FHWA's
26 determination on April 30, 2018 (**Appendix F3** [Correspondence Related to Preliminary Section
27 4(f) Evaluation]).

28 FHWA, ADOT, and BLM initiated coordination regarding Vulture Mine RMZ during scoping for
29 the I-11 Corridor Project. During development and evaluation of the alternative corridors, FHWA
30 and ADOT continued to coordinate with BLM in regard to Vulture Mine RMZ. In this
31 coordination, corridor alignments inside and outside the multi-use corridor were discussed. BLM
32 discouraged alignments across the property and outside the multi-use corridor, noting the
33 mission of the property to protect natural resources and provide recreation opportunities (refer
34 to the BLM correspondence in **Appendix F3** [Correspondence Related to Preliminary Section
35 4(f) Evaluation]).

36



1

2 SOURCE: BLM, Bradshaw-Harquahala Resource Management Plan/Record of Decision. April 22, 2010.

3

Figure 4-12. Bradshaw-Harquahala Planning Area Map

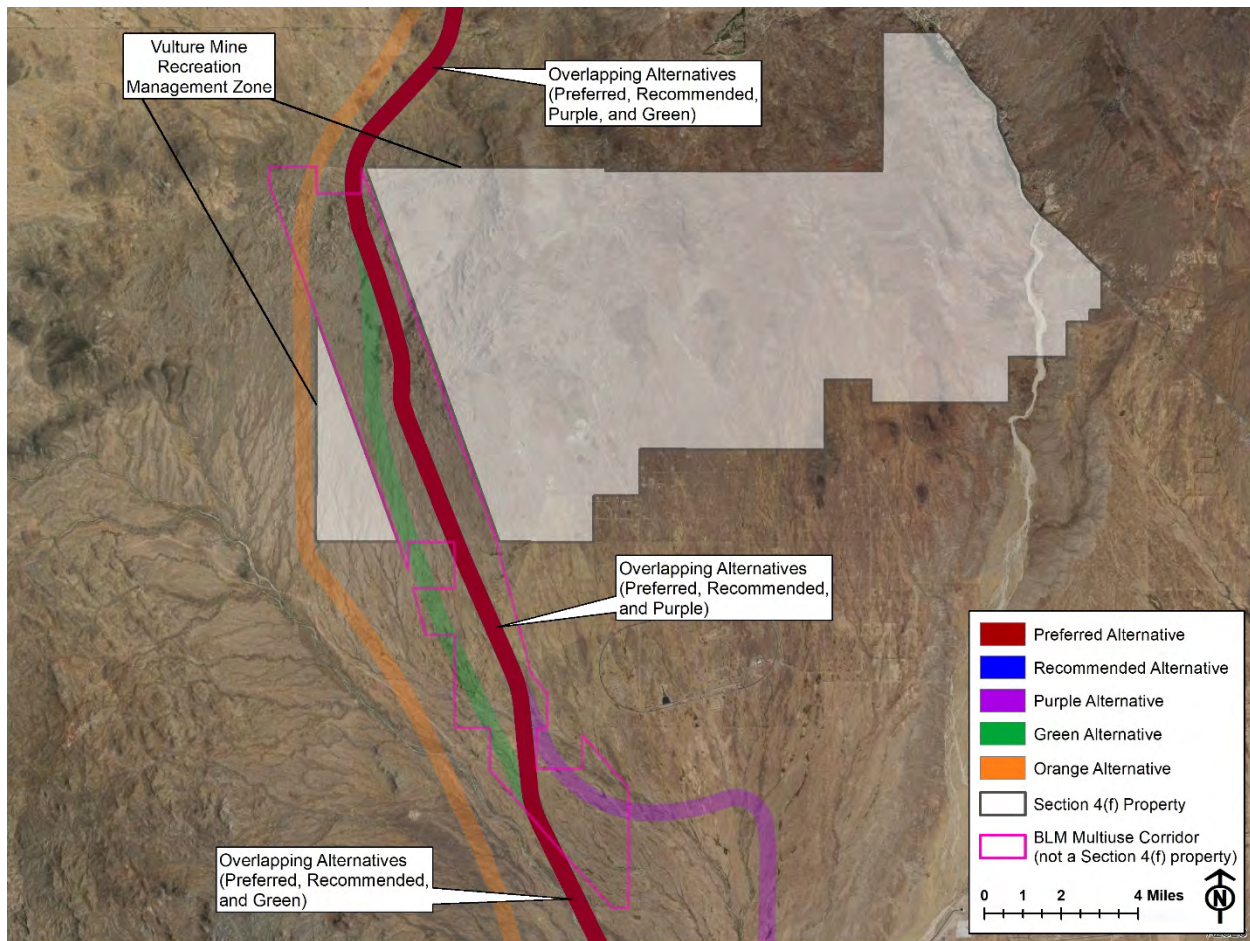


Figure 4-13. Build Corridor Alternatives near Vulture Mine RMZ

Through coordination with BLM, FHWA and ADOT developed Options X and U, corridor options that would be located within the multi-use corridor across the Vulture Mine RMZ property. Options X and U, when applied to the Preferred, Recommended, Purple, and Green Alternatives, would provide the opportunity for these alternatives to avoid a use of the Vulture Mine RMZ. In addition, and consistent with 23 CFR 774.7(e)(1), opportunities to minimize harm to the property at subsequent stages in the project development process (for example, Tier 2), are not precluded. At this preliminary level of planning, FHWA and ADOT have identified no engineering or environmental constraints that would obstruct or preclude the ability to provide a highway alignment that achieves general engineering design standards in the multi-use corridor. As a result of being able to avoid Vulture Mine RMZ, no use of the property as defined by Section 4(f) would occur as a result of the I-11 Corridor Project.

The Orange Alternative (Option S) would be aligned west of and adjacent to the Vulture Mine RMZ property such that no use of the Vulture Mine RMZ property would occur. BLM stated its preference for Option S in its April 30, 2018, letter to FHWA (**Appendix F3** [Correspondence Related to Preliminary Section 4(f) Evaluation]). Consistent with 23 CFR 774.7(e)(1), opportunities to minimize harm to the property at subsequent stages in the project development process (for example, Tier 2) are not precluded. At this preliminary level of planning, FHWA and ADOT have identified no engineering or environmental constraints that would obstruct or



1 preclude the ability to provide a highway alignment that achieves general engineering design
2 standards west of and adjacent to the Vulture Mine RMZ property.

3 4.6.2.2 Section 4(f) Properties in Build Corridors

4 There are 55 properties partially or entirely within one or more Build Corridor Alternatives (**Table**
5 **4-4**). The following terms are used in **Table 4-4** and **Table 4-5**:

- 6 • **Outside corridor.** The property is entirely outside the 2,000-foot-wide corridors.
- 7 • **In corridor.** The property is entirely within the 2,000-foot-wide corridor.
- 8 • **Mostly in corridor.** The property is mostly within the 2,000-foot-wide corridor; a
9 comparatively small part of the property is outside the 2,000-foot-wide corridor
- 10 • **Partially in corridor.** The property is partly within the 2,000-foot-wide corridor; most of the
11 property is outside the 2,000-foot-wide corridor.
- 12 • **Crosses corridor.** The property is linear in shape and is partly in the 2,000-foot-wide
13 corridor as it crosses from one side of the corridor to the other.

14 The acreage of each property in a corridor is quantified along with the percentage of the total
15 property in the corridor. **Figure 4-14** through **Figure 4-19** show the locations of the properties in
16 relation to the Build Corridor Alternatives.

17 The potential for use of Section 4(f) properties prompted FHWA and ADOT to assess whether,
18 by using typical construction techniques and the findings of the Final Tier 1 EIS, permanent
19 incorporation of land from the protected property can be avoided by alignment shifts and design
20 changes described in this section. An alignment shift is the rerouting of a portion of I-11 to a
21 different alignment within the 2,000-foot-wide corridor to avoid the potential use of a specific
22 property. A design change is a modification of the proposed design in a manner that would
23 avoid impacts.

24 This assessment was performed in accordance with the regulations of Section 4(f) regarding
25 first-tier analysis (23 CFR 774.7(e)(1)). Specifically, FHWA and ADOT “applied all possible
26 planning to minimize harm to the extent that the level of detail available at the first-tier EIS stage
27 allows” in order for a preliminary Section 4(f) approval to be made.

28 In this assessment, FHWA and ADOT evaluated the three methods described at the beginning
29 of **Section 4.6** to avoid Section 4(f) properties: accommodate in the corridor, shift the corridor,
30 and grade-separate the corridor.

31 The results of this evaluation are summarized in **Table 4-5** and are described in the subsections
32 that follow the table.

33 The Section 4(f) properties listed in **Table 4-5** that are to be avoided may be impacted if
34 additional Section 4(f) properties are discovered during Tier 2 studies.

35

Table 4-4. Section 4(f) Properties in the Build Corridor Alternatives (Potential Use)

Map #	Property Name	Property Area/Percent Inside Corridor (acres or miles [%])						Existing Property Acreage (length for trails/ greenways)	Description of Potential impact (Applicable Alternative)
		Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option	Purple Alternative	Green Alternative	Orange Alternative		
Parks, Recreation Areas, and Wildlife and Waterfowl Areas									
Multiple Counties									
1	Juan Bautista de Anza National Historic Trail	0.6 mile (<1%)	0.6 mile (<1%)	4.3 miles (4%)	0.6 mile (<1%)	0.6 mile (<1%)	4.2 miles (3%)	121.4 miles	Crosses corridor (Preferred west option and Recommended) or partially in corridor (Preferred east option, Purple, Green, and Orange)
Pima County									
8	Anamax Park	22.0 acres (60%)	22.0 acres (60%)	28.7 acres (79%)	0 acres	32.2 acres (88%)	28.7 acres (79%)	36.5 acres	Mostly in corridor (Preferred west option, Preferred east option, Recommended, Green, and Orange)
16	Pima Community College, Desert Vista Campus	0 acres	0 acres	4.5 acres (100%)	0 acres	0 acres	4.5 acres (100%)	4.5 acres	In corridor (Preferred east option and Orange)
22	Tucson Mitigation Corridor	565.9 acres (23%)	565.9 acres (23%)	0 acres	453.1 acres (18%)	452.3 acres (18%)	0 acres	2,514 acres	Partially in corridor (Preferred west option, Recommended, Purple, and Green)
23	Santa Cruz River Park	0 acres	0 acres	131.3 acres (28%)	0 acres	0 acres	131.3 acres (28%)	468.6 acres	Partially in corridor (Preferred east option and Orange)
25	La Mar Park	0 acres	0 acres	3.2 acres (100%)	0 acres	0 acres	3.2 acres (100%)	3.2 acres	Mostly in corridor (Preferred east option and Orange)
29	Julian Wash Greenway	0 miles	0 miles	0.6 mile (75%)	0 miles	0 miles	0.6 mile (75%)	0.8 mile	Partially in corridor (Preferred east option and Orange)
30	Julian Wash Archaeological Park	0 acres	0 acres	15.8 acres (98%)	0 acres	0 acres	15.8 acres (98%)	16.2 acres	Mostly in corridor (Preferred east option and Orange)
31	El Paso and Southwestern Greenway (Planned Trail)	0 miles	0 miles	2.1 miles (62%)	0 miles	0 miles	2.1 miles (62%)	3.4 miles	Mostly in corridor (Preferred east option and Orange)
41	El Paso and Southwestern Greenway (Existing Trail)	0 miles	0 miles	0.1 mile (100%)	0 miles	0 miles	0.1 mile (100%)	0.1 mile	Crosses corridor (Preferred east option and Orange)
42	El Parque de San Cosme	0 acres	0 acres	0.8 acre (100%)	0 acres	0 acres	0.8 acre (100%)	0.8 acre	In corridor (Preferred east option and Orange)
46	Gethsemane Garden of Prayer	0 acres	0 acres	1.3 acres (100%)	0 acres	0 acres	1.3 acres (100%)	1.3 acres	In corridor (Preferred east option and Orange)
49	Bonita Park	0 acres	0 acres	1.4 acres (100%)	0 acres	0 acres	1.4 acres (100%)	1.4 acres	In corridor (Preferred east option and Orange)
56, 57	David G. Herrera and Ramon Quiroz Park (formerly Oury Park)	0 acres	0 acres	6.6 acres (100%)	0 acres	0 acres	6.6 acres (100%)	6.6 acres	Partially in corridor (Preferred east option and Orange)
59	Estevan Park	0 acres	0 acres	2.3 acres (27%)	0 acres	0 acres	2.3 acres (27%)	8.2 acres	Partially in corridor (Preferred east option and Orange)
62	Francesco Elias Esquer Park	0 acres	0 acres	0.9 acre (14%)	0 acres	0 acres	0.9 acre (14%)	6.3 acres	Partially in corridor (Preferred east option and Orange)
69	Sweetwater Wetlands Park	0 acres	0 acres	0.9 acre (2%)	0 acres	0 acres	0.9 acre (2%)	58.3 acres	Partially in corridor (Preferred east option and Orange)
73	Pima Prickly Park	0 acres	0 acres	7.8 acres (20%)	0 acres	0 acres	7.8 acres (20%)	40.1 acres	Partially in corridor (Preferred east option and Orange)
74	Rillito River Park	0 acres	0 acres	4.6 acres (73%)	0 acres	0 acres	4.6 acres (73%)	6.3 acres	Mostly in corridor (Preferred east option and Orange)
74a	Camino de la Tierra Trailhead	0 acres	0 acres	7.7 acres (84%)	0 acres	0 acres	7.7 acres (84%)	9.1 acres	Partially in corridor (Preferred east option and Orange)
76	Ted Walker Park	0 acres	0 acres	3.2 acres (100%)	0 acres	0 acres	3.2 acres (100%)	3.2 acres	Partially in corridor (Preferred east option and Orange)
76a	Mike Jacob Sports Park	0 acres	0 acres	36.9 acres (52%)	0 acres	0 acres	36.9 acres (52%)	70.7 acres	Partially in corridor (Preferred east option and Orange)
79	Cañada del Oro (Christina-Taylor Green Memorial River Park)	0 acres	0 acres	1.5 acres (6%)	0 acres	0 acres	1.5 acres (6%)	26.1 acres	Partially in corridor (Preferred east option and Orange)
85	Rillito Vista Neighborhood Park	0 acres	0 acres	1.7 acres (100%)	0 acres	0 acres	1.7 acres (100%)	1.7 acres	In corridor (Preferred east option and Orange)
89	San Lucas Community Park	0 acres	0 acres	4.9 acres (37%)	0 acres	0 acres	4.9 acres (37%)	13.2 acres	Partially in corridor (Preferred east option and Orange)
Pinal County									
91	Picacho Peak State Park	0 acres	0 acres	0 acres	227.9 acres (6%)	0 acres	227.9 acres (6%)	3,726.3 acres	Partially in corridor (Purple and Orange)

Map #	Property Name	Property Area/Percent Inside Corridor (acres or miles [%])						Existing Property Acreage (length for trails/ greenways)	Description of Potential impact (Applicable Alternative)
		Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option	Purple Alternative	Green Alternative	Orange Alternative		
92	West Pinal (Kortsen) Park	0 acres	0 acres	0 acres	0 acres	0 acres	47.5 acres (38%)	123.4 acres	Partially in corridor (Orange)
93	Palo Verde Regional Park (Pinal County Parks)	62.6 acres (<1%)	62.6 acres (<1%)	62.6 acres (<1%)	305.1 acres (1%)	305.1 acres (1%)	427.3 acres (2%)	22,810.6 acres for recreation	Partially in corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
Maricopa County									
97	Buckeye Hills Regional Park	0 acres	184.4 acres (4%)	184.4 acres (4%)	0 acres	184.4 acres (4%)	345.4 acres (7%)	4,648.4 acres	Partially in corridor (Preferred west option, Preferred east option, Green, and Orange)
97b	Maricopa Trail (Planned route)	0.6 linear foot (2%)	1.2 linear feet (5%)	1.2 linear feet (5%)	1.2 linear feet (5%)	1.2 linear feet (5%)	0.6 linear foot (2%)	25.5 linear feet	Crosses corridor (Preferred west option, Preferred east option, Purple, Green, and Orange)
98	Robbins Butte Wildlife Area	328.7 acres (6%)	328.7 acres (6%)	328.7 acres (6%)	0 acres	328.7 acres (6%)	328.7 acres (6%)	5,676.4 acres	Recommended, Preferred west option, Preferred east option, Green, and Orange Alternatives can likely be accommodated within existing SR 85 right-of-way
98a	Public Land Order 1015 Lands and adjacent AGFD Parcels	42 acres (0.6%)	32 acres (0.5%)	32 acres (0.5%)	42 acres (0.6%)	32 acres (0.5%)	32 acres (0.5%)	6,906 acres	Preferred west option, Preferred east option, Green, or Orange Alternatives can likely be accommodated within existing SR 85 right-of-way; Recommended or Purple are a new crossing
Historic Sites									
Multiple Counties									
13	Southern Pacific Railroad – Phoenix Mainline (Wellton-Phoenix-Eloy Spur (AZ T:10:84(ASM)))	0.6 mile (1%)	0.4 mile (<1%)	0.4 mile (<1%)	0.6 mile (1%)	0.6 mile (1%)	0.4 mile (<1%)	110.8 miles	Partially in corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
18	Arizona Southern Railroad Company – railroad grade AZ AA:10:19(ASM)	0.5 mile (3%)	0.4 mile (2%)	0.1 mile (1%)	0.1 mile (1%)	0.5 mile (3%)	0.1 mile (1%)	17.3 miles	Partially in corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
Santa Cruz County									
1	New Mexico and Arizona Railroad: Nogales Branch, AZ EE:4:43(ASM)	1.6 acres (<1%)	1.6 acres (<1%)	1.6 acres (<1%)	1.6 acres (<1%)	1.6 acres (<1%)	1.6 acres (<1%)	340.1 acres	Partially in corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
2	Otero Cemetery, near Palo Parado interchange, AZ DD:8:165(ASM)	0.2 acre (100%)	0.2 acre (100%)	0.2 acre (100%)	0.2 acre (100%)	0.2 acres (100%)	0.2 acre (100%)	0.2 acre	In corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
3, 4	Tumacácori National Monument and Museum (Tumacácori National Historic Park)	6.2 acres (23%)	6.2 acres (23%)	6.2 acres (23%)	6.2 acres (23%)	6.2 acres (23%)	6.2 acres (23%)	26.6 acres	Partially in corridors (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
Pima County									
5	Canoa Ranch Rural Historic District (Hacienda de la Canoa, Raul M. Grijalva Canoa Ranch Conservation Park and Canoa Ranch Rural Historic District)	443.9 acres (9%)	443.9 acres (9%)	443.9 acres (9%)	0 acres	443.9 acres (9%)	443.9 acres (9%)	4,951.8 acres	Partially in corridor (Preferred west option, Preferred east option, Recommended, Green, and Orange)
6	San Agustin del Tucson Mission site, AZ BB:13:6(ASM)	0 acres	0 acres	6.2 acres (3%)	0 acres	0 acres	6.2 acres (3%)	194.3 acres	Partially in corridor (Preferred east option and Orange)
7	Barrio El Hoyo Historic District	0 acres	0 acres	7.5 acres (50%)	0 acres	0 acres	7.5 acres (50%)	15.1 acres	Partially in corridor (Preferred east option and Orange)
8	Barrio El Membrillo Historic District	0 acres	0 acres	5.8 acres (100%)	0 acres	0 acres	5.8 acres (100%)	5.8 acres	In corridor (Preferred east option and Orange)
9	El Paso and Southwestern Railroad District	0 acres	0 acres	42.4 acres (87%)	0 acres	0 acres	42.4 acres (87%)	48.9 acres	Mostly in corridor (Preferred east option and Orange)
10	Menlo Park Historic District	0 acres	0 acres	3.3 acres (1%)	0 acres	0 acres	3.3 acres (1%)	231.9 acres	Partially in corridor (Preferred east option and Orange)
11	Levi H. Manning House	0 acres	0 acres	3.0 acres (100%)	0 acres	0 acres	3.0 acres (100%)	3.0 acres	In corridor (Preferred east option and Orange)

Map #	Property Name	Property Area/Percent Inside Corridor (acres or miles [%])						Existing Property Acreage (length for trails/ greenways)	Description of Potential impact (Applicable Alternative)
		Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option	Purple Alternative	Green Alternative	Orange Alternative		
12	El Presidio Historic District	0 acres	0 acres	2.6 acres (6%)	0 acres	0 acres	2.6 acres (6%)	42.4 acres	Partially in corridor (Preferred east option and Orange)
14	Barrio Anita Historic District	0 acres	0 acres	36.7 acres (100%)	0 acres	0 acres	36.7 acres (100%)	36.8 acres	Partially in corridor (Preferred east option and Orange)
16	USDA Tucson Plant Materials Center	0 acres	0 acres	5.8 acres (69%)	0 acres	0 acres	5.8 acres (69%)	8.4 acres	Partially in corridor (Preferred east option and Orange)
17	Cortaro Farms Canal/Cortaro-Marana Irrigation District Canal	0.2 mile	0 acres	10.0 miles (80%)	0.2 mile (2%)	0 miles	10.0 miles (80%)	12.5 miles	Crosses corridor (Purple); partially within corridor (Preferred east option and Orange)
Pinal County									
19	Picacho Pass Skirmish Site--Overland Mail Company Stage Station	0 acres	0 acres	34.8 acres (5%)	34.8 acres (5%)	0 acres	34.8 acres (5%)	724.0 acres	Partially in corridor (Preferred east option, Purple and Orange)
Maricopa County									
21	Casa Grande Canal, AZ AA:3:209(ASM)	1.7 mile (7%)	0 miles	0 miles	0.7 mile (3%)	1.7 mile (7%)	0.7 mile (3%)	25.8 miles	Partially in corridor (Recommended, Purple, Green, and Orange)
22	Gila Bend Canal, AZ Z:2:66(ASM)	0 miles	0 miles	0 miles	0 miles	0 miles	1 mile (3%)	33.3 miles	Crosses corridor (Orange)
23	Butterfield Overland Mail stage route (Gila Trail Archaeological Site (AZ T:15:32(ASM)))	0.4 mile (2%) / 0 acres	0.4 mile (2%) / 0 acres	0.4 mile (2%) / 0 acres	0.4 mile (2%) / 0 acres	0.4 mile (2%) / 0 acres	0.4 mile (2%) / 3.7 acres (89%)	23.4 miles / 4.1 acres	Crosses corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
24	Wide Trail Site, AZ T:14:28(ASM)	0 acres	0 acres	0 acres	0 acres	0 acres	6.8 acres (98%)	6.9 acres	Mostly in corridor (Orange)
25	Three prehistoric trails, AZ T:14:94(ASM)	0 acres	0 acres	0 acres	0 acres	0 acres	3.1 acres (98%)	3.1 acres	Mostly in corridor (Orange)
26	Prehistoric artifacts and canal, AZ T:10:59(ASM)	0 acres	1.6 acres (29%)	1.6 acres (29%)	0 acres	1.6 acres (29%)	1.6 acres (29%)	5.6 acres	Partially in corridor (Preferred west option, Preferred east option, Green, and Orange)
27	Buckeye Canal, AZ T:10:82(ASM)	0.7 mile (16%)	0.4 mile (9%)	0.4 mile (9%)	0.7 mile (16%)	0.7 mile (16%)	0.4 mile (9%)	4.4 miles	Crosses corridor (Orange); partially in corridor (Preferred west option, Preferred east option, Recommended, Purple, and Green)
28	Roosevelt Canal, AZ T:10:83(ASM)	0 miles	0.8 mile (5%)	0.8 mile (5%)	0 miles	0 miles	0.8 mile (5%)	16.8 miles	Crosses corridor (Preferred west option, Preferred east option, and Orange)

1 SOURCE: AECOM. 2020. GIS Analysis. I-11 Section 4(f) Property Export into Excel and Impact Analysis. December 4, 2020.
 2 Note: Property acreages are based on GIS shapefiles and data available at the time of study.
 3



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Table 4-5. Summary of Use by Build Corridor Alternatives

Map #	Property Name	Summary of Use Findings						Description of Potential impact (Applicable Alternative Corridor)
		Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option	Purple Alternative	Green Alternative	Orange Alternative	
Parks, Recreation Areas, and Wildlife and Waterfowl Areas								
Multiple Counties								
1	Juan Bautista de Anza National Historic Trail	No use – grade-separate	No use – grade-separate	No use – accommodate	No use – grade-separate	No use – accommodate	No use – accommodate	Crosses corridor (Preferred west option and Recommended) or partially in corridor (Preferred east option, Purple, Green, and Orange)
Pima County								
8	Anamax Park	No use – shift corridor	No use – shift corridor	No use – shift corridor	No use – outside corridor	No use – shift corridor	No use – shift corridor	Mostly in corridor (Preferred west option, Preferred east option, Recommended, Green, and Orange can accommodate Anamax Park as a result of the shift)
16	Pima Community College, Desert Vista Campus	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	In corridor (Preferred east option and Orange)
22	Tucson Mitigation Corridor	Use	Use	No use – outside corridor	Use	Use	No use – outside corridor	Partially in corridor (Preferred west option, Recommended, Purple, and Green)
23	Santa Cruz River Park	No use – outside corridor	No use – outside corridor	Potential use	No use – outside corridor	No use – outside corridor	Potential use	Partially in corridor (Preferred east option and Orange)
25	La Mar Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Mostly in corridor (Preferred east option and Orange)
29	Julian Wash Greenway	No use – outside corridor	No use – outside corridor	No use – grade-separate	No use – outside corridor	No use – outside corridor	No use – grade-separate	Partially in corridor (Preferred east option and Orange)
30	Julian Wash Archaeological Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Mostly in corridor (Preferred east option and Orange)
31	El Paso and Southwestern Greenway (Planned Trail)	No use – outside corridor	No use – outside corridor	Potential use	No use – outside corridor	No use – outside corridor	Potential use	Mostly in corridor alongside I-10 (Preferred east option and Orange)
41	El Paso and Southwestern Greenway (Existing Trail)	No use – outside corridor	No use – outside corridor	No use – grade-separate	No use – outside corridor	No use – outside corridor	No use – grade-separate	Crosses corridor (Preferred east option and Orange)
42	El Parque de San Cosme	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	In corridor (Preferred east option and Orange)
46	Gethsemane Garden of Prayer	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	In corridor (Preferred east option and Orange)
49	Bonita Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	In corridor (Preferred east option and Orange)
56, 57	David G. Herrera and Ramon Quiroz Park (formerly Oury Park)	No use – outside corridor	No use – outside corridor	Potential use	No use – outside corridor	No use – outside corridor	Potential use	In corridor (Preferred east option and Orange)
59	Estevan Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
62	Francesco Elias Esquer Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
69	Sweetwater Wetlands Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
73	Pima Prickly Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)

Map #	Property Name	Summary of Use Findings						Description of Potential impact (Applicable Alternative Corridor)
		Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option	Purple Alternative	Green Alternative	Orange Alternative	
74	Rillito River Park	No use – outside corridor	No use – outside corridor	No use – accommodate; grade-separate	No use – outside corridor	No use – outside corridor	No use – accommodate; grade-separate	Mostly in corridor (Preferred east option and Orange)
74a	Camino de la Tierra Trailhead	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Mostly in corridor (Preferred east option and Orange)
76	Ted Walker Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
76a	Mike Jacob Sports Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Mostly in corridor (Preferred east option and Orange)
79	Cañada del Oro (Christina-Taylor Green Memorial River Park)	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
85	Rillito Vista Neighborhood Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	In corridor (Preferred east option and Orange)
89	San Lucas Community Park	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
Pinal County								
91	Picacho Peak State Park	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – accommodate	Partially in corridors (Purple and Orange)
92	West Pinal (Kortsen) Park	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Orange)
93	Palo Verde Regional Park (Pinal County Parks)	No use – shift corridor; grade separate	No use – shift corridor; grade separate	No use – shift corridor; grade separate	No use – shift corridor; grade separate	No use – shift corridor; grade separate	No use – accommodate	Crosses corridor (Preferred west option, Preferred east option, Recommended, Purple, and Green), partially in corridor (Orange)
Maricopa County								
97	Buckeye Hills Regional Park	No use – outside corridor	No use – accommodate	No use – accommodate	No use – outside corridor	No use – accommodate	No use – accommodate	Partially in corridor (Preferred west option, Preferred east option, Green, and Orange)
97b	Maricopa Trail (Planned route)	No use – grade-separate	No use – grade-separate	No use – grade-separate	No use – grade-separate	No use – grade-separate	No use – grade-separate	Crosses corridor (Preferred west option, Preferred east option, Purple, Green, and Orange)
98	Robbins Butte Wildlife Area	No use, or possible <i>de minimis</i> use	No use, or possible <i>de minimis</i> use	No use, or possible <i>de minimis</i> use	No use – outside corridor	No use, or possible <i>de minimis</i> use	No use, or possible <i>de minimis</i> use	Partially in corridor (Recommended, Preferred west option, Preferred east option, Green, and Orange Alternatives can likely be accommodated within existing SR 85 right-of-way); outside corridor (Purple)
98a	Public Land Order 1015 lands and adjacent AGFD Parcels	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	Partially in corridor (Preferred, Recommended, Green, and Orange Alternatives can likely be accommodated within existing SR 85 right-of-way); partially in corridor (Purple is a new crossing)
Historic Sites								
Multiple Counties								
13	Southern Pacific Railroad – Phoenix Mainline (Welton-Phoenix-Eloy Spur (AZ T:10:84(ASM)))	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	Partially in corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)

Map #	Property Name	Summary of Use Findings						Description of Potential impact (Applicable Alternative Corridor)
		Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option	Purple Alternative	Green Alternative	Orange Alternative	
18	Arizona Southern Railroad Company – railroad grade AZ AA:10:19(ASM)	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	Partially in corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
Santa Cruz County								
1	New Mexico and Arizona Railroad: Nogales Branch, AZ EE:4:43(ASM)	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	Partially in corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
2	Otero Cemetery, near Palo Parado interchange, AZ DD:8:165(ASM)	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	In corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
3, 4	Tumacácori National Monument and Museum (Tumacácori National Historic Park)	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	No use – accommodate	Partially in corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
5	Canoa Ranch Rural Historic District (Hacienda de la Canoa, Raul M. Grijalva Canoa Ranch Conservation Park and Canoa Ranch Rural Historic District)	No use – accommodate	No use – accommodate	No use – accommodate	No use – outside corridor	No use – accommodate	No use – accommodate	Partially in corridor (Preferred west option, Preferred east option, Recommended, Green, and Orange)
6	San Agustin del Tucson Mission site, AZ BB:13:6(ASM)	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
7	Barrio El Hoyo Historic District	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
8	Barrio El Membrillo Historic District	No use – outside corridor	No use – outside corridor	Potential use	No use – outside corridor	No use – outside corridor	Potential use	In corridor (Preferred east option and Orange)
9	El Paso and Southwestern Railroad District	No use – outside corridor	No use – outside corridor	Potential use	No use – outside corridor	No use – outside corridor	Potential use	Mostly in corridor (Preferred east option and Orange)
10	Menlo Park Historic District	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
11	Levi H. Manning House	No use – outside corridor	No use – outside corridor	Potential use	No use – outside corridor	No use – outside corridor	Potential use	In corridor (Preferred east option and Orange)
12	El Presidio Historic District	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
14	Barrio Anita Historic District	No use – outside corridor	No use – outside corridor	Potential use	No use – outside corridor	No use – outside corridor	Potential use	Partially in corridor (Preferred east option and Orange)
16	USDA Tucson Plant Materials Center	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – outside corridor	No use – outside corridor	No use – accommodate	Partially in corridor (Preferred east option and Orange)
17	Cortaro Farms Canal/Cortaro-Marana Irrigation District Canal	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – grade-separate	No use – outside corridor	No use – accommodate	Crosses corridor (Purple); partially within corridor (Preferred east option and Orange)
Pinal County								
19	Picacho Pass Skirmish Site-- Overland Mail Company Stage Station	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – accommodate	No use – outside corridor	No use – accommodate	Partially in corridors (Preferred east option, Purple, and Orange)

Map #	Property Name	Summary of Use Findings						Description of Potential impact (Applicable Alternative Corridor)
		Recommended Alternative	Preferred Alternative with West Option	Preferred Alternative with East Option	Purple Alternative	Green Alternative	Orange Alternative	
Maricopa County								
21	Casa Grande Canal, AZ AA:3:209(ASM)	No use – grade-separate	No use – outside corridor	No use – outside corridor	No use – accommodate	No use – accommodate	No use – accommodate	Partially in corridor (Recommended, Purple, Green, and Orange)
22	Gila Bend Canal, AZ Z:2:66(ASM)	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – grade-separate	No use – outside corridor	No use – grade-separate	Crosses corridor (Orange)
23	Butterfield Overland Mail stage route (Gila Trail Archaeological Site (AZ T:15:32(ASM)))	No use – grade-separate	No use – grade-separate	No use – grade-separate	No use – grade-separate	No use – grade-separate	No use – grade-separate	Crosses corridor (Preferred west option, Preferred east option, Recommended, Purple, Green, and Orange)
24	Wide Trail Site, AZ T:14:28(ASM)	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – grade-separate	Mostly in corridor (Orange)
25	Three prehistoric trails, AZ T:14:94(ASM)	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – outside corridor	No use – accommodate	Mostly in corridor (Orange)
26	Prehistoric artifacts and canal, AZ T:10:59(ASM)	No use – outside corridor	No use – accommodate	No use – accommodate	No use – outside corridor	No use – accommodate	No use – accommodate	Partially in corridor (Preferred west option, Preferred east option, Green, and Orange)
27	Buckeye Canal, AZ T:10:82(ASM)	No use – grade-separate	No use – grade-separate	No use – grade-separate	No use – grade-separate	No use – grade-separate	No use – grade-separate	Crosses corridor (Recommended, Preferred, Purple, Green, Orange) can likely grade-separate
28	Roosevelt Canal, AZ T:10:83(ASM)	No use – outside corridor	No use – grade-separate	No use – grade-separate	No use – outside corridor	No use – outside corridor	No use – grade-separate	Crosses corridor (Preferred west option, Preferred east option, and Orange)

1 SOURCE: AECOM. 2020. GIS Analysis. I-11 Section 4(f) Property Export into Excel and Impact Analysis. December 4, 2020.

2 NOTES:

3 Accommodate in the corridor – Provide space for a minimum of a 400-foot-wide linear roadway right-of-way within the 2,000-foot-wide corridor of a Build Corridor Alternative while avoiding the protected property.

4 Shift the corridor – Shift the 2,000-foot-wide corridor away from the protected property in order to accommodate the project and avoid the protected property.

5 Grade-separate the corridor – The corridor would cross over or under the protected property (such as on an elevated structure or depressed roadway section) to avoid the protected property.

6 Grey shading indicates a potential use of a property by a Build Corridor Alternative.

7

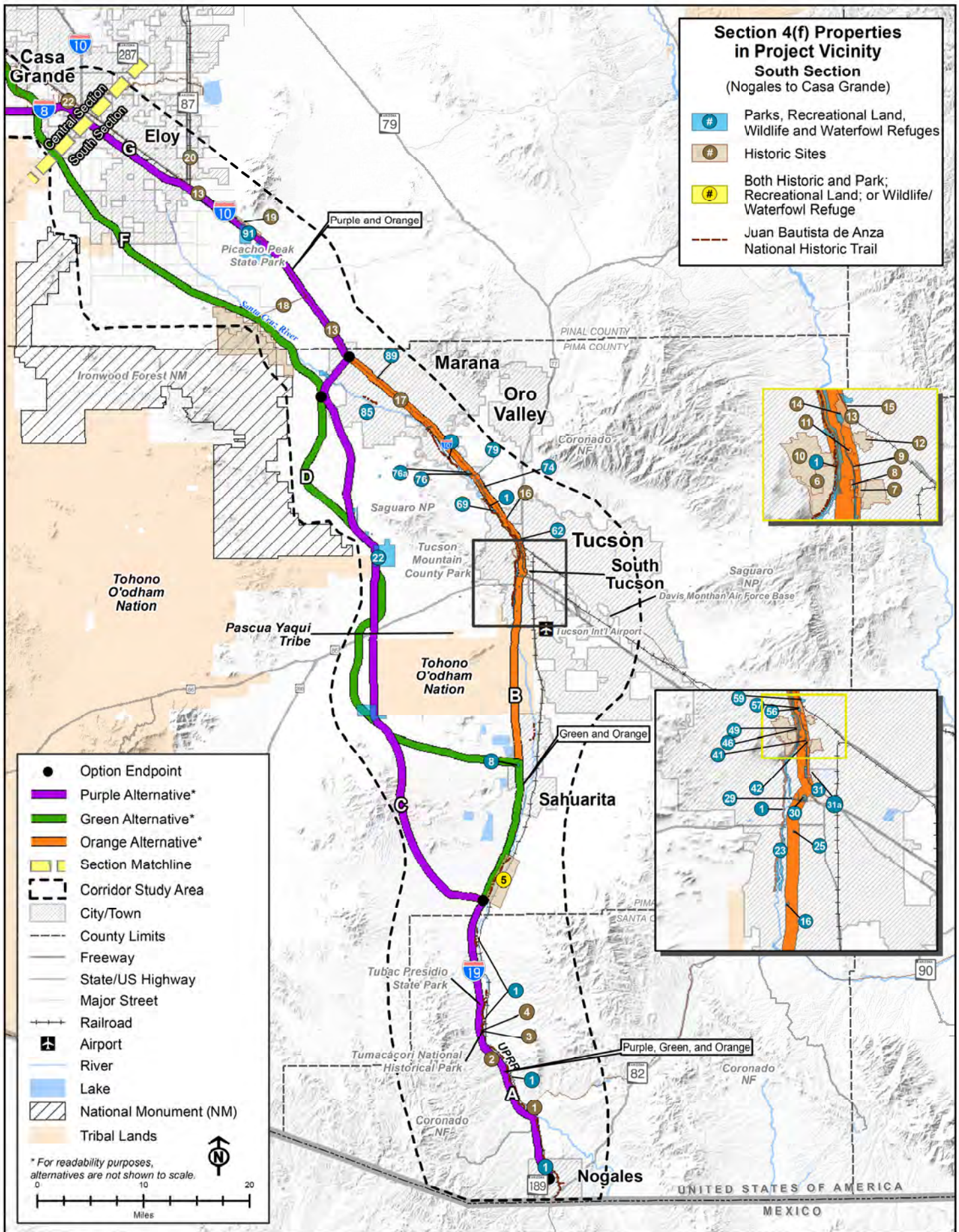


Figure 4-14. Section 4(f) Properties - Purple, Green, and Orange Alternatives - South Section

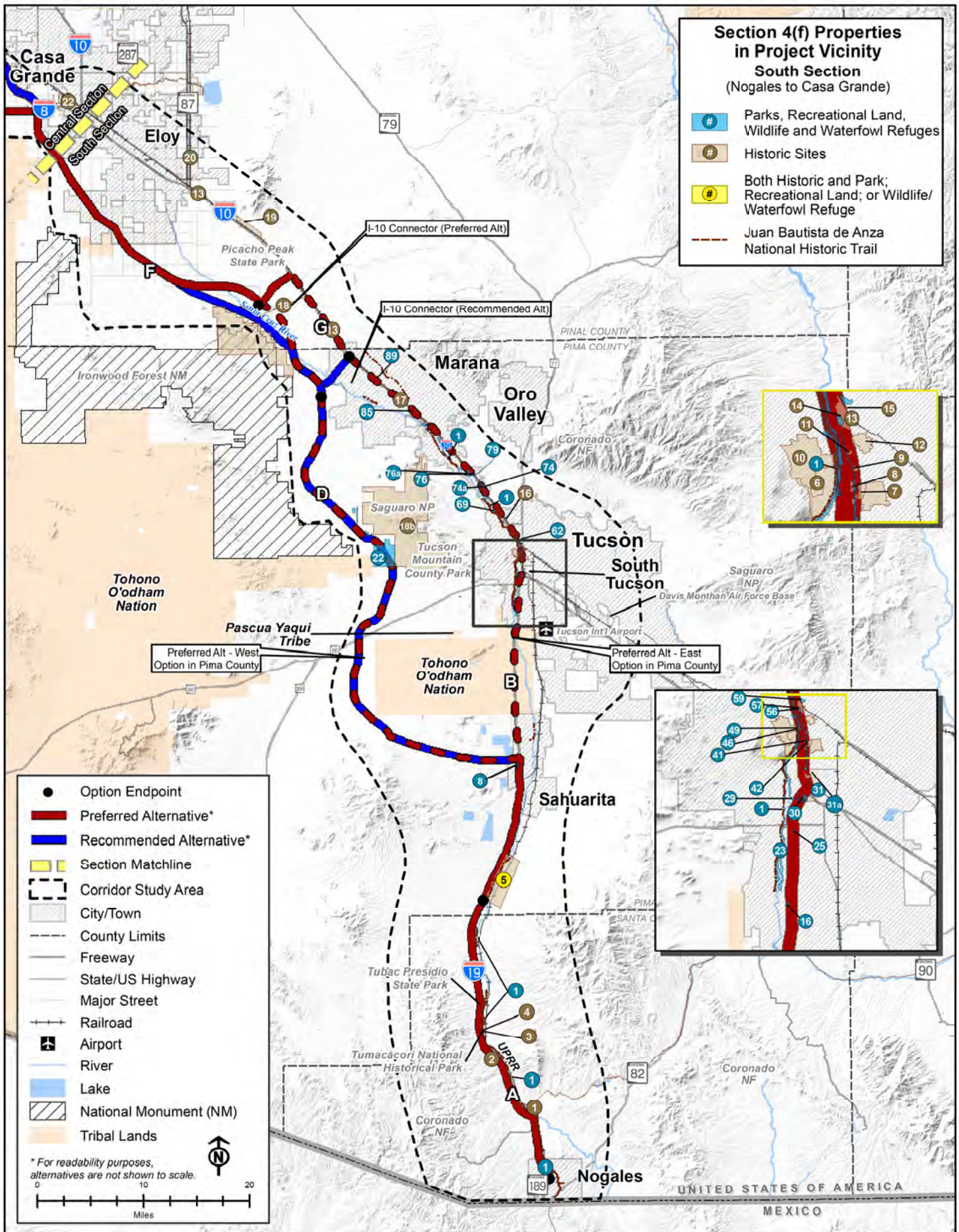


Figure 4.15. Section 4(f) Properties - Recommended and Preferred Alternatives - South Section

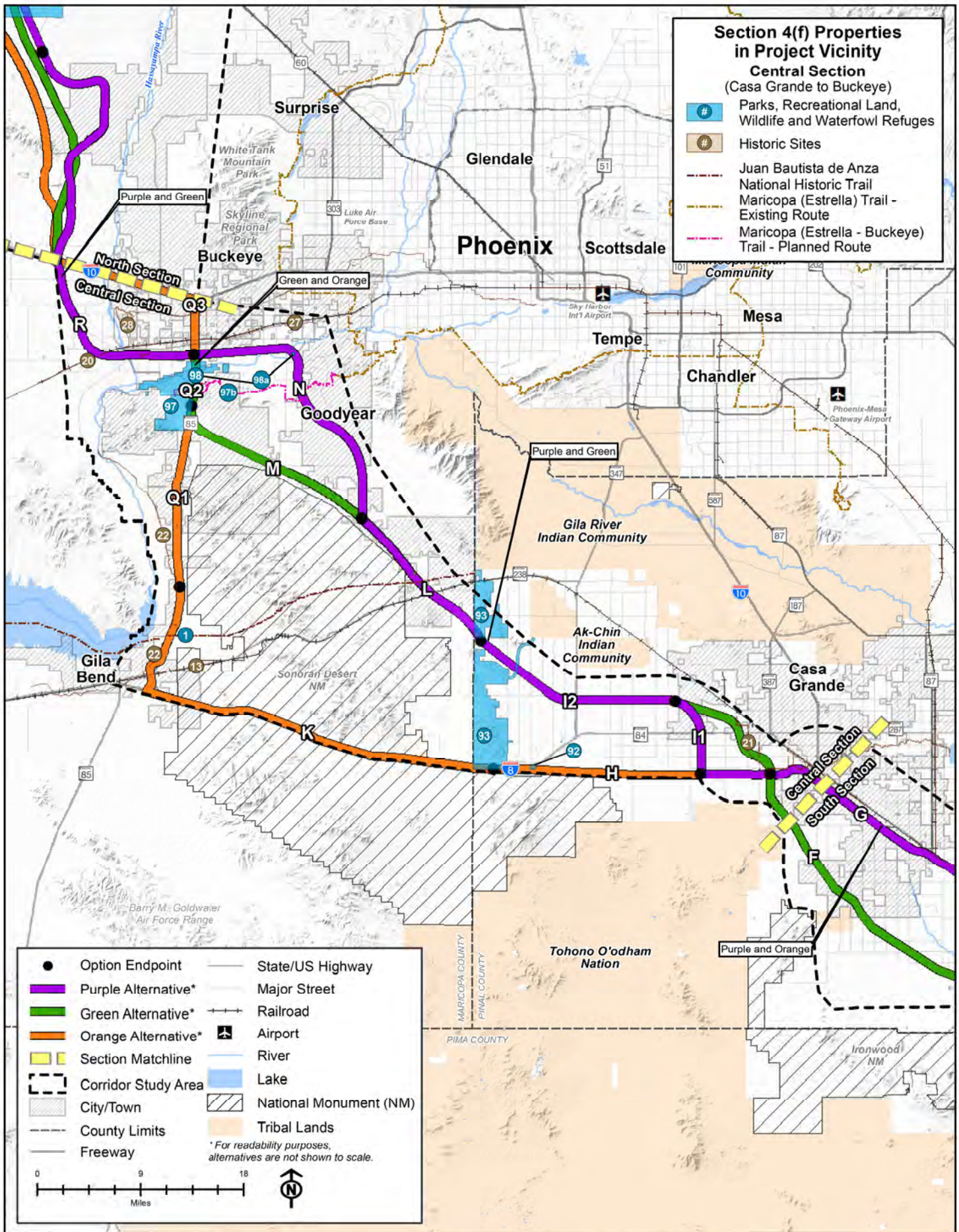


Figure 4-16. Section 4(f) Properties - Purple, Green, and Orange Alternatives -Central Section

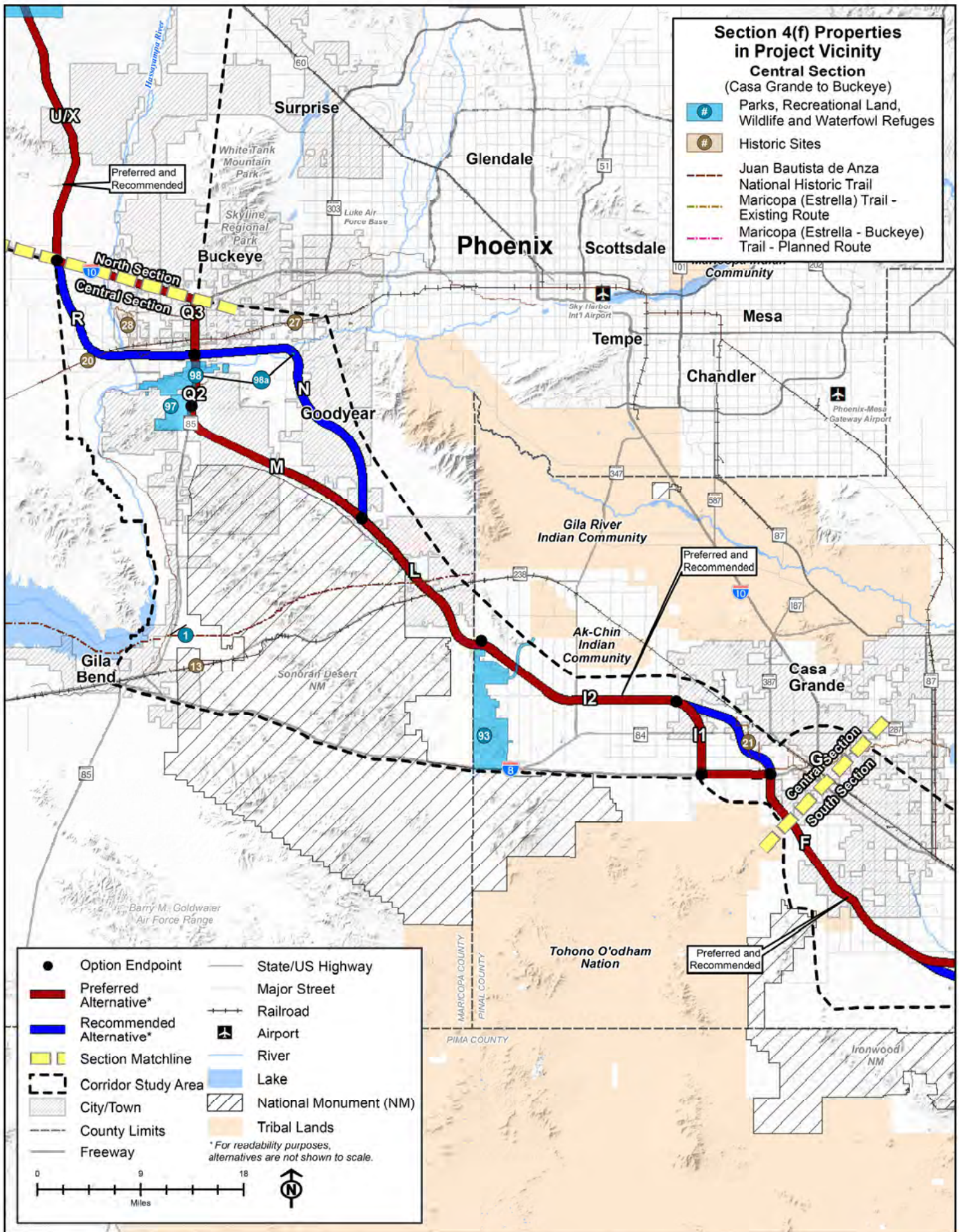


Figure 4.17. Section 4(f) Properties - Recommended and Preferred Alternatives - Central Section

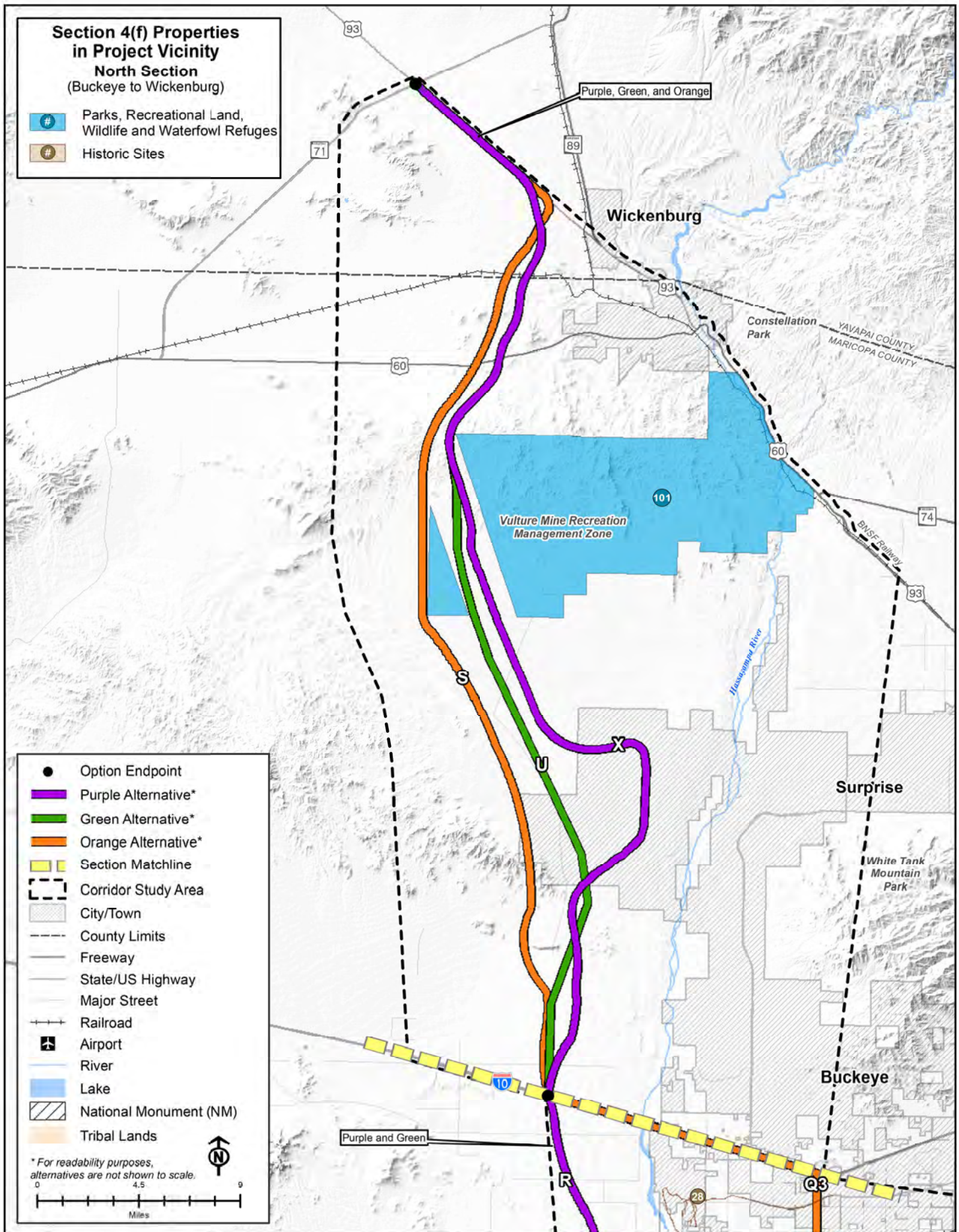


Figure 4-18. Section 4(f) Properties - Purple, Green, and Orange Alternatives -North Section

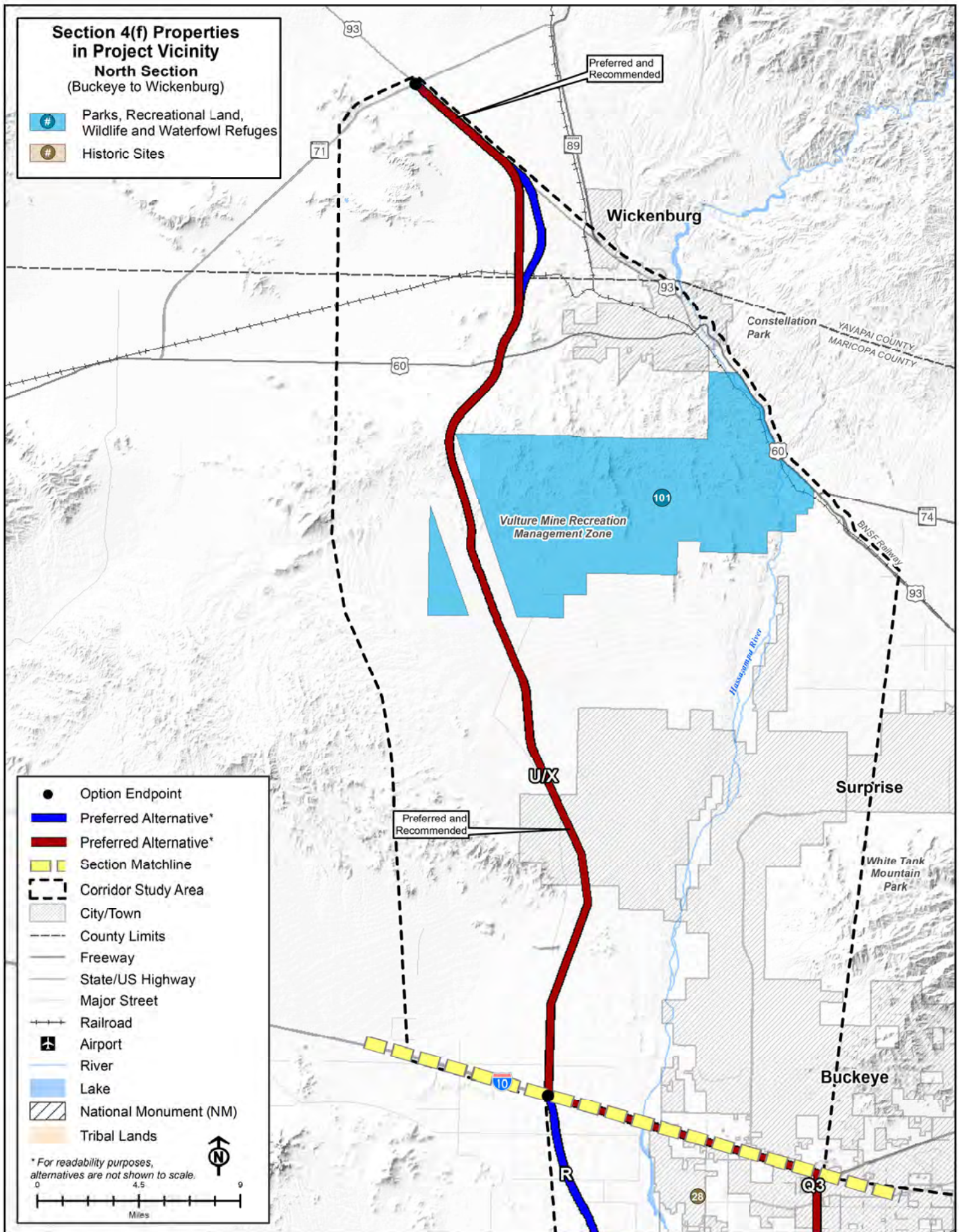


Figure 4-19. Section 4(f) Properties - Recommended and Preferred Alternatives -North Section



1 **4.6.2.3 Accommodate in the Corridor**

2 For Section 4(f) properties that occur partially or entirely within a Build Corridor Alternative, as
3 indicated in **Table 4-5**, FHWA examined the corridor in the area of each of these properties and
4 evaluated:

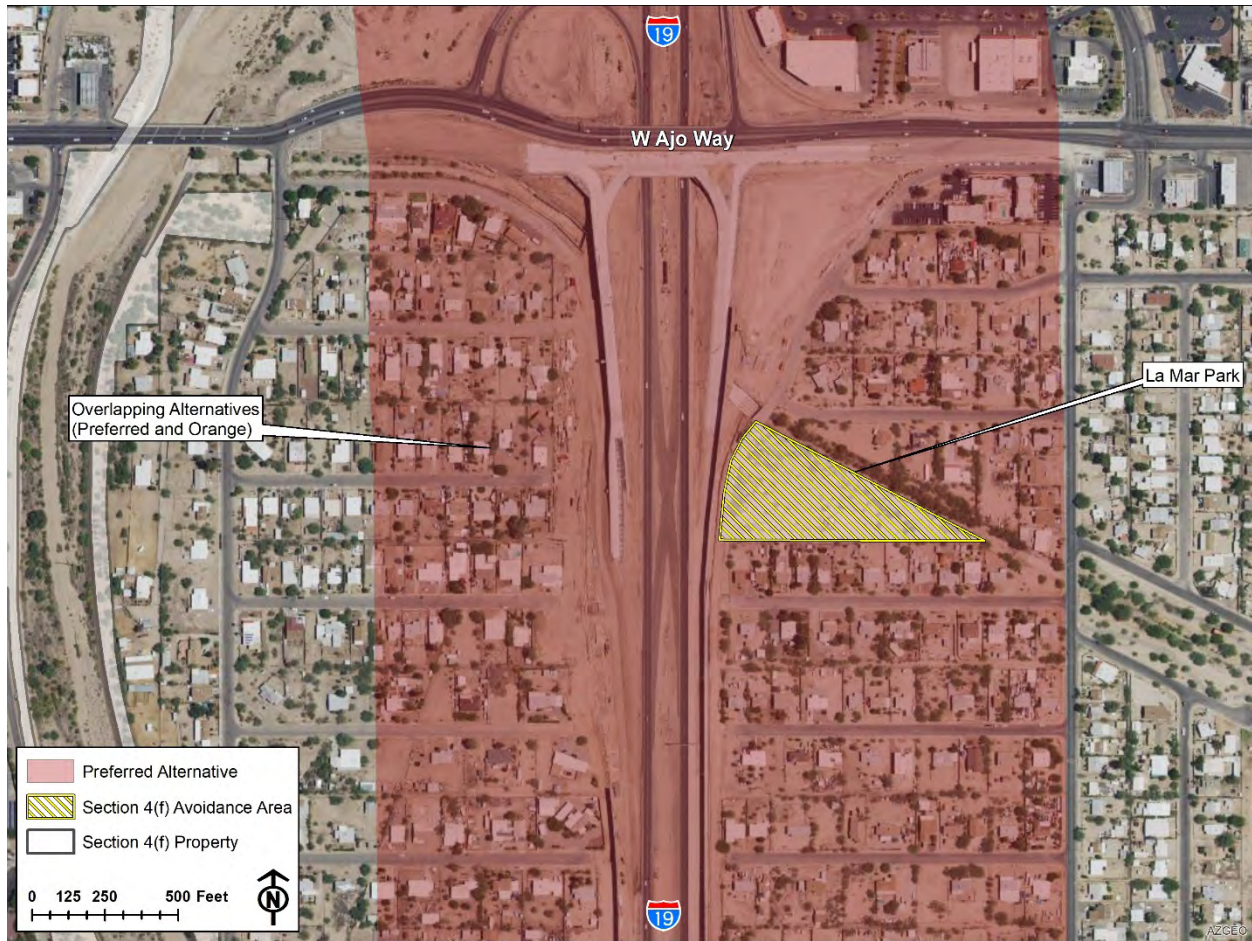
- 5 • Type, configuration, and extent of the property within the corridor
- 6 • General highway design requirements that would apply to the I-11 Corridor Project,
7 including allowance for an approximately 400-foot right-of-way width
- 8 • Other, non-Section 4(f) opportunities and constraints in the property area that were identified
9 by the Final Tier 1 EIS

10 For each property identified in **Table 4-5** as having the potential to be avoided by
11 accommodation, FHWA identified the opportunity during Tier 2 studies to accommodate an
12 approximately 400-foot right-of-way for I-11 within each Build Corridor Alternative while avoiding
13 the Section 4(f) property that occurs within the corridor. The appropriateness and compatibility
14 of avoiding each Section 4(f) property by the future project design would be evaluated and
15 determined during Tier 2 studies in coordination with the officials with jurisdiction. Consistent
16 with 23 CFR 774.7(e)(1), opportunities to minimize harm to the property at subsequent stages in
17 the project development process (for example, Tier 2) are not precluded by this Tier 1
18 evaluation. Based on this revised Draft Preliminary Section 4(f) Evaluation, the land area
19 occupied by each property and other environmental constraints would not obstruct or preclude
20 the ability to provide a highway alignment that achieves general engineering design standards in
21 the portion of the corridor outside the boundaries of the properties. As a result of the ability to
22 avoid these properties, FHWA commits that no use of the accommodated properties as defined
23 by Section 4(f) would occur as a result of the I-11 Corridor Project. **Figure 4-20** through **Figure**
24 **4-36** show each Section 4(f) property that can be avoided through accommodation in a Build
25 Corridor Alternative. Archaeological sites are not included in the graphics because that
26 information is confidential in order to protect the sites.

27

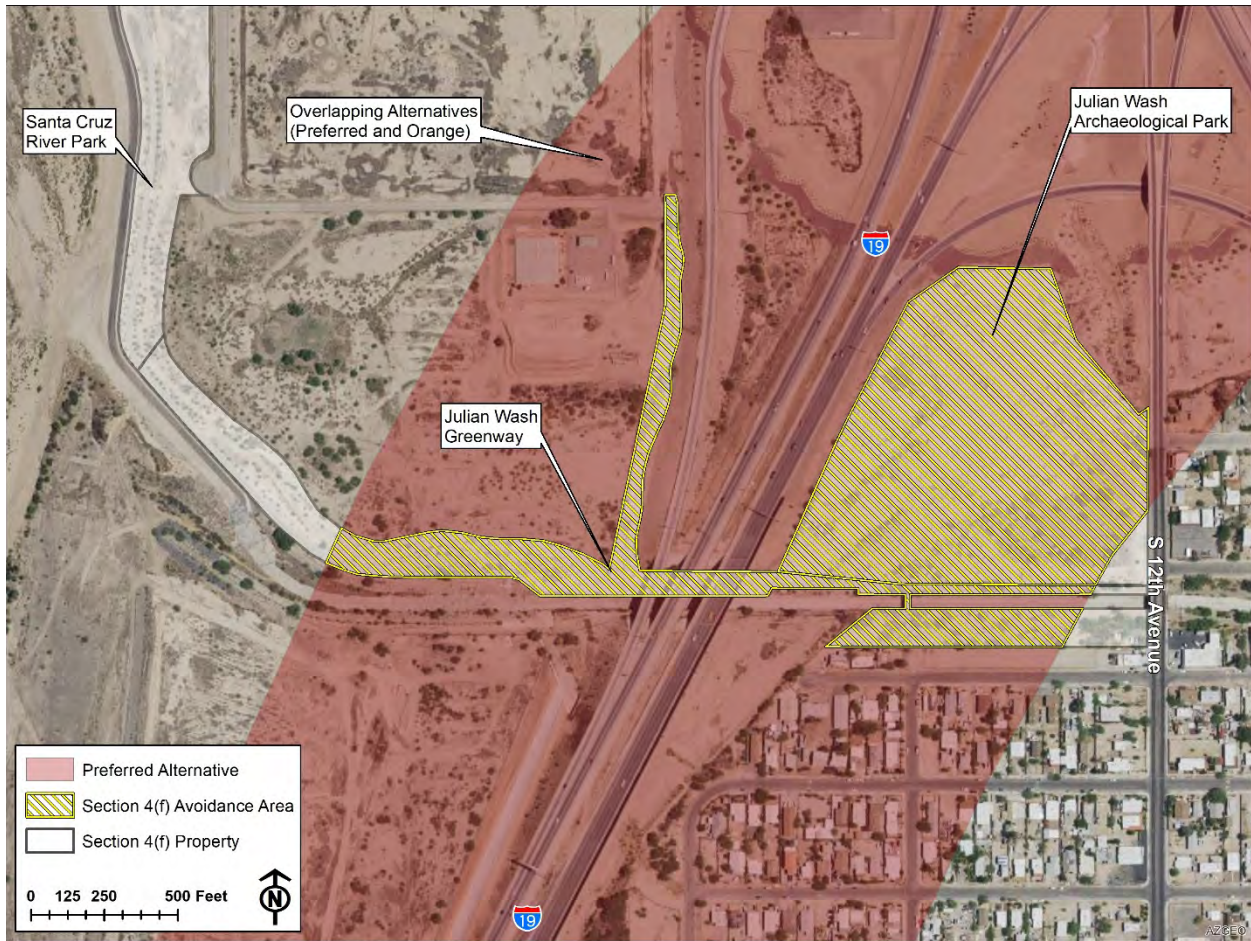


Figure 4-20. Pima Community College Desert Vista Campus – Preferred Alternative East Option or Orange Alternative (Accommodate in the Corridor)



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Figure 4-21. La Mar Park – Preferred Alternative East Option and Orange Alternative (Accommodate in the Corridor)



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Figure 4-22. Julian Wash Greenway and Archaeological Park – Preferred Alternative East Option and Orange Alternative (Accommodate in the Corridor)

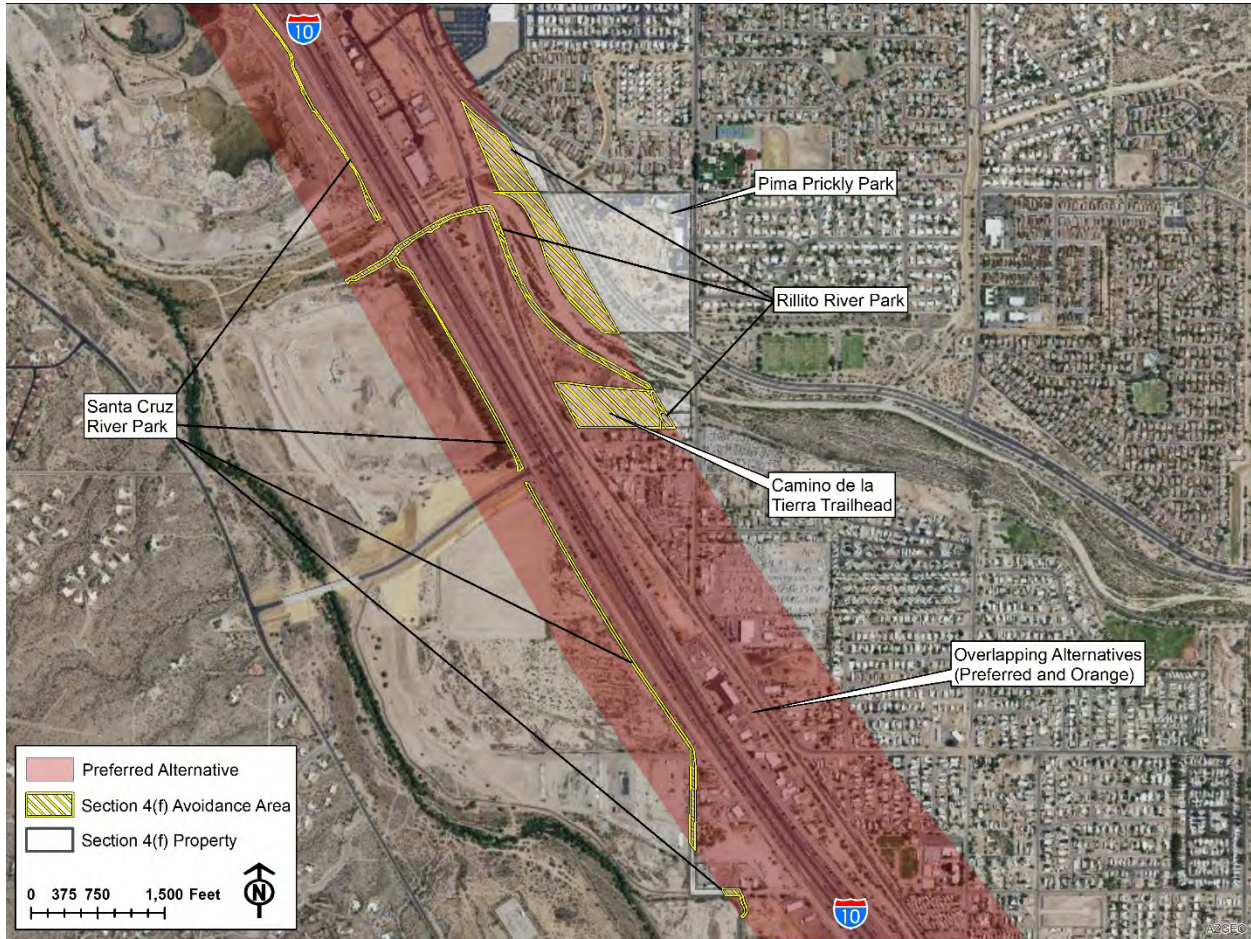


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Figure 4-23. Francisco Elias Esquer Park – Preferred Alternative East Option and Orange Alternative (Accommodate in the Corridor)

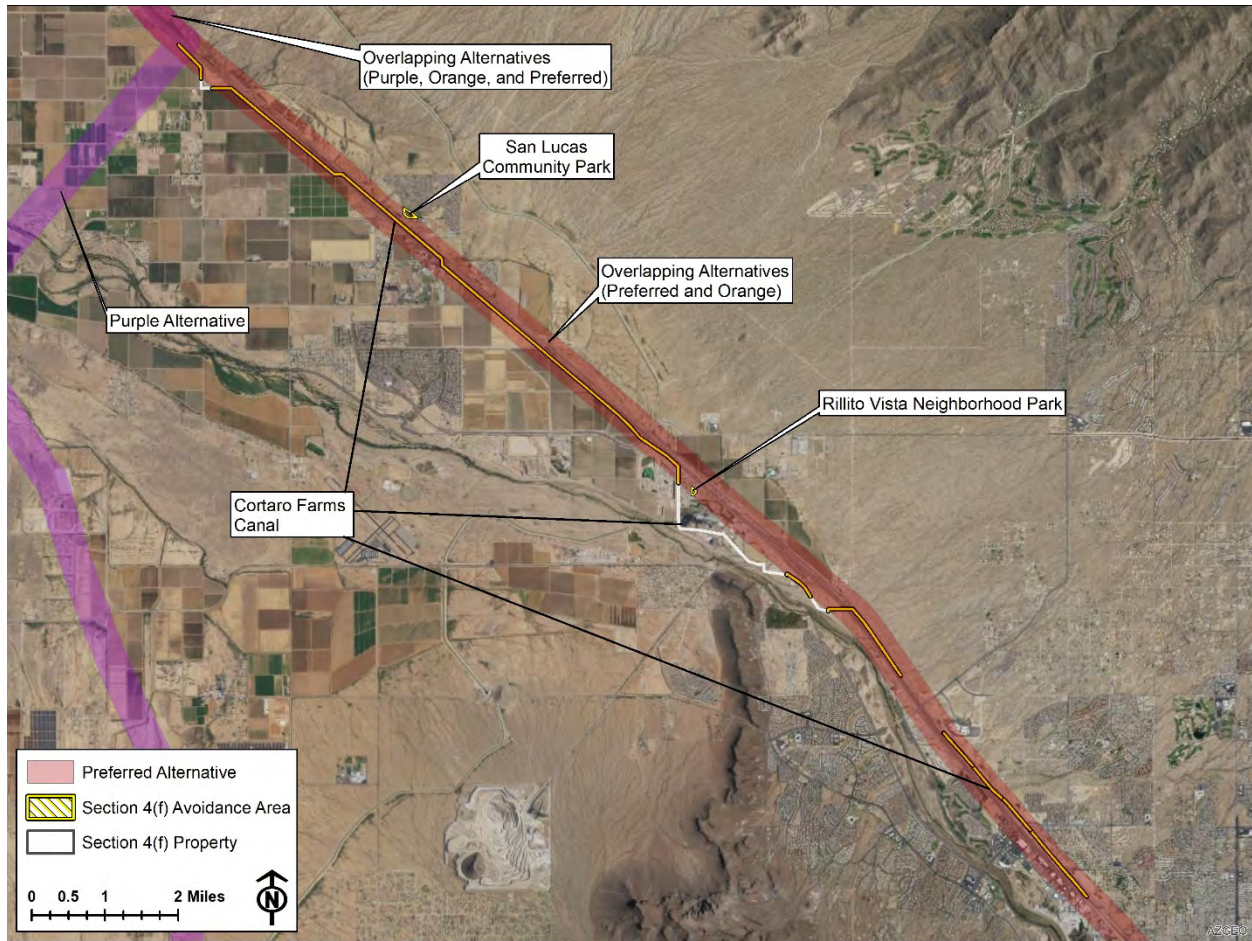


1
 2 **Figure 4-24. Sweetwater Wetlands Park and USDA Tucson Plant Materials Center**
 3 **– Preferred Alternative East Option and Orange Alternative (Accommodate in the**
 4 **Corridor)**



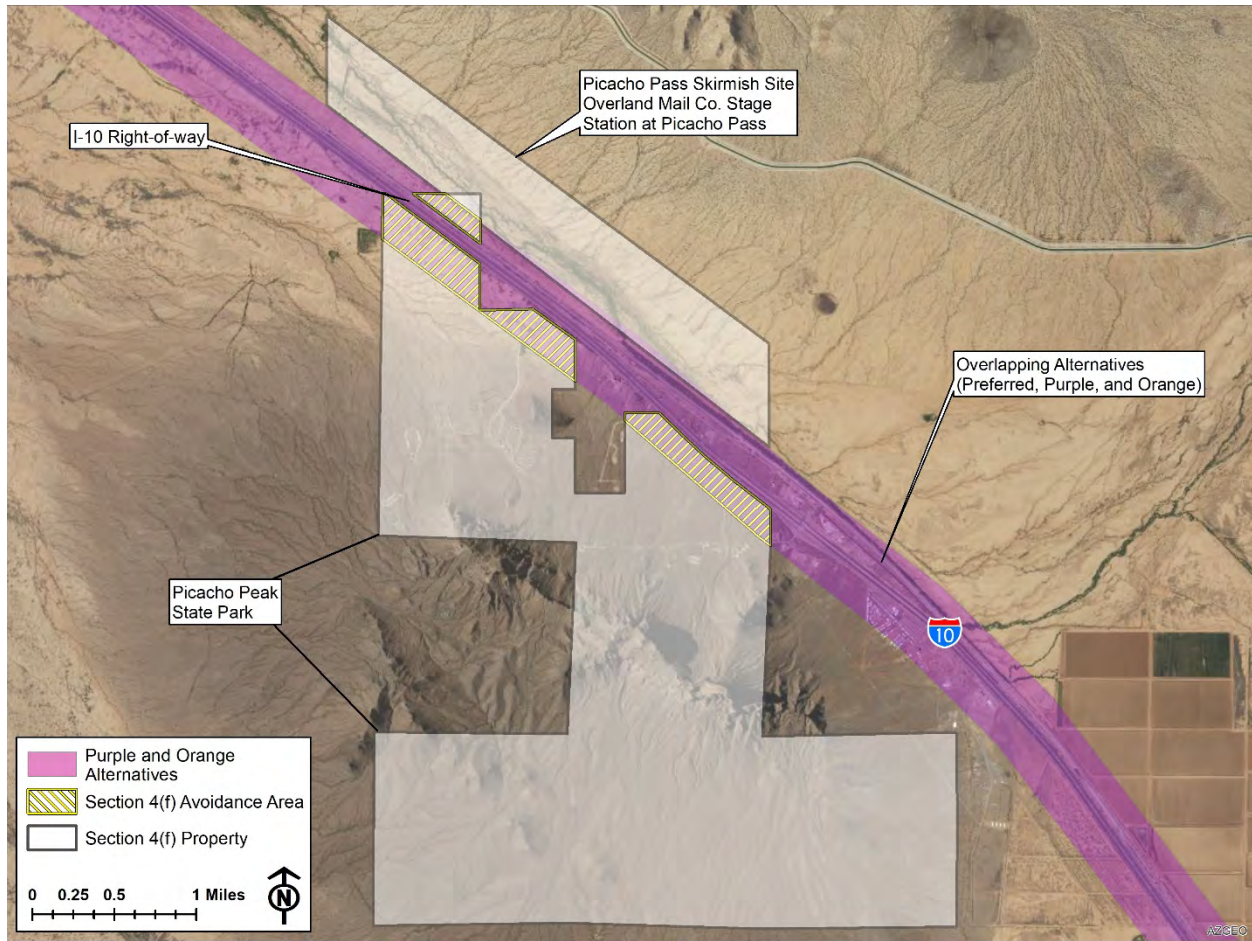
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Figure 4-25. Rillito River Park, Pima Prickly Park, and Camino de la Tierra Trailhead – Preferred Alternative East Option and Orange Alternative (Accommodate in the Corridor)



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Figure 4-26. Cortaro Farms Canal – Preferred Alternative East Option or Orange Alternative (Accommodate in the Corridor)



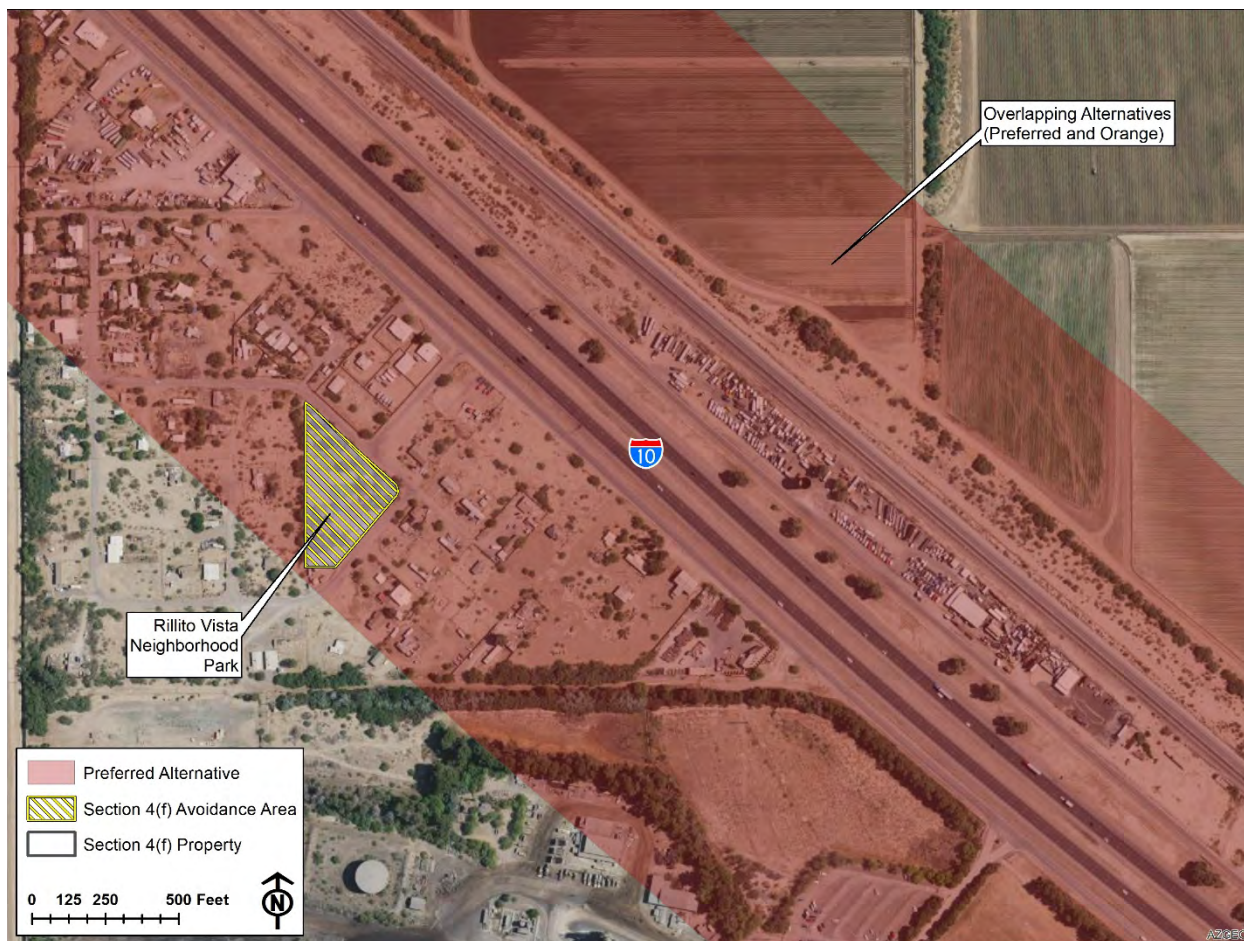
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Figure 4-27. Picacho Peak State Park and Picacho Pass Skirmish Site - Overland Mail Co. Stage Station – Preferred, Purple, or Orange Alternative (Accommodate in the Corridor)



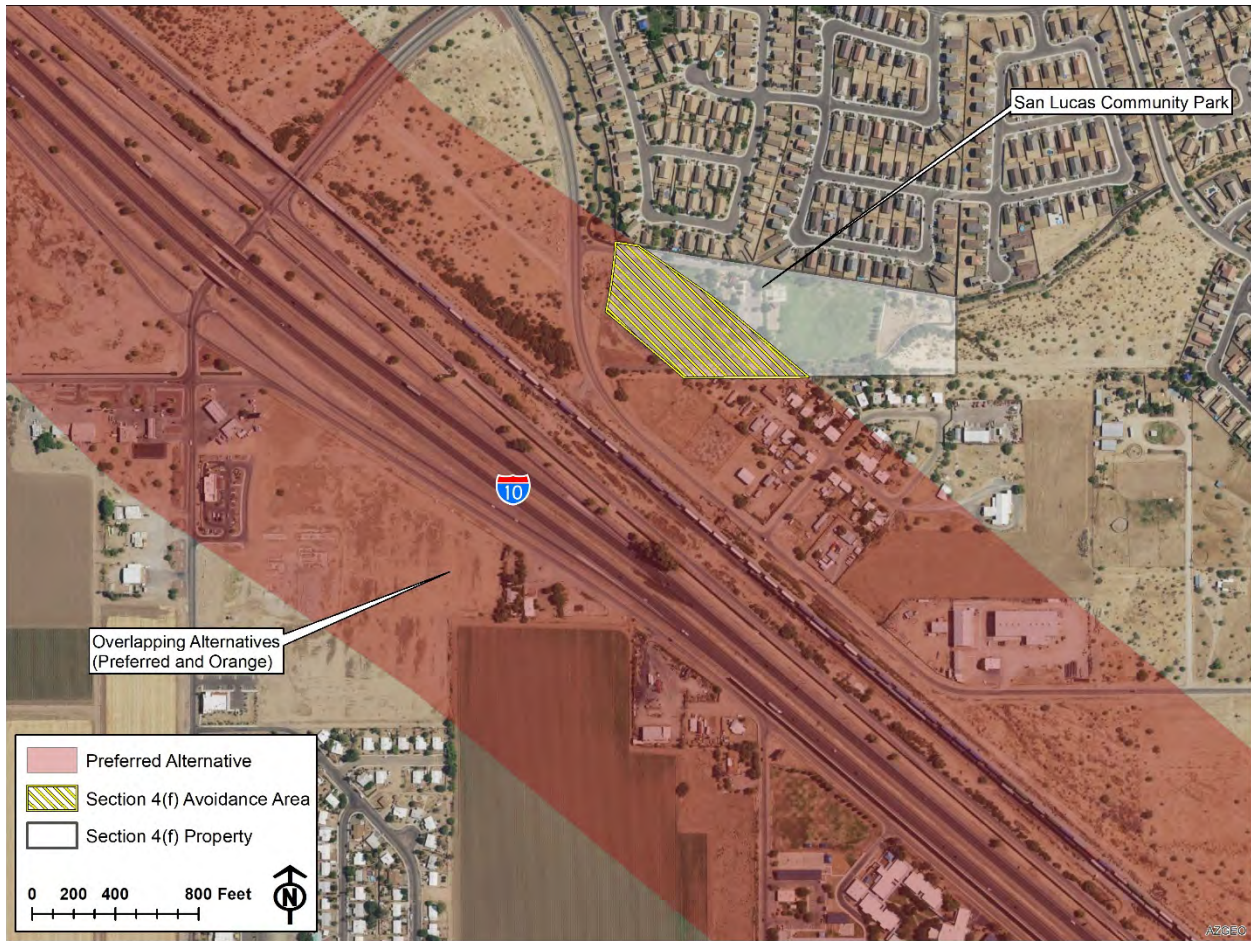
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2 **Figure 4-28. Cañada del Oro (Christina-Taylor Green Memorial River Park), Ted**
3 **Walker Park, Mike Jacob Sports Park, and Santa Cruz River Park – Preferred**
4 **Alternative East Option and Orange Alternative (Accommodate in the Corridor)**

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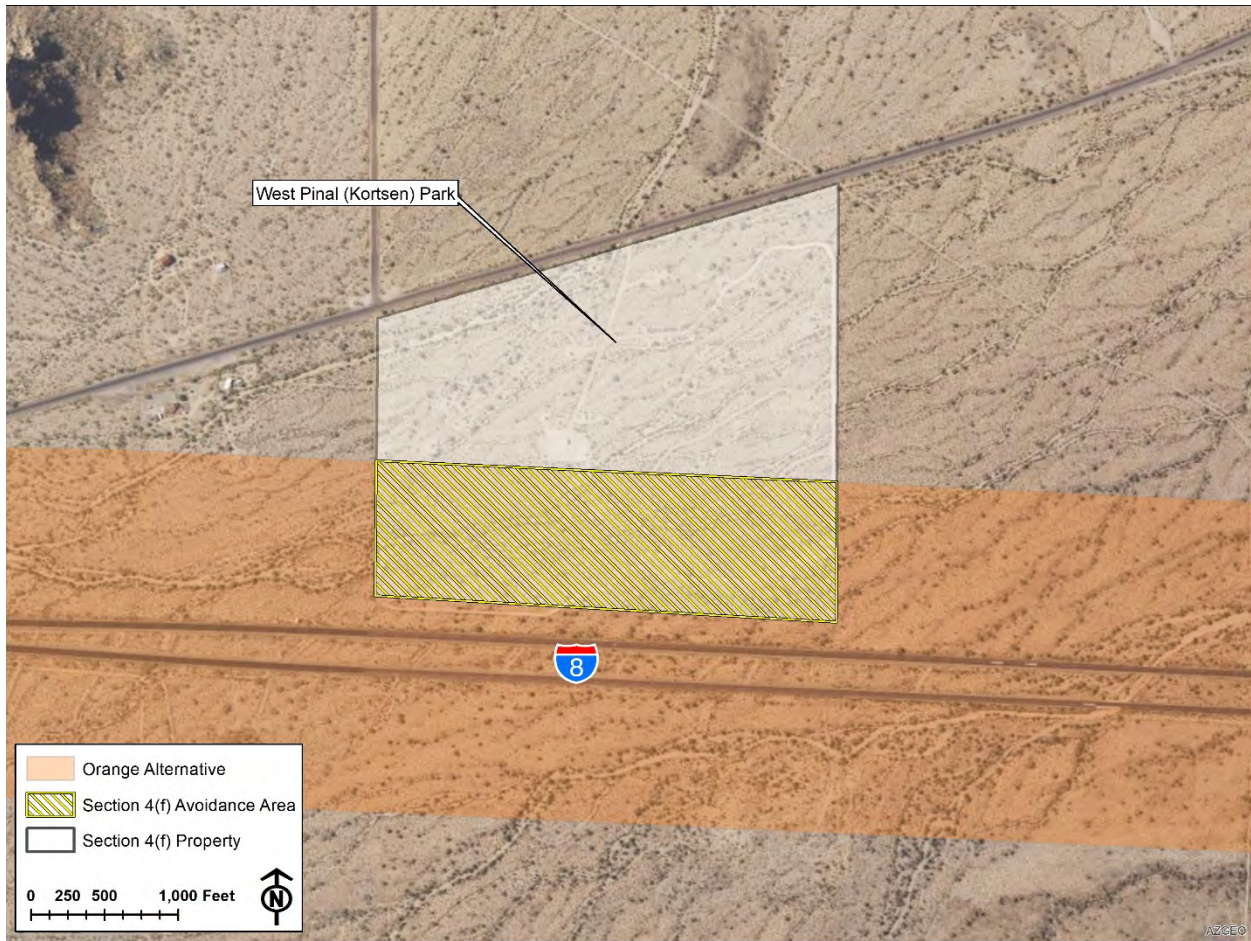
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2 **Figure 4-29. Rillito Vista Neighborhood Park – Preferred Alternative East Option**
3 **and Orange Alternative (Accommodate in the Corridor)**

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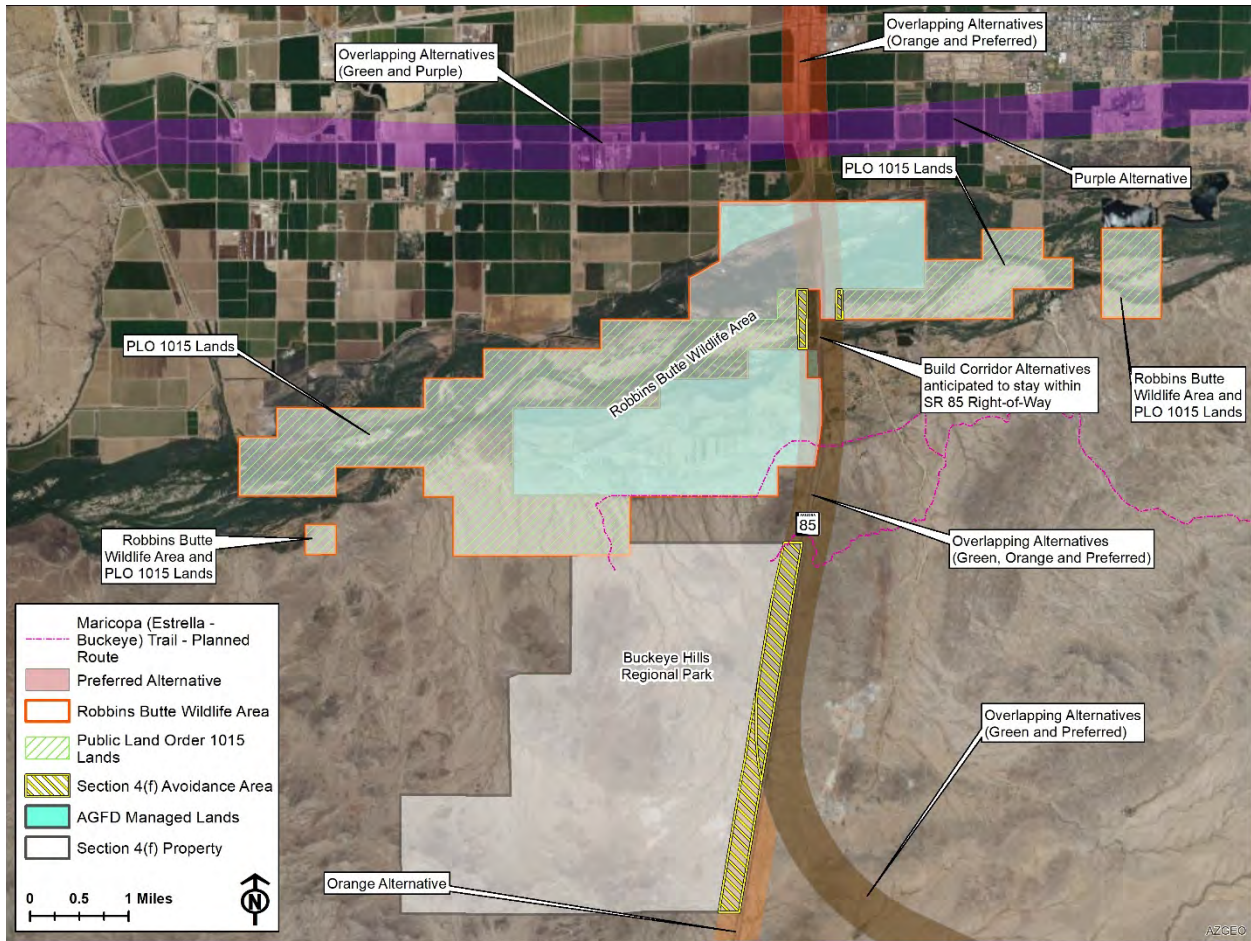
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Figure 4-30. San Lucas Community Park – Preferred Alternative East Option and Orange Alternative (Accommodate in the Corridor)



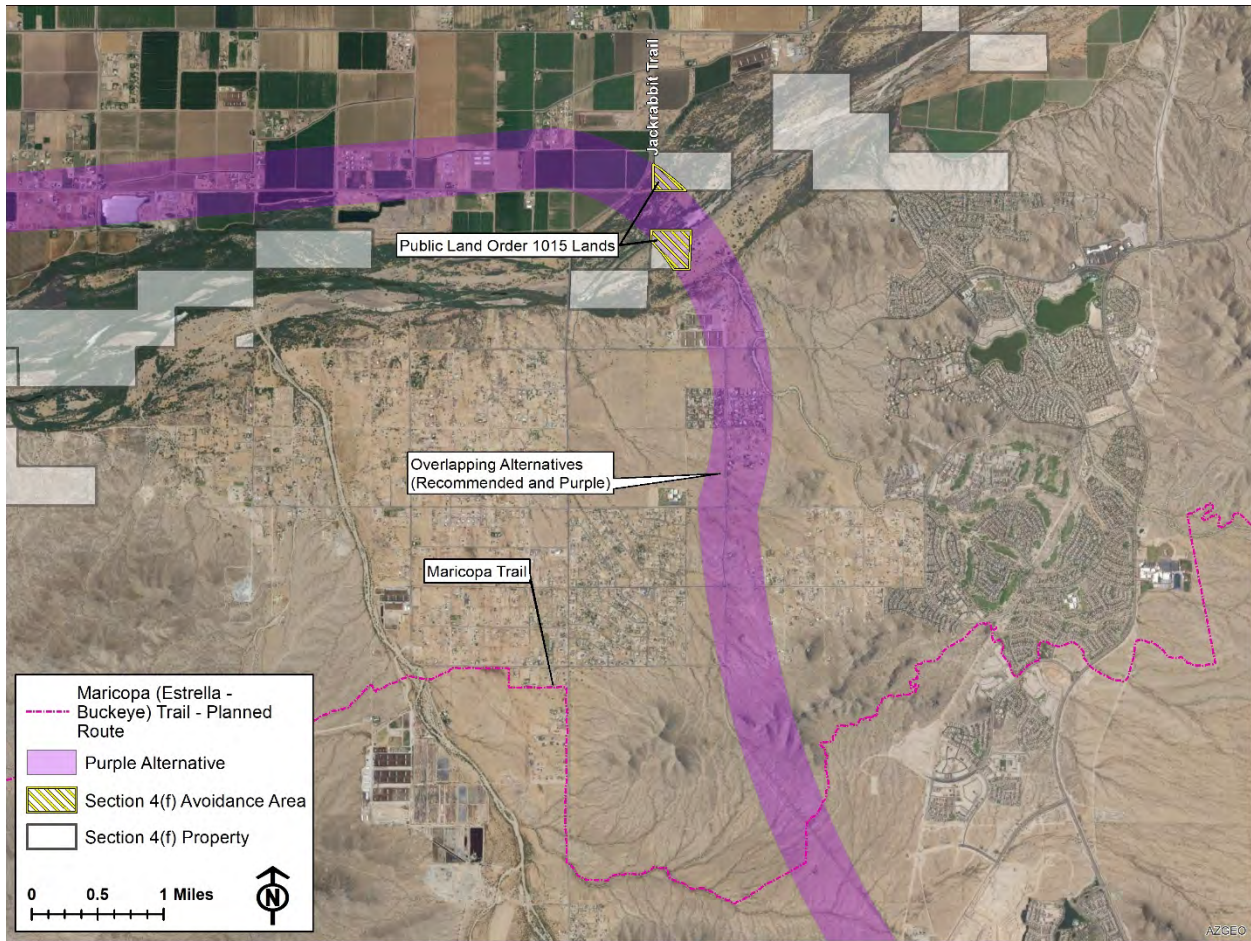
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Figure 4-31. West Pinal (Kortsen) Park – Orange Alternative (Accommodate in the Corridor)



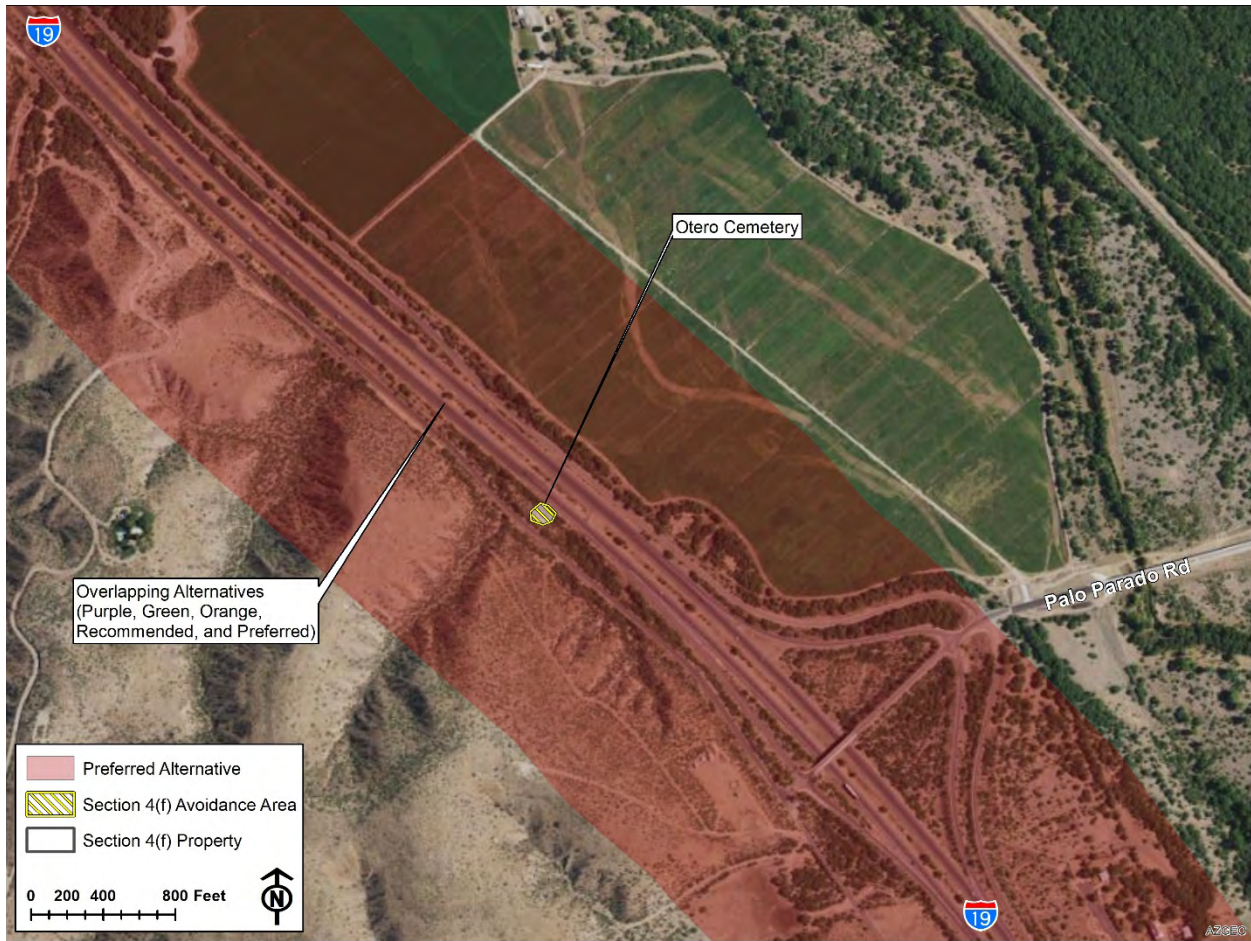
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Figure 4-32. Buckeye Hills Regional Park – Accommodate (Preferred, Green, or Orange Alternative); Robbins Butte Wildlife Area – No Use or Potential De Minimis Use (Recommended, Preferred, Green, Orange Alternative); and Public Land Order 1015 Lands – Accommodate (Recommended, Preferred, Purple, Green, or Orange Alternative)



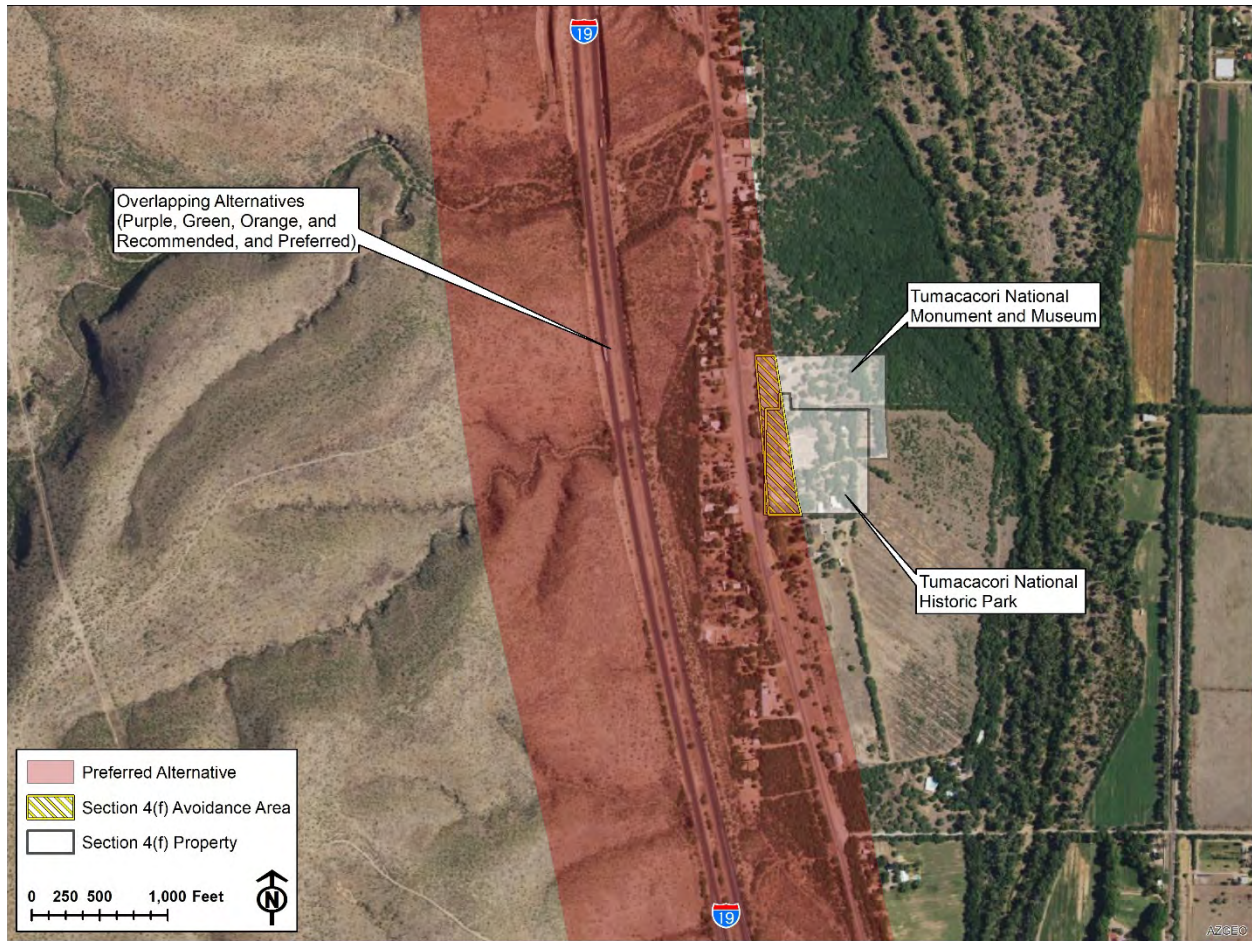
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Figure 4-33. Public Land Order 1015 Land Parcels and Maricopa Trail – Recommended or Purple Alternative (Accommodate in the Corridor)



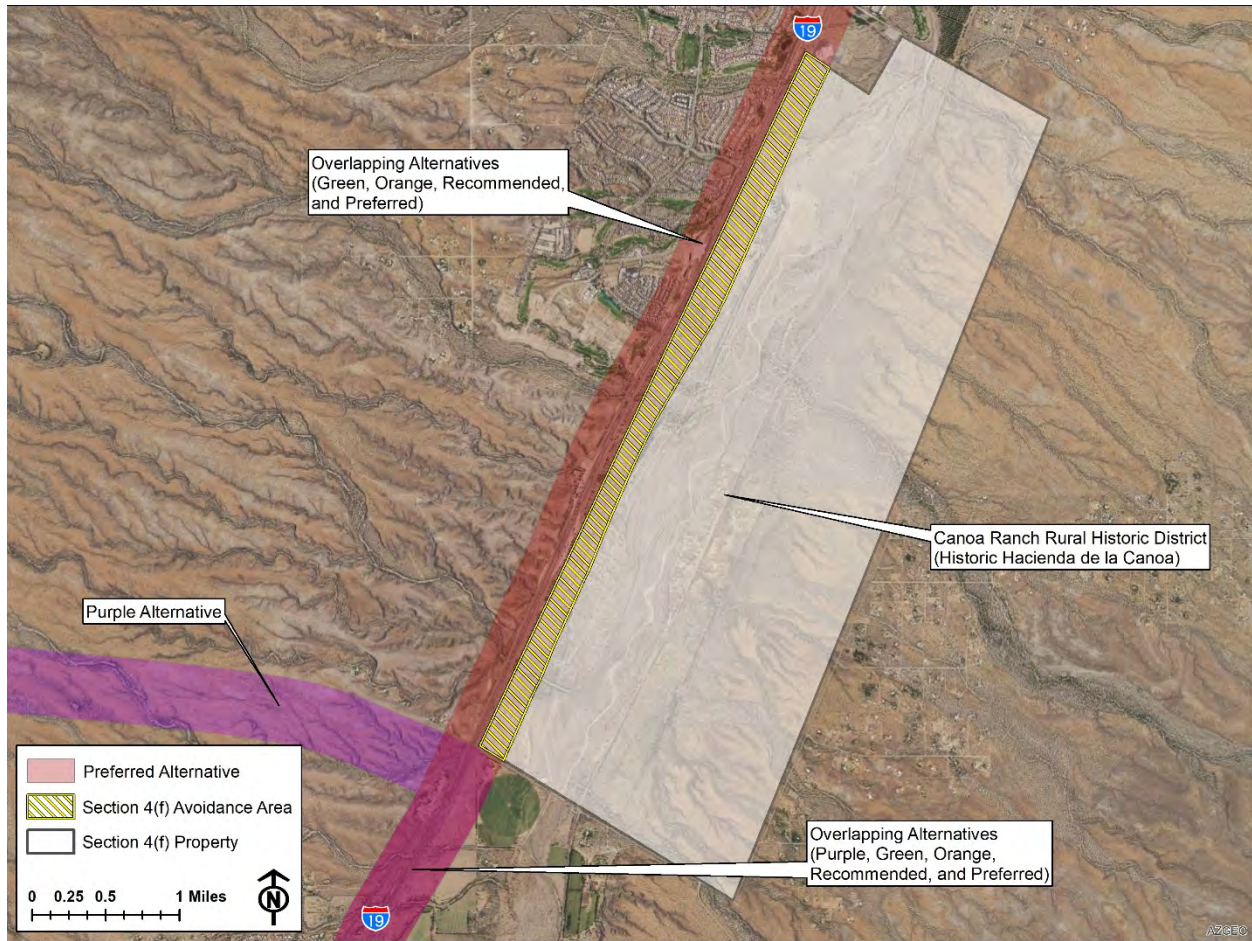
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Figure 4-34. Otero Cemetery – Preferred, Recommended, Purple, Green, or Orange Alternative (Accommodate in the Corridor)



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Figure 4-35. Tumacacori National Historic Park and Tumacacori National Monument and Museum – Preferred, Recommended, Purple, Green, or Orange Alternative (Accommodate in the Corridor)



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Figure 4-36. Canoa Ranch Rural Historic District (Historic Hacienda de la Canoa) – Preferred, Recommended, Green, and Orange Alternatives (Accommodate in the Corridor)



1 **4.6.2.4 Shift the Corridor**

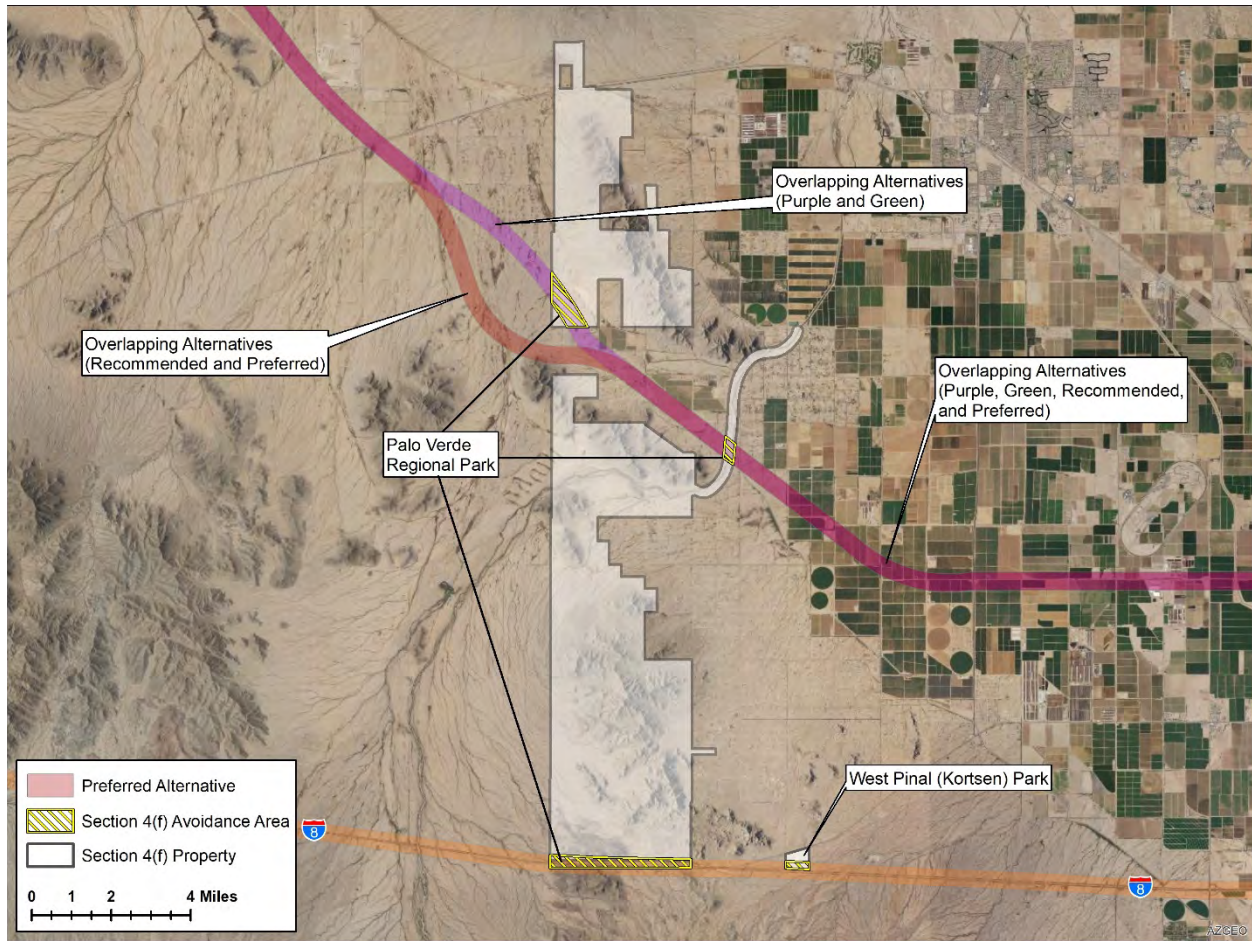
2 FHWA and ADOT identified an opportunity to avoid two properties by shifting the corridor to
3 provide the 400-foot-wide right-of-way allowance for I-11 outside the boundaries of these
4 properties:

- 5 • **Palo Verde Regional Park.** The property occupies portions of the Preferred,
6 Recommended, Purple, and Green Alternatives, obstructing or precluding the ability to
7 provide a highway alignment in that portion of each corridor. To avoid Palo Verde Regional
8 Park, FHWA and ADOT shifted the Recommended and Preferred Alternatives corridors as
9 shown on **Figure 4-37**. Purple and Green Alternatives could be similarly shifted to avoid the
10 park. The Preferred, Recommended, Purple, and Green Alternatives would also cross a
11 narrow part of the park property that connects the two park parcels; ADOT would grade-
12 separate the highway at the crossing to avoid impacting this portion of the park.

- 13 • **Anamax Park.** The property occupies portions of the Preferred, Recommended, Green, and
14 Orange Alternatives, obstructing or precluding the ability to provide a highway alignment in
15 those portions of each corridor. In these cases, to accommodate Anamax Park, FHWA and
16 ADOT shifted the corridor to the east, as shown on **Figure 4-38**.

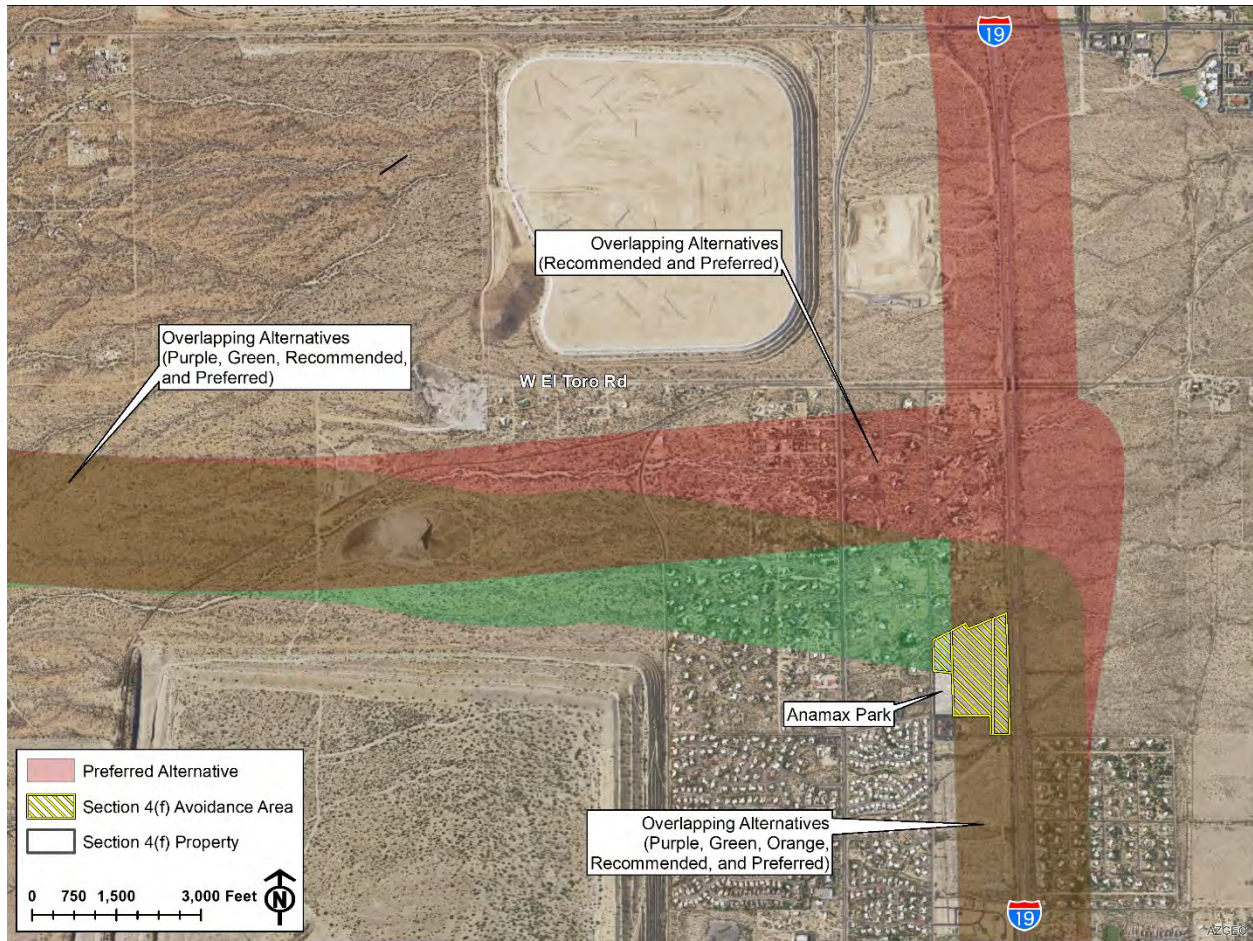
17 In addition, consistent with 23 CFR 774.7(e)(1), opportunities to minimize harm to the properties
18 at subsequent stages in the project development process (for example, Tier 2) are not
19 precluded. The land area occupied by each property and other environmental constraints would
20 not obstruct or preclude the ability to provide a highway alignment that achieves general
21 engineering design standards in the shifted portion of the corridor. As a result of the ability to
22 avoid these properties, FHWA commits that no use of Palo Verde Regional Park and Anamax
23 Park as defined by Section 4(f) would occur as a result of the I-11 Corridor Project.

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Figure 4-37. Palo Verde Regional Park – Preferred, Recommended, Purple, or Green Alternative (Shift the Corridor)



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Figure 4-38. Anamax Park – Preferred, Recommended, Green, or Orange Alternative (Shift the Corridor)



1 **4.6.2.5 Grade-Separate the Corridor - Linear Properties: Trails, Historic Canals, and**
2 **Historic Railroads**

3 Twelve Section 4(f)-protected trails, historic canals, and historic railroads cross the Build
4 Corridor Alternatives:

- 5 • Built segments of the Juan Bautista de Anza National Historic Trail (Preferred Alternative
6 west option, Recommended, or Purple Alternative)
- 7 • Julian Wash Greenway (Preferred Alternative east option or Orange Alternative)
- 8 • El Paso and Southwestern Greenway, existing trail (Preferred Alternative east option or
9 Orange Alternative)
- 10 • Rillito River Park (Preferred Alternative east option or Orange Alternative)
- 11 • Palo Verde Regional Park (Recommended Alternative, Preferred Alternative west option,
12 Preferred Alternative east option, Purple Alternative, or Green Alternative)
- 13 • Maricopa Trail – Planned Route (Recommended Alternative, Preferred Alternative west
14 option, Preferred Alternative east option, Purple Alternative, Green Alternative, or Orange
15 Alternative)
- 16 • Cortaro Farms Canal/Cortaro-Marana Irrigation District Canal (Purple Alternative)
- 17 • Casa Grande Canal (Recommended Alternative)
- 18 • Gila Bend Canal (Purple Alternative or Orange Alternative)
- 19 • Butterfield Overland Mail stage route (Recommended Alternative, Preferred Alternative west
20 option, Preferred Alternative east option, Purple Alternative, Green Alternative, or Orange
21 Alternative)
- 22 • Buckeye Canal (Recommended Alternative, Preferred Alternative west option, Preferred
23 Alternative east option, Purple Alternative, Green Alternative, or Orange Alternative)
- 24 • Roosevelt Canal (Recommended Alternative, Preferred Alternative west option, Preferred
25 Alternative east option, Purple Alternative, Green Alternative, or Orange Alternative)

26 All the properties listed above can be avoided though grade-separation or other means.
27 Elevating the roadway corridor on a structure that passes over and spans the linear property or
28 depressing the roadway corridor under a structure that carries the property over the roadway
29 would eliminate the need to incorporate land from the Section 4(f) property. In addition, grade
30 separation would preserve the activities, features, and attributes of the linear property that
31 qualify it for protection under Section 4(f).

32 The land area occupied by each property and other environmental constraints would not
33 obstruct or preclude the ability to provide a highway alignment that achieves general
34 engineering design standards in a grade-separated alignment while avoiding each linear



1 property. As a result of the ability to avoid these properties, FHWA commits that no use of the
2 linear properties as defined by Section 4(f) would occur as a result of the I-11 Corridor Project.

3 **4.6.3 Build Corridor Alternatives – Use Evaluation**

4 The revised Draft Preliminary Section 4(f) Evaluation identified the potential for use of the
5 following Section 4(f) properties by the Build Corridor Alternatives, as shown in **Table 4-4**.

- 6 • Robbins Butte Wildlife Area (Preferred, Green, or Orange Alternatives)
- 7 • Downtown Tucson properties:
 - 8 ○ Santa Cruz River Park (Preferred Alternative east option or Orange Alternative)
 - 9 ○ El Paso and Southwestern Greenway, Planned Trail (Preferred Alternative east option or
10 Orange Alternative)
 - 11 ○ David G. Herrera and Ramon Quiroz Park (Preferred Alternative east option or Orange
12 Alternative)
 - 13 ○ Barrio El Membrillo Historic District (Preferred Alternative east option or Orange
14 Alternative)
 - 15 ○ El Paso and Southwestern Railroad District (Preferred Alternative east option or Orange
16 Alternative)
 - 17 ○ Levi H. Manning House (Preferred Alternative east option or Orange Alternative)
 - 18 ○ Barrio Anita Historic District (Preferred Alternative east option or Orange Alternative)
- 19 • Tucson Mitigation Corridor (Preferred, Recommended, Purple, or Green Alternative)

20 During Tier 2 studies, historic and archaeological resources will be surveyed, Section 106
21 consultation will be undertaken, and a Final Section 4(f) Evaluation will be conducted. The
22 findings of this revised Draft Preliminary Section 4(f) Evaluation could be refined during Tier 2 if
23 additional Section 4(f) resources are identified at that time. Tier 2 activities will include
24 examination of means to avoid, mitigate, and/or minimize harm to protected resources.

25 Each property is evaluated in the following subsections, including analyses of avoidance and all
26 possible planning to minimize harm to the level that this first-tier EIS stage allows.

27 **4.6.3.1 Robbins Butte Wildlife Area – No Use or Possible De Minimis Use (Preferred, 28 Green, or Orange Alternatives)**

29 The Robbins Butte Wildlife Area consists of multiple parcels of undeveloped land on both sides
30 of SR 85 at the existing Gila River crossing (**Figure 4-32**). The land is preserved and managed
31 for wildlife and wildlife habitat by AGFD. The preserved wildlife habitats are the features,
32 attributes, or activities that qualify the property for protection under Section 4(f).



1 The Preferred, Green, and Orange Alternatives are aligned on SR 85 at the existing Gila River
2 crossing. Preliminary analysis indicates the existing SR 85 right-of-way (**Appendix E1**
3 [Conceptual Drawings] in the Draft Tier 1 EIS) is wide enough to accommodate the proposed
4 I-11 highway cross section. However, increased traffic could increase the likelihood of wildlife
5 collisions, noise and light pollution, and runoff. Tier 2 studies involving project-level design will
6 be required to assess the nature and extent of such potential impacts, to identify and evaluate
7 the effectiveness of measures to avoid or minimize harm related to these potential impacts, and
8 to develop and apply specific measures to mitigate impacts if needed. ADOT will undertake
9 these activities in coordination with AGFD. In Tier 2, appropriate minimization and mitigation
10 measures would be included in the Final Section 4(f) determination for Robbins Butte Wildlife
11 Area as well as the Final Section 4(f) Evaluation.

12 Based on the preliminary analysis, it will be possible for FHWA to make a finding of no use or, at
13 most, a finding of *de minimis* use for this property after Tier 2 studies and consultation with
14 AGFD.

15 **4.6.3.2 Downtown Tucson Parcels – Possible Individual Uses (Preferred Alternative** 16 **East Option and Orange Alternative)**

17 **Identification of Section 4(f) Properties**

18 More than 20 historic properties and parks fall within the Preferred Alternative east option and
19 Orange Alternative in the downtown Tucson area, as shown on **Figure 4-39** and **Figure 4-40**.
20 These properties are protected by Section 4(f). **Table 4-1** describes the features and attributes
21 of each property.

22 **Proposed Use of Section 4(f) Properties**

23 To accommodate 2040 traffic demands, the Preferred Alternative east option or the Orange
24 Alternative would expand I-10 from 8 lanes to 12 to 14 lanes from the I-19 interchange to Prince
25 Road. The Preferred Alternative east option and Orange Alternative would require an estimated
26 120 feet of additional right-of-way. The 120 feet could be on either side of the existing I-10 right-
27 of-way, all on the east side of I-10, or all on the west side of I-10. In downtown Tucson, I-10 is
28 surrounded by dense, established historic communities. Properties protected by Section 4(f) are
29 in close proximity to one another and to I-10, as shown on **Figure 4-39** and **Figure 4-40**. At this
30 Tier 1 level of analysis, FHWA and ADOT assessed that It is not possible to widen I-10 without
31 impacting Section 4(f) properties.

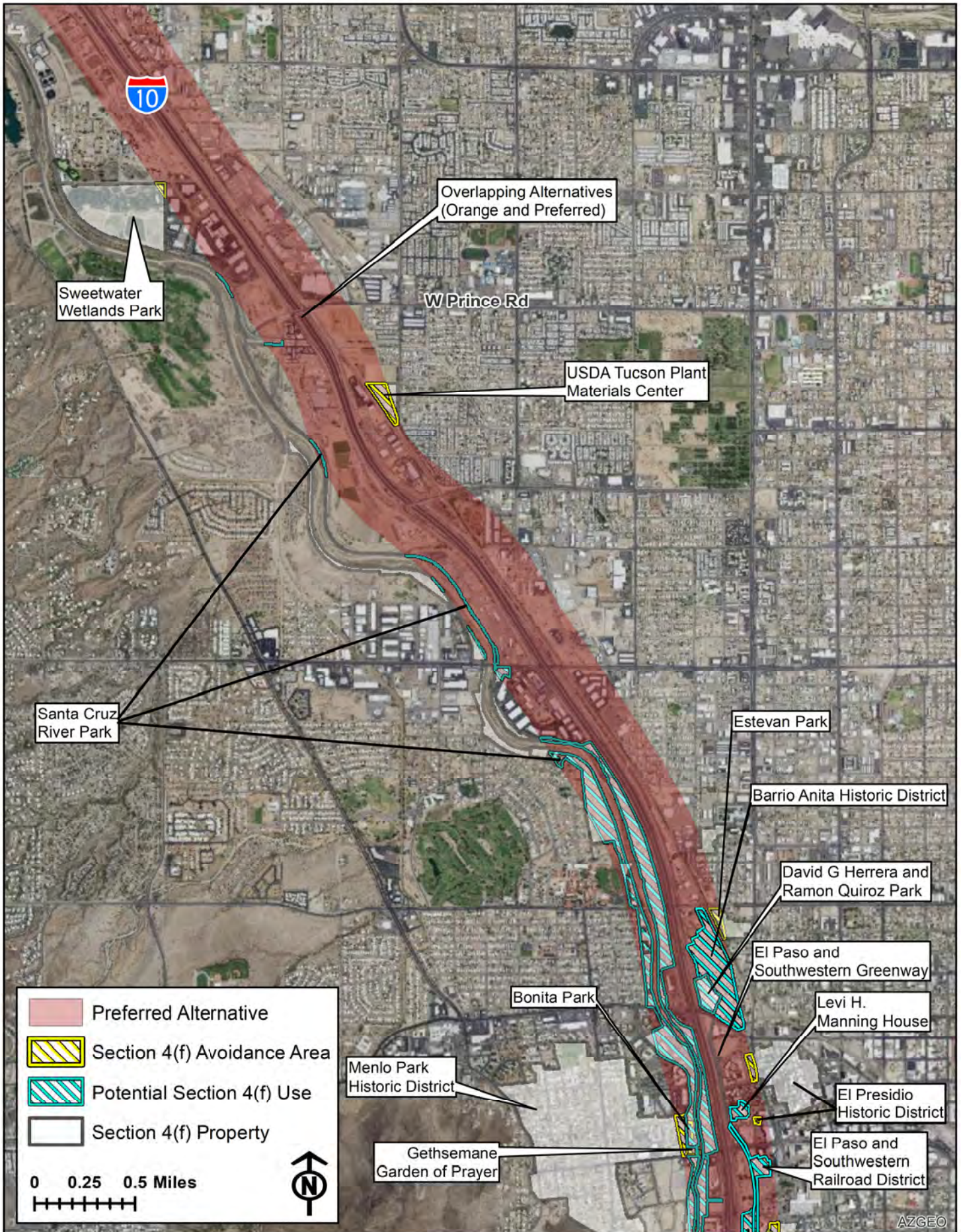


Figure 4-39. Downtown Tucson (North) Section 4(f) Properties - Preferred Alternative East Option and Orange Alternative

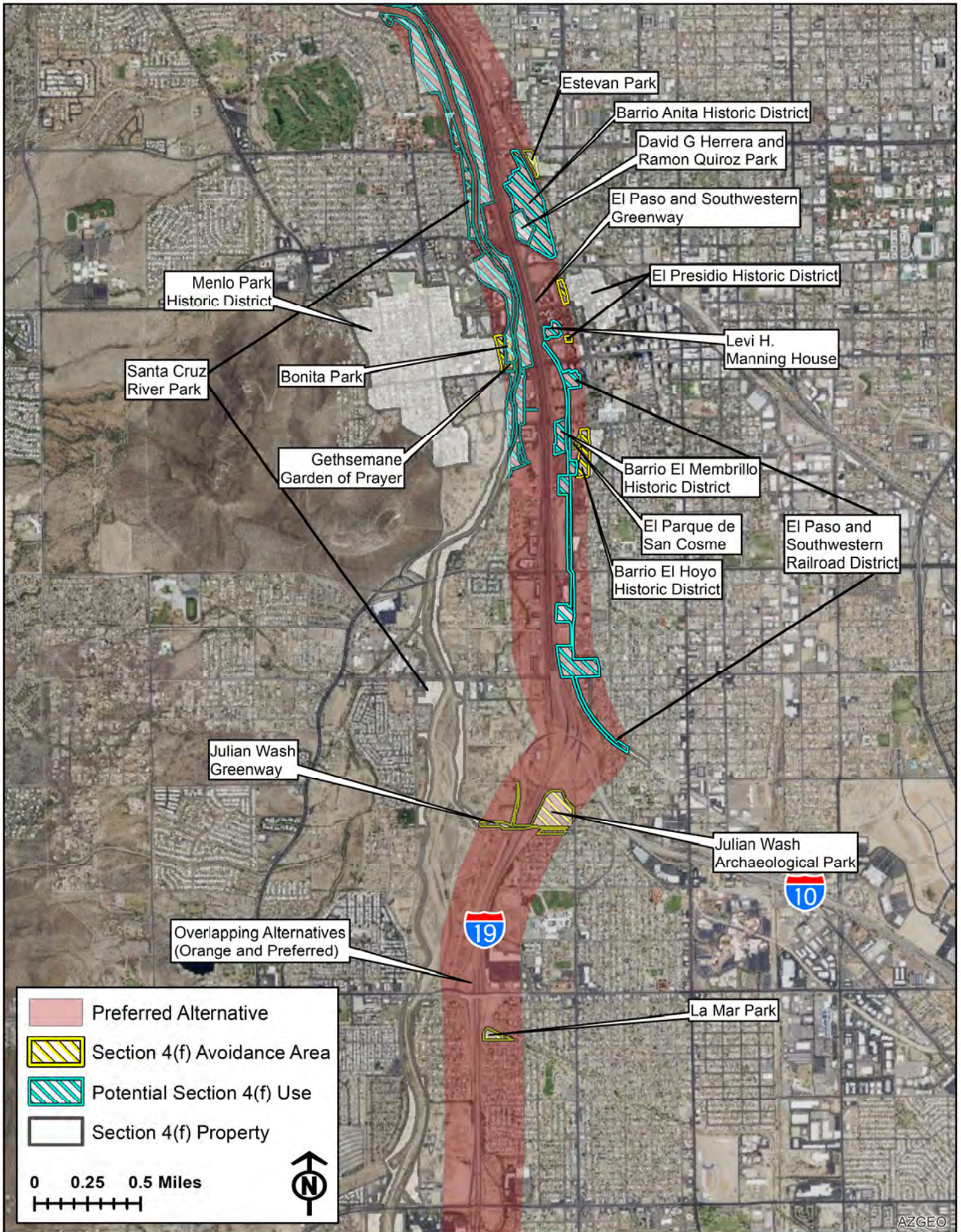


Figure 4-40. Downtown Tucson (South) Section 4(f) Properties - Preferred Alternative East Option and Orange Alternative



1 The Preferred Alternative east option or the Orange Alternative could potentially impact (use)
2 seven properties protected by Section 4(f) as shown on **Figure 4-39** and **Figure 4-40** and in
3 **Table 4-5**. The seven Section 4(f) properties at risk are:

- 4 • Santa Cruz River Park
- 5 • El Paso and Southwestern Greenway (planned trail)
- 6 • David G. Herrera and Ramon Quiroz Park (formerly Oury Park)
- 7 • Barrio El Membrillo Historic District
- 8 • El Paso and Southwestern Railroad District
- 9 • Levi H. Manning House
- 10 • Barrio Anita Historic District

11 **Table 3.7-10** in the Draft Tier 1 EIS describes impacts to historic properties by the Orange
12 Alternative. The Preferred Alternative east option or the Orange Alternative could require:

- 13 • Acquisition of parts of the Santa Cruz River Park
- 14 • Acquisition and demolition of the El Paso and Southwestern Greenway (planned trail)
- 15 • Acquisition of a portion of the David G. Herrera and Ramon Quiroz Park, a contributing
16 element to the Barrio Anita Historic District
- 17 • Removal of two to four contributing structures in the Barrio El Membrillo Historic District (of
18 approximately 10 surviving contributing residences) or possible removal of the contributing
19 resources of the district
- 20 • Acquisition of portions of the El Paso and Southwestern Railroad District; demolition of a
21 portion of the existing roundhouse
- 22 • Acquisition of a portion of Levi H. Manning House land
- 23 • Removal of at least one historic residential structure adjacent to I-10 in Barrio Anita

24 The Preferred Alternative east option or the Orange Alternative would have findings of adverse
25 effects under Section 106 of the NHPA and would permanently use Section 4(f) properties.
26 Additional impacts to non-recorded historic properties are described in **Section 3.7**
27 (Archaeological, Historical, Architectural, and Cultural Resources), including three residential
28 structures, the University of Arizona Agriculture Center, and Hotel Tucson.

29 **Avoidance Alternatives**

30 The property-specific avoidance analysis for the downtown Tucson properties assesses
31 whether, by using typical construction techniques and the findings of the Final Tier 1 EIS,
32 permanent incorporation of land from the downtown Tucson properties potentially can be

1 avoided by the No Build Alternative (2040), by improving the transportation facility without using
2 a Section 4(f) property or by building the transportation facility at a location that does not require
3 the use of the Section 4(f) property (FHWA 2005b). The results of the avoidance analysis for the
4 downtown Tucson properties are presented below.

5 No Build Alternative

6 The No Build Alternative (2040) is expected to avoid potential use of Section 4(f) properties.
7 However, the No Build Alternative (2040) is not a prudent avoidance alternative under Factor 1.
8 Specifically, and as described in **Chapter 6** (Preferred Alternative), the No Build Alternative
9 (2040) would compromise the project to such a degree that it would be unreasonable to proceed
10 in light of the I-11 Corridor Purpose and Need. The No Build Alternative (2040) would not
11 achieve the I-11 Corridor Purpose and Need, as it would not provide a high-priority, high-
12 capacity, access-controlled transportation corridor; would not support improved regional mobility
13 for people, goods, and homeland security; and would not enhance access to the high-capacity
14 transportation network to support economic vitality. Under the No Build Alternative (2040), travel
15 between Nogales and Wickenburg would occur on various existing corridors, such as I-19, I-10,
16 SR 101L, SR 202L, SR 303L, I-17, SR 74, and US 60.

17 Improve an Existing Transportation Facility Without Use of a Section 4(f) Property

18 The Build Corridor Alternatives are the outcome of an alternatives analysis that preliminarily
19 examined opportunities to avoid Section 4(f) and non-Section 4(f) properties (Draft Tier 1 EIS
20 **Chapter 2** [Alternatives Considered]). During the alternatives analysis, FHWA and ADOT
21 examined alignment shifts and design changes in downtown Tucson. An alignment shift moves
22 the roadway alignment to avoid the Section 4(f) property. In downtown Tucson, and as shown
23 on **Figure 4-39** and **Figure 4-40**, Section 4(f) properties are present on both the east and west
24 sides of the I-10 corridor, with some properties immediately adjacent to the I-10 right-of-way on
25 opposing sides of the roadway. Shifting the alignment of the I-11 Corridor to one side of I-10 or
26 the other would result in using Section 4(f) properties; avoiding Section 4(f) properties altogether
27 by shifting the alignment is not possible. As a result, alignment shifts do not result in an
28 avoidance alternative in downtown Tucson.

29 FHWA and ADOT also examined the potential to eliminate the frontage roads on each side of
30 I-10 to accommodate I-11 without impacting Section 4(f) properties. Eliminating frontage roads
31 has the potential to increase the area available for I-11 within existing transportation corridors
32 and may reduce or eliminate impacts to some Section 4(f) properties. Additional study of this
33 option is required in Tier 2 to assess the effects of eliminating frontage roads and the extent to
34 which Section 4(f) properties can be avoided.

35 FHWA and ADOT evaluated the feasibility of elevating I-11 in downtown Tucson to avoid
36 impacting Section 4(f) properties by using structures to elevate I-11 lanes above I-10.
37 Depending on the design, there may or may not be entry/exit points off I-11 to local streets. The
38 design and exact extent of impacts to Section 4(f) properties would be determined in Tier 2.
39 Although the elevated lanes could avoid use of adjacent Section 4(f) properties, noise and
40 visual impacts would result in adverse effects to historic buildings and structures. Deep
41 excavations for the elevated structure foundations would impact archaeological resources. For
42 these reasons, an elevated lanes alternative through downtown Tucson is not an avoidance
43 alternative. The elevated alternative also would impact businesses and residences that are not
44 protected by Section 4(f) and would add almost \$1 billion to the overall capital cost of the
45 Preferred Alternative east option or the Orange Alternative (compared to widening at grade).



1 FHWA and ADOT also analyzed the feasibility of tunneling I-11 from the I-19 interchange to
2 Prince Road (approximately 4 to 6 miles). The new I-11 lanes could be directly under I-10,
3 which would avoid potential visual and noise impacts. However, the tunnel could impact
4 undiscovered archaeological sites. The tunnel would require reconfiguring the I-19 interchange
5 to allow access into the tunnel. The estimated cost for the Preferred Alternative east option
6 assuming tunneling is approximately \$5.4 billion (compared to approximately \$586 million for
7 widening at grade). The Draft Tier 1 EIS states that tunneling is not prudent based on cost;
8 however, ADOT may re-evaluate this option in downtown Tucson in Tier 2.

9 In summary, the alternatives analysis in Tier 1 preliminarily assessed that the following options
10 would not avoid Section 4(f) properties in downtown Tucson: shifting the alignment, eliminating
11 frontage roads, elevating I-11, and tunneling I-11 under I-10 with I-10 remaining in place as it
12 exists today. During Tier 2 studies, each of these options will be evaluated in more detail as part
13 of the Preferred Alternative east option.

14 Build the Transportation Facility in a Location without Use of a Section 4(f) Property

15 All the Build Corridor Alternatives would impact Section 4(f) properties. The Preferred
16 Alternative west option would be located west of the Tucson area. The Preferred Alternative
17 west option would avoid the downtown Tucson properties but, as described in this Section 4(f)
18 Evaluation, would impact Section 4(f) properties on its route, including the Tucson Mitigation
19 Corridor. The Preferred Alternative west option is not an avoidance alternative.

20 Mitigation and Measures to Minimize Harm

21 If the Preferred Alternative east option is selected during Tier 2 studies, and prior to making a
22 Section 4(f) approval, project-level analysis in Tier 2 will include measures to minimize harm
23 and commitments that apply to Section 4(f) properties in general (listed in **Section 4.9**), as well
24 as specific commitments regarding properties in downtown Tucson, which are as follows:

- 25 • **T2-Section 4(f)-1:** If the Preferred Alternative east option is selected during Tier 2 studies,
26 ADOT will examine roadway design solutions to avoid or minimize impacts to Section 4(f)
27 properties in downtown Tucson. Examples of such solutions would include, but may not be
28 limited to, applying minimum required roadway cross sections, and shifting the proposed
29 roadway alignment to avoid some properties, elevating I-11 over I-10, tunneling I-11 under
30 I-10, and removing frontage roads. The benefits and impacts of design solutions will be
31 quantified, compared, and reported in Tier 2 analyses. Such reporting will also enable
32 comparison of the Preferred Alternative east option findings with those of the Preferred
33 Alternative west option in Tier 2.
- 34 • **T2-Section 4(f)-2:** If the Preferred Alternative east option is selected during Tier 2 studies,
35 ADOT will develop measures to minimize harm during Tier 2 in coordination with the officials
36 with jurisdiction over the affected properties in downtown Tucson.

37 The outcomes of Tier 2 studies and the Final Section 4(f) Evaluation will be ADOT's
38 commitments to include specific measures to minimize and mitigate harm to Section 4(f)
39 properties in downtown Tucson. These measures will be used to identify the alternative with the
40 least overall harm by comparing the alternatives and balancing achievement of the project
41 purpose and need with avoiding or minimizing impacts to Section 4(f) properties and non-
42 Section 4(f) resources.



1 **Coordination and Public Involvement**

2 FHWA and ADOT initiated coordination with SHPO about the downtown Tucson properties
3 during the EIS scoping process. SHPO concurred that the Orange Alternative would have
4 adverse effects to multiple historic and Section 4(f) properties (FHWA letter dated November 12,
5 2018, with concurrence from SHPO on November 23 and December 19, 2018) (**Appendix F3**
6 [Correspondence Related to Preliminary Section 4(f) Evaluation]).

7 FHWA and ADOT also coordinated with the City of Tucson and Pima County in regard to
8 identifying properties protected by Section 4(f), and potential design solutions to avoid Section
9 4(f) properties in downtown Tucson. In part because of coordination activities with the City of
10 Tucson and Pima County, FHWA and ADOT are advancing the Preferred Alternative east
11 option and the Preferred Alternative west option for Tier 2 studies, as well as the following
12 options in downtown Tucson: shifting the alignment, eliminating frontage roads, elevating I-11,
13 and tunneling I-11 under I-10.

14 FHWA and ADOT implemented a public involvement program during Tier 1 to share information
15 about the project with the public and seek public input. The Draft Tier 1 EIS was published on
16 April 5, 2019, followed by a public comment period that ended on July 8, 2019. During the public
17 comment period, FHWA and ADOT held six public hearings in the following locations: Buckeye
18 (April 29, 2019), Wickenburg (April 30, 2019), Casa Grande (May 1, 2019), Nogales (May 7,
19 2019), Tucson (May 8, 2019), and Marana (May 11, 2019). More detail regarding the public
20 involvement activities for the project may be found in **Chapter 5** (Coordination and Outreach) of
21 the Final Tier 1 EIS. Public comments on the Draft Tier 1 EIS may be found in **Appendix H**
22 (Comments on Draft Tier I EIS and Responses) of the Final Tier 1 EIS.

23 Throughout the Tier 1 EIS agency coordination and public involvement process, FHWA and
24 ADOT received input from members of the public in Pima County expressing opposition to the
25 I-11 Corridor. FHWA and ADOT invited the US Institute for Environmental Conflict Resolution to
26 facilitate a discussion in Pima County regarding the I-11 Tier 1 EIS. The US Institute is a
27 nationwide program of the Udall Foundation to assist parties in resolving environmental, public
28 lands, and natural resource conflicts that involve federal agencies or interests. The purpose of
29 the discussion was to gain a better understanding of the values and interests of the
30 communities in Pima County that the I-11 Corridor could impact. The stakeholders were divided
31 into two groups based on the communities they were representing: the I-10 Tucson
32 geographical area and the geographical area west and northwest of the Tucson Mountains. This
33 section summarizes the discussions with the I-10 Tucson geographical area group; **Section**
34 **4.6.3.3** describes discussions with the geographical area west and northwest of the Tucson
35 mountains group. During the discussions, stakeholders had the opportunity to identify
36 community-specific issues and concerns that could inform the decision-making process. The
37 U.S. Institute for Environmental Conflict Resolution prepared the final report documenting this
38 meeting process, which is included in **Appendix H** (Stakeholder Input) of the Draft Tier 1 EIS.

39 The I-10 Tucson geographical area group noted several adverse impacts the I-11 Corridor could
40 have on their community, including:

- 41 • Demolishing culturally significant historic resources and buildings
- 42 • Causing greater separation of the unique culture and history of the neighborhood



- 1 • Altering the sense of place in downtown Tucson
- 2 • Creating economic hardships for nearby businesses

3 During Tier 2 studies, FHWA will further evaluate the potential for use of Section 4(f) properties
4 in downtown Tucson and in the Avra Valley region west of Tucson, coordinate with officials with
5 jurisdiction, and prepare a Tier 2 Section 4(f) Evaluation of the Preferred Alternative west option,
6 Preferred Alternative east option, and other alternatives that may be considered at that time.

7 **4.6.3.3 Tucson Mitigation Corridor – Potential Individual Use (Preferred Alternative**
8 **West Option, Recommended, Purple, and Green Alternatives); No Use**
9 **(Preferred Alternative East Option and Orange Alternative)**

10 **Identification of the Section 4(f) Property**

11 The Tucson Mitigation Corridor (**Figure 4-41**) is a 2,514-acre property owned and managed by
12 the DOI, Bureau of Reclamation. The Tucson Mitigation Corridor was established in 1990 as a
13 commitment made by the Bureau of Reclamation with USFWS, AGFD, and Pima County to
14 partially mitigate biological impacts from the CAP. The four parties signed a 2002 cooperative
15 agreement to manage the Tucson Mitigation Corridor property in accordance with a Master
16 Management Plan that prohibits future development other than existing wildlife habitat
17 improvements (Pima County Resolution No. 1989-24B). The 2002 Cooperative Agreement
18 states in part, “Whereas, lands described herein for fish and wildlife purposes shall not become
19 subject to exchange or other transaction if those actions would defeat the initial purpose of their
20 acquisition (16 United States Code, Section 663(d)).” This agreement is intended to preserve
21 habitat from urbanization while maintaining wildlife movement across the CAP in Avra Valley.
22 Accordingly, the Bureau of Reclamation identified the Tucson Mitigation Corridor as a property
23 protected by Section 4(f) in its July 8, 2016, letter to ADOT during scoping (**Appendix F3**
24 [Correspondence Related to Preliminary Section 4(f) Evaluation]).

25 The CAP canal is a water conveyance canal that crosses the Tucson Mitigation Corridor from
26 north to south. The CAP canal underwent its own NEPA process that included involvement from
27 the public, environmental organizations, and government agencies. During that NEPA process,
28 the importance of providing wildlife connectivity across the Tucson Mitigation Corridor was
29 echoed by the public. To maintain a functional wildlife movement corridor across the CAP canal
30 on the Tucson Mitigation Corridor property, the Bureau of Reclamation installed seven concrete
31 pipe sections (also known as siphons) under washes, keeping the ground surface intact for
32 wildlife to use. Providing the siphons was critical to obtaining public acceptance of the CAP
33 alignment. Since installation, the Bureau of Reclamation and its partners have observed wildlife
34 using the siphon crossings to migrate across the Tucson Mitigation Corridor between Ironwood
35 Forest National Monument, Tohono O’odham Nation, and Roskrige Mountains to the west and
36 Saguaro National Park, Tucson Mountain Park, and Tucson Mountains to the east.

37

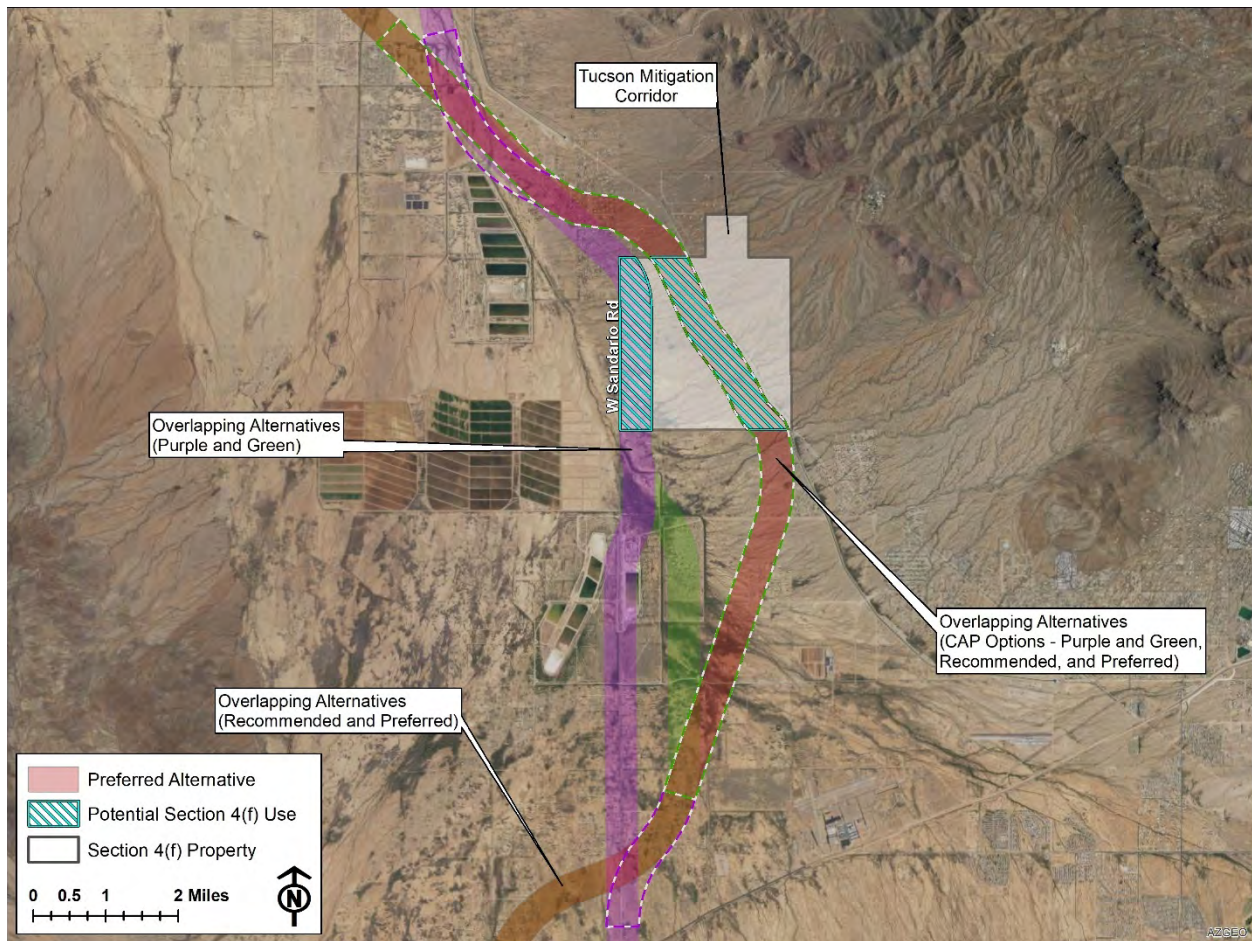


Figure 4-41. Tucson Mitigation Corridor – Preferred Alternative West Option, Recommended, Purple, or Green (CAP Design Option) Alternative

Proposed Use of the Section 4(f) Property

In this revised Draft Preliminary Section 4(f) Evaluation, the Preferred Alternative west option (Options C and D), and Recommended, Purple, and Green Alternatives would incorporate a portion of Tucson Mitigation Corridor land (453 acres, or approximately 18 percent), thereby using the Tucson Mitigation Corridor property. The 2,000-foot-wide corridor of each Build Corridor Alternative would be co-located with the CAP. As a result, the I-11 Corridor would potentially use the Tucson Mitigation Corridor property adjacent to the west side of the CAP (**Section 4.5.1**). The Preferred Alternative east option would not incorporate land from the Tucson Mitigation Corridor; no potential use of the Tucson Mitigation Corridor would occur under Section 4(f) for the Preferred Alternative east option.

Avoidance Alternatives

The property-specific avoidance analysis for the Tucson Mitigation Corridor applied the feasible and prudent criteria specified by 23 CFR 774.17 and listed in **Section 4.4.4.1**.

The property-specific avoidance analysis for the Tucson Mitigation Corridor assesses whether, by using typical construction techniques and the findings of the Final Tier 1 EIS, permanent

1 incorporation of land from the Tucson Mitigation Corridor property potentially can be avoided by
2 the No Build Alternative (2040), by improving the transportation facility without using a Section
3 4(f) property or by building the transportation facility at a location that does not require the use
4 of the Section 4(f) property (FHWA 2005b). The results of the avoidance analysis for the Tucson
5 Mitigation Corridor property are presented below.

6 No Build Alternative

7 The No Build Alternative (2040) is expected to avoid potential use of Section 4(f) properties.
8 However, the No Build Alternative (2040) is not a prudent avoidance alternative under Factor 1.
9 Specifically, and as described in **Chapter 6** (Preferred Alternative), the No Build Alternative
10 (2040) would compromise the project to such a degree that it would be unreasonable to proceed
11 in light of the I-11 Corridor Purpose and Need. The No Build Alternative (2040) would not
12 achieve the I-11 Corridor Purpose and Need, as it would not provide a high-priority, high-
13 capacity, access-controlled transportation corridor; would not support improved regional mobility
14 for people, goods, and homeland security; and would not enhance access to the high-capacity
15 transportation network to support economic vitality. Under the No Build Alternative (2040), travel
16 between Nogales and Wickenburg would occur on various existing corridors, such as I-19, I-10,
17 SR 101L, SR 202L, SR 303L, I-17, SR 74, and US 60.

18 Improve an Existing Transportation Facility Without Use of a Section 4(f) Property

19 The Preferred Alternative east option or Orange Alternative would be co-located with I-10 in the
20 Tucson area. The Preferred Alternative east option or Orange Alternative would avoid the
21 Tucson Mitigation Corridor but would impact Section 4(f) properties. The Preferred Alternative
22 east option and Orange Alternative are not avoidance alternatives.

23 The Build Corridor Alternatives are the outcome of an alternatives analysis that examined
24 opportunities to avoid Section 4(f) and non-Section 4(f) properties (Draft Tier 1 EIS **Chapter 2**
25 [Alternatives Considered]). During the alternatives analysis, FHWA and ADOT examined an
26 alignment west of the Tucson Mitigation Corridor property within the Sandario Road right-of-
27 way. Sandario Road runs parallel to the western boundary of the Tucson Mitigation Corridor.
28 The right-of-way is 80 feet wide and contains Sandario Road, a two-lane, two-way road. An 80-
29 foot-wide right-of-way is not wide enough to accommodate the proposed 400-foot right-of-way
30 for I-11 by itself or with existing Sandario Road. Additional right-of-way would be needed to
31 accommodate I-11 and retain the local traffic movements provided by Sandario Road.

32 FHWA and ADOT considered whether I-11 and Sandario Road could be accommodated in the
33 right-of-way by creating a three-level structure in the right-of-way with Sandario Road at grade,
34 with one direction of I-11 on a second level and the other direction of I-11 on a third level. While
35 the width of the right-of-way potentially could accommodate such an arrangement, the design of
36 a multi-level structure with a distance of approximately 2 miles (the length of the Tucson
37 Mitigation Corridor's western boundary) would require extensive entrance and exit structures
38 and provisions for emergency access in at least one location within that 2-mile stretch. The
39 multi-level highway structure and entrance and exit structures would extend impacts onto the
40 Tucson Mitigation Corridor property. Wildlife connectivity across Sandario Road would be
41 disrupted by the structures. The structures would also be substantially more visually invasive
42 than an at-grade highway. Also, the multi-level structure would not be desirable with respect to
43 maintenance and operations (Factors 2 and 4). Thus, while a multi-level structure may be
44 feasible, it is not prudent.



1 Build the Transportation Facility in a Location without Use of a Section 4(f) Property

2 All the Build Corridor Alternatives would impact Section 4(f) properties. The Preferred
3 Alternative east option and Orange Alternative would avoid the Tucson Mitigation Corridor
4 Section 4(f) property but would impact Section 4(f) properties that are clustered in downtown
5 Tucson. FHWA and ADOT considered the following designs to avoid Section 4(f) properties:

- 6 • **Corridor east of the Tucson Mitigation Corridor.** The Tucson Mitigation Corridor is
7 bordered on the east by the Tucson Mountain Park and to the north by Saguaro National
8 Park (both Section 4(f) properties). Therefore, an alignment to the east of the Tucson
9 Mitigation Corridor is not an avoidance alternative.
- 10 • **Corridor west of Sandario Road.** The Tohono O’odham Nation owns the land west of
11 Sandario Road. Early coordination with the Tohono O’odham Nation determined that the
12 tribe did not want the project on their sovereign lands. **Appendix F3** (Correspondence
13 Related to Preliminary Section 4(f) Evaluation) provides the 2017 resolution passed by the
14 Schuk Toak District of the Tohono O’odham Nation, which states that the Garcia Strip
15 Community in the Schuk Toak District of the Tohono O’odham Nation opposes a project
16 alignment on or near their community on the eastern boundary of the Tohono O’odham
17 Nation property west of Sandario Road. Therefore, a corridor west of Sandario Road is not
18 feasible.
- 19 • **Elevated Structure.** Placing I-11 on an elevated structure over the Tucson Mitigation
20 Corridor would allow space for wildlife movements across and underneath the roadway
21 facility. Supporting columns would be required at intervals across the property to support the
22 elevated structure. For this reason, the elevated structure option is not an avoidance
23 alternative.
- 24 • **Tunneling.** Placing I-11 in a tunnel under the Tucson Mitigation Corridor or under Sandario
25 Road would reduce the amount of land incorporated from the Tucson Mitigation Corridor
26 property. Tunneling activities could impact historic and archaeological sites on the Tucson
27 Mitigation Corridor property because a tunnel would require construction of portal structures
28 for the roadway transitions from above ground to below ground. Additionally, emergency
29 access and ventilation structures connecting the tunnel to the ground surface would be
30 required. A tunnel of this magnitude would add more than \$1 billion in costs to the Preferred
31 Alternative west option. The Draft Tier 1 EIS states that tunneling is not prudent based on
32 cost; however, ADOT may re-evaluate this option for the Tucson Mitigation Corridor in
33 Tier 2.

34 Mitigation and Measures to Minimize Harm

35 FHWA and ADOT coordinated with the Bureau of Reclamation in regard to the Tucson
36 Mitigation Corridor property. The Bureau of Reclamation is the official with jurisdiction over the
37 Tucson Mitigation Corridor property because, using the definition provided in 23 CFR 774.17,
38 the Bureau of Reclamation is the agency that owns and administers the Tucson Mitigation
39 Corridor property. The Bureau of Reclamation is the sole agency that is empowered to
40 represent the Bureau of Reclamation on matters related to the Tucson Mitigation Corridor
41 property.

42 Early coordination among FHWA, ADOT, and the Bureau of Reclamation and input received
43 from the public identified an opportunity to refine the alignment of the Purple and Green



1 Alternatives to minimize potential impacts on the Tucson Mitigation Corridor property. Because
2 the purpose of the Tucson Mitigation Corridor is to enable wildlife movements across the
3 property, FHWA and ADOT coordinated with the Bureau of Reclamation on developing a
4 conceptual roadway right-of-way width and alignment designs that would minimize impacts to
5 wildlife movements. Concepts considered included use of the existing Sandario Road right-of-
6 way with additional right-of-way from the Tucson Mitigation Corridor property (as originally
7 designed) or alignment of I-11 alongside the existing CAP canal that crosses the Tucson
8 Mitigation Corridor in a southeast to northwest direction. A summary of FHWA, the Bureau of
9 Reclamation, and ADOT coordination in regard to these concepts is described as follows:

- 10 • **Alignment Co-located with Existing Sandario Road.** Co-locating I-11 with Sandario Road
11 and using the Sandario Road right-of-way for a portion of the I-11 right-of-way needs would
12 reduce the amount of Tucson Mitigation Corridor land that would be needed for I-11
13 compared with a stand-alone alignment across the property. However, the Bureau of
14 Reclamation is concerned not only with the property impacts at that location but also with
15 the potential negative effects of I-11, Sandario Road, and the CAP canal on wildlife
16 movements. Specifically, each existing linear facility (Sandario Road and the CAP canal)
17 has some barrier effect on wildlife movements across the property. Placing I-11 on Sandario
18 Road would add at-grade interstate highway infrastructure (additional travel lanes and
19 barrier dividers), thereby increasing the barrier effect at the Sandario Road location. The
20 Bureau of Reclamation indicated that I-11/Sandario Road and the CAP canal would form
21 two parallel linear systems that would negatively affect wildlife movements to a greater
22 extent than exists today.

- 23 • **Alignment on the West Side of the CAP Canal, Existing Sandario Road.** Because of the
24 Bureau of Reclamation's concerns about co-locating I-11 with Sandario Road, FHWA,
25 ADOT, and the Bureau of Reclamation worked together to develop a concept that would
26 place I-11 on the west side of and parallel to the CAP canal. An alignment on the east side
27 of the CAP canal is infeasible because of the sloping condition of the land and because it
28 would require two, likely elevated interstate crossings of the CAP; such crossings would
29 cause visual and noise effects. The west side alignment would consolidate the two linear
30 systems in one general location. The concept for I-11 would include wildlife crossing areas
31 that are in line with the existing CAP siphon crossings. The Bureau of Reclamation prefers
32 this alignment of I-11 alongside the CAP canal because, although land from the Tucson
33 Mitigation Corridor would be required for I-11, the alignment would consolidate the I-11 and
34 CAP infrastructure in one general location. However, the Bureau of Reclamation was
35 concerned about the negative effects on wildlife movements that would be caused by
36 retaining existing Sandario Road in its current location and the I-11/CAP corridors.

- 37 • **CAP Design Option (Alignment on the West Side of the CAP Canal, with Mitigation).**
38 Based on these concerns, FHWA, ADOT, and the Bureau of Reclamation worked together
39 to develop the following mitigation concepts to relocate Sandario Road and reduce the
40 barrier effect of the I-11/CAP canal corridors:
 - 41 ○ Remove and reclaim Sandario Road. As identified in the Bureau of Reclamation's June
42 8, 2018, letter (**Appendix F3** [Correspondence Related to Preliminary Section 4(f)
43 Evaluation]), ADOT would terminate Sandario Road at the northern and southern border
44 of the Tucson Mitigation Corridor (approximately a 2-mile section of road) using cul-de-
45 sacs. ADOT would remove the abandoned section of the road and any fencing or other
46 features that are a wildlife barrier and reclaim the right-of-way with native habitat. The



1 design would remove barriers for wildlife while ensuring local access to adjacent
2 properties is maintained.

3 ○ Sandario Road is managed by Pima County. The ownership of the road is half Pima
4 County and half Tohono O’odham Nation. Pima County has a maintenance easement on
5 the tribal land. Relocating Sandario Road would be undertaken as an integral part of the
6 proposed project if the Preferred Alternative west option were to be selected in Tier 2
7 studies. During Tier 2 study, ADOT would undertake coordination with the Bureau of
8 Reclamation, the Tohono O’odham Nation, Pima County, the public, and others as part
9 of identifying a specific design and construction plan for relocating Sandario Road,
10 assessing potential benefits and impacts, and developing appropriate mitigation.

11 ○ I-11 Wildlife Crossings. ADOT would incorporate seven wildlife crossing areas into the
12 I-11 and Sandario Road design such that the crossings are in line with the existing CAP
13 canal siphons. By removing Sandario Road, co-aligning I-11 alongside the CAP canal,
14 and co-aligning wildlife crossing areas, the barrier effect formed by existing Sandario
15 Road would be removed. The Bureau of Reclamation acknowledges this mitigation
16 measure for this reason and because it would consolidate the I-11/CAP canal
17 infrastructure in one location and reduce the potential barrier effect I-11 could cause on
18 the Tucson Mitigation Corridor property. As stated in their letter of June 8, 2018
19 (**Appendix F3** [Correspondence Related to Preliminary Section 4(f) Evaluation]), this
20 would encourage and enhance conditions for wildlife movements across the Tucson
21 Mitigation Corridor compared to the alternative of I-11 not adjacent to the CAP canal.

22 Wildlife crossings could take the form of passages over or under I-11 depending on a
23 variety of factors such as, but not limited to, engineering feasibility, terrain, and wildlife
24 requirements. The analysis of, and specifications for, such crossings would be
25 determined during Tier 2 studies in coordination with the official with jurisdiction.

26 Minimization and Mitigation Measures

27 Prior to making a Section 4(f) approval, project-level analysis in Tier 2 will include measures to
28 minimize harm and commitments that apply to Section 4(f) properties in general (listed in
29 **Section 4.9**). ADOT will consult with the Bureau of Reclamation, AGFD, USFWS, and Pima
30 County to evaluate the Preferred Alternative west option in more detail in Tier 2. After these
31 consultations, if the Preferred Alternative west option is chosen, ADOT will continue
32 consultations to further develop measures to minimize and mitigate impacts to the Tucson
33 Mitigation Corridor. As a result of extensive coordination with cooperating agencies, FHWA and
34 ADOT assumed the CAP Design Option (as described above) for assessing impacts in the Draft
35 Tier 1 EIS. The Tier 2 studies may evaluate tunneling or elevated structures to minimize or
36 mitigate impacts to the Tucson Mitigation Corridor, including the need to relocate Sandario
37 Road.

38 Specific commitments regarding the Tucson Mitigation Corridor are:

- 39 • **T2-Section 4(f)-3:** Coordinate with Central Arizona Water Conservation District and the
40 Bureau of Reclamation on the applicable design standards in Tier 2 studies.
- 41 • **MM-Section 4(f)-1:** Coordinate with the Bureau of Reclamation, NPS, AGFD, and Pima
42 County regarding the Tucson Mitigation Corridor during Tier 2 studies.



- 1 • **MM-Section 4(f)-2:** Relocate and reclaim Sandario Road. If the Preferred Alternative west
2 option (including the CAP Design Option) is chosen in Tier 2, ADOT will further study
3 relocation of Sandario Road to coincide with the new I-11 alignment. ADOT will remove and
4 reclaim an approximately 2-mile section of the existing road with native vegetation. The
5 design would reduce barriers for wildlife (including the road and associated roadway
6 fencing) while maintaining necessary local access.
- 7 • **MM-Section 4(f)-3:** Co-align wildlife crossings with CAP canal wildlife crossings. If the
8 Preferred Alternative west option is chosen in Tier 2, ADOT will study placement of wildlife
9 crossings on I-11 that align with the six existing CAP siphon crossings in the Tucson
10 Mitigation Corridor and would place one wildlife crossing immediately north of the Tucson
11 Mitigation Corridor (a total of seven crossings). The purpose of the I-11 wildlife crossings is
12 to provide continuity to the existing CAP wildlife crossings (siphons) and minimize impacts to
13 wildlife movements between the Tucson Mountains and Roskrige Mountains.
- 14 • **MM-Section 4(f)-4:** Provide no interchanges between West Snyder Hill Road and West
15 Manville Road. To maximize the effectiveness of the Tucson Mitigation Corridor mitigation
16 measures, ADOT will not build exits or interchanges on I-11 between West Snyder Hill Road
17 and West Manville Road if the Preferred Alternative west option is chosen in Tier 2. The
18 distance between these two roads is approximately 9 miles.
- 19 • **MM-Section 4(f)-5:** Minimize width of I-11 in Tucson Mitigation Corridor. If the Preferred
20 Alternative west option is chosen in Tier 2, ADOT will minimize the width of I-11 through the
21 Tucson Mitigation Corridor using appropriate interstate design standards.
- 22 • **MM-Section 4(f)-6:** Partner with land use planning organizations and agencies.
23 Understanding the potential for indirect and cumulative land use effects that could occur if
24 the Preferred Alternative west option is chosen in Tier 2, ADOT will be an active partner in a
25 broader effort with metropolitan planning organizations, local jurisdictions, resource
26 agencies, and private stakeholders to cooperatively plan development in the I-11 Corridor.
27 The effort would coordinate wildlife connectivity, local land use planning, and context-
28 sensitive design for the I-11 facility. The White Tank Mountains Conservancy may be a
29 model for this type of effort. Coordination with Pima County on the implementation of the
30 Sonoran Desert Conservation Plan also could be part of the effort.
- 31 • **MM-Section 4(f)-7:** Apply design standards. The Bureau of Reclamation and the Central
32 Arizona Water Conservation District have design standards for facilities that encroach on
33 CAP lands. ADOT will comply with these standards where I-11 crosses CAP lands or is
34 adjacent to the CAP facility.
- 35 • **MM-Section 4(f)-8:** Comply with dark skies objectives. Roadway lighting will be compatible
36 with dark skies objectives and lighting would be limited to be consistent with land use and
37 development patterns at the time of the I-11 Corridor implementation.
- 38 • **MM-Section 4(f)-9:** Visually screen the Project. If the Preferred Alternative west option is
39 chosen in Tier 2, the roadway will be designed in such a way as to screen the facility from
40 sensitive viewpoints in the area. The design will use various measures, such as vegetation,
41 berms, and topography or partial depression of the roadway, to accomplish this. The
42 screening also could reduce noise impacts.



- 1 • **MM-Section 4(f)-10:** Undertake wildlife studies and create or enhance wildlife corridor(s).
2 ADOT will coordinate with AGFD and USFWS, as recognized wildlife authorities, on
3 determining the studies required to understand east-west wildlife movement needs (both on
4 and off the Tucson Mitigation Corridor) between the Tucson Mountains and the Roskrige
5 Mountains. ADOT will undertake and use the results of the wildlife studies, in consultation
6 with AGFD, USFWS, and the Tucson Mitigation Corridor Working Group, to develop specific
7 mitigation measures that will be incorporated into the I-11 Corridor. Mitigation measures may
8 include creation of new or enhancement of existing wildlife corridor(s) on or outside the
9 Tucson Mitigation Corridor property, but would be located between the Tucson Mountains to
10 the east and the Roskrige Mountains to the west, and they would support the purpose of
11 the Tucson Mitigation Corridor. These studies will gather baseline wildlife data, including
12 evaluation of historical and current movement data, and surveys of existing populations.
13 Using the baseline data, the studies will identify the extent, location, requirements, target
14 species, and expected benefits of additional and enhanced wildlife movement corridors,
15 supporting structures, and other mitigation measures. The wildlife studies will identify
16 adaptive management thresholds and likely actions. ADOT will fund and facilitate the
17 implementation of the identified wildlife studies in Tier 2 so that the results can be used to
18 inform the I-11 Corridor design.
- 19 • **MM-Section 4(f)-11:** Replace or compensate for any land in the Tucson Mitigation Corridor
20 acquired for I-11 by considering comparable value and function, restoration of land value,
21 and preservation of land. If the Preferred Alternative west option requires acquisition of
22 Tucson Mitigation Corridor land, ADOT will assess the feasibility of transferring land
23 acquired for Tucson Mitigation Corridor mitigation to an entity that would protect the lands
24 for wildlife and wildlife movement purposes. ADOT will consult with the Tucson Mitigation
25 Corridor partners to jointly identify and agree on the appropriate entity.

26 **Coordination and Public Involvement**

27 FHWA and ADOT coordinated with the Bureau of Reclamation and Tucson Mitigation Corridor
28 management partners in each phase of alternatives development and evaluation, beginning with
29 scoping and continuing through development and evaluation of the Build Corridor Alternatives.
30 Specifically, and as described in this section, the Bureau of Reclamation stated their opinion
31 that the Tucson Mitigation Corridor is protected by Section 4(f) in their July 8, 2016 letter
32 (**Appendix F3** [Correspondence Related to Preliminary Section 4(f) Evaluation]). Subsequent
33 coordination meetings among FHWA, ADOT, and the Bureau of Reclamation in 2017 and 2018
34 included discussion of the merits and flaws associated with aligning the Build Corridor
35 Alternatives on Sandario Road or alongside the CAP canal and relocating Sandario Road and
36 co-aligning the I-11/CAP canal wildlife crossings. Coordination activities also included
37 consideration of applying the Programmatic Net Benefit approach for the Tucson Mitigation
38 Corridor, an approach that will not be pursued. **Section 4.10.2** provides more detail regarding
39 the Programmatic Net Benefit approach. In all such discussions, minimizing impacts to wildlife
40 movements was the primary concern of all parties.

41 This detailed coordination work was critical to identifying and resolving concerns regarding the
42 ability of the Tucson Mitigation Corridor property to continue achieving its mission of enabling
43 wildlife movements. The March 5, 2018 meeting memoranda found in **Appendix F3**
44 (Correspondence Related to Preliminary Section 4(f) Evaluation) of the Final Tier 1 EIS
45 documents these coordination activities.



1 FHWA and ADOT implemented a public involvement program during Tier 1 to share information
2 about the project with the public and seek public input. The Draft Tier 1 EIS was published on
3 April 5, 2019, followed by a public comment period that ended on July 8, 2019. During the public
4 comment period, FHWA and ADOT held six public hearings in the following locations: Buckeye
5 (April 29, 2019), Wickenburg (April 30, 2019), Casa Grande (May 1, 2019), Nogales (May 7,
6 2019), Tucson (May 8, 2019), and Marana (May 11, 2019). More detail regarding the public
7 involvement activities for the project may be found in **Chapter 5** (Coordination and Outreach) of
8 the Final Tier 1 EIS. Public comments on the Draft Tier 1 EIS may be found in **Appendix H**
9 (Comments on Draft Tier I EIS and Responses) of the Final Tier 1 EIS.

10 Throughout the Tier 1 EIS agency coordination and public involvement process, FHWA and
11 ADOT received input from members of the public expressing opposition to the I-11 Corridor.
12 FHWA and ADOT invited the US Institute for Environmental Conflict Resolution to facilitate a
13 discussion in Pima County regarding the I-11 Corridor Tier 1 EIS. The US Institute is a
14 nationwide program of the Udall Foundation to assist parties in resolving environmental, public
15 lands, and natural resource conflicts that involve federal agencies or interests. The purpose of
16 the discussion was to gain a better understanding of the values and interests of the
17 communities in Pima County that the I-11 Corridor could impact: the I-10 Tucson geographical
18 area and the geographical area west and northwest of the Tucson Mountains. This section
19 summarizes the discussions with the geographical area west and northwest of the Tucson
20 mountains group. **Section 4.6.3.2** describes discussions with the I-10 Tucson geographical area
21 group. During the meetings, the following community-specific issues and concerns were
22 identified that could inform the decision-making process. The US Institute for Environmental
23 Conflict Resolution prepared the final report documenting this meeting process, which is
24 included in **Appendix H** (Stakeholder Input) of the Draft Tier 1 EIS.

25 The geographical area west and northwest of the Tucson mountains group noted their primary
26 preference to not build I-11 in their area and stated the following concerns regarding the
27 adverse impacts the I-11 Corridor could have on their community, including but not limited to:

- 28 • Impacted viewsheds
- 29 • Impacted Saguaro National Park, protected lands, and desert ecosystem
- 30 • Loss of community cohesion; impacts to quality of life
- 31 • Fragmentation of wildlife connectivity
- 32 • Potential contamination of the City of Tucson's aquifer, SAVSARP and CAVSARP recharge
33 basins, and wells
- 34 • Impacted emergency services and public safety
- 35 • Impacts from light, noise, and air quality

36 Stakeholders from the geographical area west and northwest of the Tucson mountains group
37 meetings proposed different strategies to mitigate these concerns, including co-locating with the
38 CAP canal, tunneling under the Tucson Mitigation Corridor, and other robust construction
39 techniques to isolate I-11 from the surrounding area.



1 **4.6.4 Constructive Use**

2 **4.6.4.1 Regulatory Context**

3 The requirements of 23 CFR 774.15 describe the conditions in which a constructive use could
4 occur:

5 “A constructive use occurs when the transportation project does not incorporate land
6 from a Section 4(f) property, but the project's proximity impacts are so severe that the
7 protected activities, features, or attributes that qualify the property for protection under
8 Section 4(f) are substantially impaired. Substantial impairment occurs only when the
9 protected activities, features, or attributes of the property are substantially diminished.”

10 Substantial impairment is a high threshold; an impact does not rise to the level of being
11 so severe unless specific criteria are achieved. FHWA has determined that a
12 constructive use occurs when (23 CFR 774.15(e)):

13 “(1) The projected noise level increase attributable to the project substantially interferes
14 with the use and enjoyment of a noise-sensitive facility of a property protected by
15 Section 4(f), such as:

16 (i) Hearing the performances at an outdoor amphitheater;

17 (ii) Sleeping in the sleeping area of a campground;

18 (iii) Enjoyment of a historic site where a quiet setting is a generally recognized feature or
19 attribute of the site's significance;

20 (iv) Enjoyment of an urban park where serenity and quiet are significant attributes; or

21 (v) Viewing wildlife in an area of a wildlife and waterfowl refuge intended for such
22 viewing.

23 (2) The proximity of the proposed project substantially impairs esthetic features or
24 attributes of a property protected by Section 4(f), where such features or attributes are
25 considered important contributing elements to the value of the property. Examples of
26 substantial impairment to visual or esthetic qualities would be the location of a proposed
27 transportation facility in such proximity that the facility obstructs or eliminates the primary
28 views of an architecturally significant historical building, or substantially detracts from the
29 setting of a Section 4(f) property which derives its value in substantial part due to its
30 setting;

31 (3) The project results in a restriction of access which substantially diminishes the utility
32 of a significant publicly owned park, recreation area, or a historic site;

33 (4) The vibration impact from construction or operation of the project substantially
34 impairs the use of a Section 4(f) property, such as projected vibration levels that are
35 great enough to physically damage a historic building or substantially diminish the utility
36 of the building, unless the damage is repaired and fully restored consistent with the
37 Secretary of the Interior's Standards for the Treatment of Historic Properties, i.e., the



1 integrity of the contributing features must be returned to a condition which is
2 substantially similar to that which existed prior to the project; or

3 (5) The ecological intrusion of the project substantially diminishes the value of wildlife
4 habitat in a wildlife and waterfowl refuge adjacent to the project, substantially interferes
5 with the access to a wildlife and waterfowl refuge when such access is necessary for
6 established wildlife migration or critical life cycle processes, or substantially reduces the
7 wildlife use of a wildlife and waterfowl refuge.”

8 FHWA has determined that a constructive use does not occur when (23 CFR 774.15(f)):

9 “(1) Compliance with the requirements of 36 CFR 800.5 for proximity impacts of the
10 proposed action, on a site listed on or eligible for the National Register, results in an
11 agreement of ‘no historic properties affected’ or ‘no adverse effect’;

12 (2) The impacts of projected traffic noise levels of the proposed highway project on a
13 noise-sensitive activity do not exceed the FHWA noise abatement criteria as contained
14 in Table 1 in part 772 of this chapter, or the projected operational noise levels of the
15 proposed transit project do not exceed the noise impact criteria for a Section 4(f) activity
16 in the FTA [Federal Transportation Administration] guidelines for transit noise and
17 vibration impact assessment;

18 (3) The projected noise levels exceed the relevant threshold in paragraph (f)(2) of this
19 section because of high existing noise, but the increase in the projected noise levels if
20 the proposed project is constructed, when compared with the projected noise levels if
21 the project is not built, is barely perceptible (3 dBA or less);

22 (4) There are proximity impacts to a Section 4(f) property, but a governmental agency's
23 right-of-way acquisition or adoption of project location, or the Administration's approval of
24 a final environmental document, established the location for the proposed transportation
25 project before the designation, establishment, or change in the significance of the
26 property. However, if it is reasonably foreseeable that a property would qualify as eligible
27 for the National Register prior to the start of construction, then the property should be
28 treated as a historic site for the purposes of this section; or

29 (5) Overall (combined) proximity impacts caused by a proposed project do not
30 substantially impair the activities, features, or attributes that qualify a property for
31 protection under Section 4(f);

32 (6) Proximity impacts will be mitigated to a condition equivalent to, or better than, that
33 which would occur if the project were not built, as determined after consultation with the
34 official(s) with jurisdiction;

35 (7) Change in accessibility will not substantially diminish the utilization of the Section 4(f)
36 property; or

37 (8) Vibration levels from project construction activities are mitigated, through advance
38 planning and monitoring of the activities, to levels that do not cause a substantial
39 impairment of protected activities, features, or attributes of the Section 4(f) property.”



1 **4.6.4.2 Tucson Mountain Park and Saguaro National Park Assessment**

2 Based on comments from the Bureau of Reclamation, FHWA assessed the potential for
3 constructive use on Tucson Mountain Park and Saguaro National Park. **Appendix F3**
4 (Correspondence Related to Preliminary Section 4(f) Evaluation) provides the detailed
5 constructive use assessment.

6 Noise and visual impacts, combined, would impact the visitor experience at Tucson Mountain
7 Park and Saguaro National Park. However, according to FHWA policy and practice on
8 constructive use, these combined impacts would not be so severe as to substantially impair or
9 diminish the attributes that qualify the parks for protection under Section 4(f). The attributes of
10 each property are listed in **Table 4-1** and **Table 4-2**. Specifically, noise levels with I-11 are
11 predicted to be less than the applicable FHWA noise abatement threshold at Saguaro National
12 Park and Tucson Mountain Park. Also, ADOT has committed to mitigate impacts on night skies
13 by complying with dark skies ordinances and by limiting lighting, if necessary.

14 **4.6.4.3 Public Land Order 1015 Lands and Adjacent AGFD Parcels Assessment**

15 Originally under the jurisdiction of BLM, the Public Land Order 1015 lands were withdrawn from
16 BLM jurisdiction in 1954 under Public Land Order 1015 and “reserved under the jurisdiction of
17 the USFWS for wildlife refuge purposes.” The Public Land Order 1015 lands are
18 owned/administered by USFWS but managed by AGFD. USFWS considers the Public Land
19 Order 1015 lands to be in a special category of lands called “Coordination areas” under the
20 National Wildlife Refuge Act. The adjacent AGFD parcels are in furtherance of the 1954
21 USFWS/AGFD/Pima County Cooperative Agreement, clause 7 (USFWS and AGFD 1954).

22 FHWA and ADOT assessed the potential for the Project to cause a constructive use on the
23 Public Land Order 1015 lands. The assessment focused on Public Land Order 1015 lands on
24 either side of the Recommended Alternative corridor (**Figure 4-33**). **Appendix F2** (Section 4(f)
25 Constructive Use White Papers) provides the detailed constructive use assessment.

26 Based on the assessment, FHWA determined that, if the Recommended Alternative had been
27 selected for further study in Tier 2, the proximity effects of I-11 to Public Land Order 1015 lands
28 would not be so severe that the protected activities, features, or attributes that qualify the
29 properties for protection under Section 4(f) would be substantially impaired. No constructive use
30 of Public Land Order 1015 lands or adjacent AGFD parcels would occur as a result of the
31 Project.

32 **4.7 Corridor-wide Avoidance Analysis**

33 An avoidance analysis was undertaken at the corridor-wide level because a use of properties
34 protected by Section 4(f) potentially would occur as a result of each Build Corridor Alternative,
35 including the Preferred Alternative. In the corridor-wide avoidance analysis, FHWA and ADOT
36 identified avoidance alternatives that would eliminate potential use of Section 4(f) properties and
37 applied the feasible and prudent criteria to those alternatives. Feasible and prudent avoidance
38 alternatives are those that would avoid using any Section 4(f) property and would not cause
39 other problems of a magnitude that would substantially outweigh the importance of protecting
40 the Section 4(f) property (23 CFR 774.17). Alternatives evaluated in the avoidance analysis



1 include the No Build Alternative (2040) and the following types of alternatives as identified in
2 FHWA's *Section 4(f) Policy Paper* (FHWA 2012b):

- 3 • **Location Alternatives.** A location alternative refers to the rerouting of the entire project on a
4 different alignment. Examples of location alternatives are the other Build Alternatives
5 assessed in this Final Tier 1 EIS.
- 6 • **Alternative Actions.** An alternative action involves actions that do not require construction
7 or that consist of a different transit mode.

8 The FHWA *Section 4(f) Policy Paper* also identifies alignment shifts and design changes as
9 types of avoidance (FHWA 2012b). These property-specific types of avoidance strategies are
10 detailed in **Section 4.4.4.1**.

11 **4.7.1 Avoidance Alternative Feasibility and Prudence Standards**

12 Definitions of feasible and prudent alternatives under 23 CFR 774.17 are listed in **Section**
13 **4.4.4.1**. An alternative that potentially would use any Section 4(f) property is not an avoidance
14 alternative.

15 The following subsections evaluate the No Build Alternative (2040) and other potential location
16 alternatives, alternative actions, alignment shifts, and design changes using these feasible and
17 prudent factors. In each case, a discussion of the relevant issues for each alternative is
18 provided and the applicable factor(s) are applied. For some alternatives, the issues relate to a
19 single factor; for other alternatives, multiple factors apply. To be considered a feasible and
20 prudent avoidance alternative as defined by Section 4(f), an alternative has to be assessed as
21 being both feasible from the standpoint of buildability and prudent in terms of achieving the I-11
22 Purpose and Need while having no severe or extraordinary impacts related to safety on the
23 natural and built environments and cost. An avoidance alternative that fails one of the feasible
24 and prudent tests is not a viable avoidance alternative in terms of Section 4(f).

25 The results of the evaluations in the following subsections are that the No Build Alternative
26 (2040) and other potential location alternatives, alternative actions, alignment shifts, and design
27 changes are not feasible and prudent avoidance alternatives.

28 **4.7.2 No Build Alternative (2040)**

29 The No Build Alternative (2040) represents the existing transportation system, along with
30 committed improvement projects that are programmed for funding. These improvements are
31 represented in the federally approved *2017–2021 STIP* (ADOT 2016a). The *2018–2022 Five-*
32 *Year Transportation Facilities Construction Program* (ADOT 2017b) identified several capacity
33 improvements that are in the STIP and are programmed and funded for construction on the
34 interstate and state highway system within the Corridor Study Area by 2022.

35 The No Build Alternative (2040) is expected to avoid the potential use of Section 4(f) properties.
36 However, the No Build Alternative (2040) is not a prudent avoidance alternative under Factor 1.
37 Specifically, the No Build Alternative (2040) would not meet the I-11 Purpose and Need. The No
38 Build Alternative (2040) would not achieve the I-11 Purpose and Need as it would not provide a
39 high priority, high capacity, access-controlled transportation corridor; would not support



1 improved regional mobility for people, goods, and homeland security; would not connect
2 metropolitan areas and markets in the Intermountain West region with Mexico and Canada; and
3 would not enhance access to the high-capacity transportation network to support economic
4 vitality. For these reasons, the No Build Alternative (2040) is not a feasible and prudent
5 avoidance alternative (Factor 1).

6 **4.7.3 Location Alternatives**

7 **4.7.3.1 Use Existing Non-Road Transportation Corridors**

8 Portions of the Build Corridor Alternatives are aligned on and within existing highway corridors
9 such as I-19 and I-10, portions of which parallel but are not within existing BNSF and Union
10 Pacific freight railroad right-of-way. During the alternatives development and screening process,
11 described in Draft Tier 1 EIS **Chapter 2** (Alternatives Considered), portions of the various Build
12 Corridor Alternatives were aligned adjacent to and parallel with linear transportation and utility
13 uses (roadway, railroad, and power line corridors) where possible to minimize impacts. During
14 the Tier 1 EIS scoping and Alternative Selection Report phases, the railroads did not
15 communicate interest or need in sharing existing or new corridors with the project because of
16 ample existing capacity in their networks and their desires to retain their existing right-of-way for
17 potential future expansion. Using existing railroad corridors for the I-11 Corridor would
18 negatively impact the existing and future operations of the railroads by limiting their future
19 options. ADOT would have to acquire additional right-of-way to accommodate both ADOT's
20 project needs and those of the railroads, thereby eliminating the potential benefit of using an
21 existing transportation corridor. As existing railroad corridors in the Corridor Study Area pass
22 through developed areas and alongside existing roadways, potentially severe impacts could
23 result from property acquisitions, displacements, and community disruption. For these reasons,
24 future I-11 alignments would not be aligned within existing railroad right-of-way. FHWA
25 determined that while use of existing freight railroad corridors may be potentially feasible from
26 an engineering perspective, it is not prudent in light of potentially severe social and community
27 impacts (Factor 3). Therefore, using existing non-road transportation corridors is not a feasible
28 and prudent avoidance alternative.

29 **4.7.3.2 Use Existing Roadway Corridors**

30 Also during the alternatives development process, FHWA and ADOT examined the potential to
31 align the Project within existing Corridor Study Area roadways. Potential use of existing roadway
32 corridors was considered early in the project development process when a list of potential
33 alignments was examined by FHWA using the feasible and prudent test. **Chapter 2**
34 (Alternatives Considered) of the Draft Tier 1 EIS summarizes the findings of the screening
35 process, which eliminated potential corridors that either could not be built as a practical matter
36 (infeasible) or had one or more other circumstances that made continued consideration not
37 reasonable. In this revised Draft Preliminary Section 4(f) Evaluation, these results indicate that
38 none of the potential corridors eliminated during the alternatives development process would be
39 both feasible and prudent. Specifically, potential corridors that were assessed as not able to be
40 built as a matter of sound judgment are not feasible. Other potential corridors would not achieve
41 the I-11 Purpose and Need and/or would have one or more engineering, environmental, or cost
42 impacts of extraordinary magnitude (Factors 1 through 6).

1 **4.7.3.3 Tunneling**

2 Placing portions of the Project in a tunnel in downtown Tucson and under the Tucson Mitigation
3 Corridor property was considered in the property-specific avoidance analysis (**Sections 4.6.3.2**
4 **and 4.6.3.3**) as a means to avoid potential impacts to clusters of properties and historic districts.
5 FHWA determined that tunneling could result in a use of one or more Section 4(f) properties
6 and, therefore, is not an avoidance alternative. In addition, tunneling has the potential to impact
7 archaeological sites (Avoidance Analysis Factor 3).

8 **4.7.3.4 Elevated Structures**

9 Elevating I-11 in downtown Tucson to avoid impacting Section 4(f) properties was considered in
10 the property-specific avoidance analysis (**Section 4.6.3.2**). Although the elevated lanes could
11 avoid use of adjacent Section 4(f) properties, noise and visual impacts would result in adverse
12 effects to historic buildings and structures. Deep excavations for the elevated structure
13 foundations would impact archaeological resources. For these reasons, an elevated lanes
14 alternative through downtown Tucson is not an avoidance alternative. The elevated alternative
15 also would impact businesses and residences that are not protected by Section 4(f).

16 **4.7.4 Alternative Actions**

17 **4.7.4.1 Use Existing Facilities**

18 Public input during scoping identified preferences for improving existing freeways and
19 interstates as well as constructing I-11 as a separate, new facility, in part because of recognized
20 congestion problems on existing highways. FHWA and ADOT developed and evaluated
21 alternatives that co-located I-11 with existing transportation facilities, such as I-8, I-10, I-19,
22 SR 85, and SR 93. By 2040, traffic operations on both urban and rural segments of I-10 would
23 deteriorate due to the increased travel demand in the Corridor Study Area. For example, the
24 segment of I-10 between Casa Grande and the southern edge of the Phoenix metropolitan area
25 is projected to operate at LOS C to LOS F in 2040. The Tucson to Casa Grande segment also
26 would experience an increase in traffic congestion, with LOS ranging from LOS C to LOS F by
27 2040. These projected levels of service are at the poor end of the traffic flow condition scale (as
28 illustrated on Draft Tier 1 EIS **Figure 1-6**) and indicate expected delays and the need for
29 transportation improvements to increase travel efficiency.

30 In addition, and as documented in the *Alternatives Selection Report* (ADOT 2017g), some
31 existing non-access-controlled, arterial roadways, such as the Sun Valley Parkway, were initially
32 considered for co-locating I-11. However, these roadways are typically surrounded by built,
33 under construction, or entitled properties, making it challenging to overlay an access-controlled
34 freeway on a functioning arterial with limited future expansion opportunities. An overlay would
35 have to provide for both the arterial and I-11 roadways, causing severe disruption (such as a
36 relatively high number of property impacts and displacements of residences and businesses) of
37 the adjacent, urban environment that would be difficult to mitigate. By comparison and as
38 described in **Section 3.3** (Land Use and Section 6(f)) and **Section 3.5** (Community Resources,
39 Title VI, and Environmental Justice), new corridor alignments (Preferred Alternative west option,
40 Recommended, Purple, and Green Alternatives) are in areas that are less dense than the
41 Preferred Alternative east option and Orange Alternative. The Orange Alternative would impact
42 dense, established communities in downtown Tucson. The Preferred Alternative west option,

1 Recommended, Purple, and Green Alternatives would impact fewer properties and require
2 fewer displacements than the Preferred Alternative east option and Orange Alternative.

3 **4.7.4.2 Alternative Modes**

4 Between Nogales and Phoenix, goods are moved by freight railroad as well as on-road trucking
5 to local and regional destinations. The type of mode by which goods are shipped depends on a
6 combination of several logistical factors, the distance of transport, the types of freight, and the
7 destinations. BNSF Railroad and Union Pacific Railroad operate freight railroad service,
8 transporting goods locally and regionally. During FHWA's and ADOT's outreach to the railroads,
9 BNSF and Union Pacific indicated no specific expansion plans related to the foreseeable growth
10 in freight movement as described in Draft Tier 1 EIS **Chapter 2** (Alternatives Considered). In
11 contrast, on-road trucking is a growth industry in the Corridor Study Area. This is because of a
12 combination of the long-haul nature of the freight movements, the types and variety of freight
13 that are suited to truck transport as opposed to rail transport (such as fresh produce),
14 connections to Mexico through the Mariposa Port of Entry, and the many destinations for that
15 truck freight. As a result, FHWA determined that while using freight rail as an alternative mode
16 may be potentially feasible, using the freight rail mode as an alternative to the Project would not
17 address the logistical needs of moving the freight that is moved by trucks now and into the
18 future. For this reason, the freight rail service mode would not achieve the I-11 Purpose and
19 Need and is not prudent (Factor 1).

20 As the Build Corridor Alternatives also would transport people, FHWA and ADOT considered
21 the ability for existing and planned passenger transit and rail service modes. As described in
22 Draft Tier 1 EIS **Chapter 2** (Alternatives Considered), existing passenger transport between
23 Nogales and Wickenburg, and on to Las Vegas, is provided by private bus companies. The
24 Federal Railroad Administration (FRA) and ADOT completed a Tier 1 NEPA process for a
25 proposed passenger rail service between Tucson and Phoenix. Known as the Arizona
26 Passenger Rail Corridor Study, the Final Tier 1 EIS and Record of Decision identified a corridor
27 for further study (ADOT 2016b). This proposed project, in combination with existing bus
28 services, would address portions of non-freight travel that will occur between Tucson and
29 Phoenix, and future connections north of Phoenix, but would not address future freight
30 transport. For this reason, the passenger rail service mode would not achieve the I-11 Purpose
31 and Need and is not prudent (Factor 1).

32 **4.8 Least Overall Harm Analysis**

33 In accordance with 23 CFR 774.3(2)(c), if the determination is made that there is no feasible
34 and prudent avoidance alternative, FHWA may approve only the alternative that causes the
35 least overall harm in light of the preservation purpose of Section 4(f). ADOT will undertake a
36 least overall harm analysis during Tier 2 studies. At that time, more detailed study of each
37 Section 4(f) property and the potential for impacts to such properties. ADOT will develop and
38 evaluate roadway alignments at a project-level with the goals of avoiding or minimizing impacts
39 on the natural and built environment, including Section 4(f) properties. For example, Tier 2 study
40 will provide the opportunity for ADOT to coordinate further with AGFD during development of a
41 roadway design that is co-aligned with SR 85 adjacent to the Robbins Butte Wildlife Area,
42 incorporate measures to minimize harm, assess use under the Section 4(f) regulations, and
43 identify appropriate mitigation, as needed.

1 During Tier 2, ADOT will examine the Preferred Alternative west and east options in detail and
2 will coordinate with the officials with jurisdiction over potentially affected Section 4(f) properties
3 during the studies and during development of appropriate mitigation measures. These studies
4 and coordination activities will enable completion of a Final Section 4(f) Evaluation that
5 compares the relative impacts and mitigation effectiveness of the options prior to selection of
6 the option with the least overall harm.

7 **4.9 All Planning to Minimize Harm**

8 Throughout alternatives and Final Tier 1 EIS development, FHWA and ADOT applied the
9 following strategies to minimize impacts to Section 4(f) properties:

- 10 • Co-located corridors with existing transportation corridors where reasonably feasible to keep
11 additional right-of-way needs to a minimum
- 12 • Refined corridors to avoid or minimize potential use of Section 4(f) properties (**Section 4.6.2**
13 and **Section 4.6.3**)
- 14 • Coordinated with officials with jurisdiction over Section 4(f) properties to identify such
15 properties early in alternatives development, determine plans for the properties by officials
16 with jurisdiction, and discuss the potential for project impacts on those properties (refer to
17 **Section 4.10**); committed to continued coordination during Tier 2 studies
- 18 • Organized and conducted focus group meetings utilizing the US Institute for Environmental
19 Conflict Resolution (The Udall Foundation)
- 20 • Sought input from stakeholders and the public regarding the effects of the Build Corridor
21 Alternatives on Section 4(f) properties and other resources
- 22 • Considered input from officials with jurisdiction, stakeholders, and the public in the NEPA
23 analyses and Section 4(f) evaluation

24 In addition, through coordination with officials with jurisdiction and the Final Preliminary Section
25 4(f) Evaluation, FHWA and ADOT made the following commitments as part of the Project and
26 identified the following actions to be undertaken in Tier 2. These commitments are
27 supplemented by additional, specific commitments regarding Section 4(f) properties in
28 downtown Tucson (listed in **Section 4.6.3.2**) and the Tucson Mitigation Corridor (listed in
29 **Section 4.6.3.3**):

- 30 • **T2-Section 4(f)-4:** Continue considering ways to avoid use of Section 4(f) properties through
31 engineering design and mitigation.
- 32 • **T2-Section 4(f)-5:** Evaluate the need for and effectiveness of measures to mitigate impacts
33 to Section 4(f) properties. Types of measures to be evaluated include replacement of land
34 and facilities of comparable value and function; compensation; restoration, preservation,
35 interpretation, and recordation (such as for historic structures and properties); and other
36 types of mitigation developed in coordination with the officials with jurisdiction over Section
37 4(f) properties.



- 1 • **T2-Section 4(f)-6:** Continue coordinating with officials with jurisdiction in Tier 2 regarding
2 potential impacts to Section 4(f) properties. Where impacts to Section 4(f) properties
3 potentially would occur, coordination will focus on identifying appropriate and reasonable
4 measures to minimize and mitigate impacts.

- 5 • **MM-Section 4(f)-12:** Avoid the use of specific properties that are partially or entirely within
6 the Build Corridor Alternatives. The properties are identified in the Preliminary Section 4(f)
7 Evaluation and can be avoided by accommodation, shifting the corridor, or grade-separating
8 the corridor.

- 9 • **MM-Section 4(f)-13:** Commit to Tier 2 studies, during which the selected Build Corridor
10 Alternative will be refined to a specific roadway alignment, potential impacts and uses as
11 defined by Section 4(f) will be identified, measures to avoid or minimize impacts to Section
12 4(f) properties will be identified and assessed, measures to mitigate adverse impacts to
13 Section 4(f) properties will be identified, and a Final Section 4(f) Evaluation will be
14 completed, prior to making a final Section 4(f) approval.

4.10 Coordination

4.10.1 NEPA and Section 4(f) Coordination Activities

FHWA and ADOT initiated pre-scoping coordination with federal, state, and local officials with jurisdiction in spring 2016 as part of preparing for the NEPA process. FHWA and ADOT met periodically with officials to share I-11 Corridor Project information and seek input. **Table 4-6** lists the officials with jurisdiction over the Section 4(f) properties identified in this chapter and summarizes the comments each official provided during coordination activities that are relevant to Section 4(f). Correspondence from officials with jurisdiction that is relevant to the Section 4(f) Evaluation is provided in **Appendix F3** (Correspondence Related to Preliminary Section 4(f) Evaluation) of this Final Tier 1 EIS. The dialogue among FHWA, ADOT, and the officials with jurisdiction was used in this revised Draft Preliminary Section 4(f) Evaluation to identify properties that are protected by Section 4(f), assess potential use of the properties by the Build Corridor Alternatives, determine potential means to avoid or minimize potential use of Section 4(f)-protected properties, and identify measures to minimize harm.

Table 4-6. Summary of Comments from Officials with Jurisdiction Over Section 4(f) Properties

Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
Federal Agencies	
NPS	
March 14-15, 2016	<ul style="list-style-type: none"> • NPS comments on concerns related to Saguaro National Park.
April 8, 2016 (Cooperating Agency Meeting)	<ul style="list-style-type: none"> • Concerned with the I-11 Corridor on west side of Saguaro National Park; possible impairment due to designated wilderness, night sky, noise levels, fragmentation, impairment of wildlife movements. • Potential impacts to the Anza Recreation Trail, Anza Auto Tour Route. • Potential impacts to numerous historic and archaeological sites (named).



Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
June 15, 2016	<ul style="list-style-type: none"> Acceptance letter to become a Cooperating Agency. Expressed concern for all National Parks and National Monuments within the 2,000-foot-wide corridor for the I-11 Corridor.
July 11, 2016	<ul style="list-style-type: none"> Comments on the Notice of Intent regarding encroachment on Saguaro National Park through a corridor option bisecting Avra Valley that will be built with the intention of being a multi-use corridor. Irreparable damage to the park and surrounding area for future generations may occur. Other concerns include the Juan Bautista de Anza National Historic Trail and various National Historic Landmarks.
November 3, 2016	<ul style="list-style-type: none"> Requested studies to assess impacts to Wilderness and other values at Saguaro National Park.
December 16, 2016	<ul style="list-style-type: none"> Concerned about potential impacts to National Historic Landmark properties, including the Desert Laboratory and Tumacácori National Monument and Museum.
March 17, 2017	<ul style="list-style-type: none"> Concerned about the proximity of the project to Saguaro National Park, particularly proximity to the Wilderness area of the park; potential direct and indirect effects to wilderness values, air quality, natural sound, viewsheds, night skies, plant communities, and wildlife.
June 2, 2017	<ul style="list-style-type: none"> Expectation of severe and widespread impacts of project on Saguaro National Park and Saguaro Wilderness due to alignments through Avra Valley: plant and animal habitat fragmentation and loss, as well as proximity effects to air quality, noise, viewsheds, and night skies. Evaluate mitigation efficacy plan.
August 31, 2017	<ul style="list-style-type: none"> NPS comments on the Annotated Outline and Methodology Report.
November 3, 2017	<ul style="list-style-type: none"> Saguaro National Park comments on Alternatives Selection Report.
December 19, 2017	<ul style="list-style-type: none"> Meeting notes discussing viewshed, noise, and air quality impacts to areas around the Saguaro National Park.
August 6, 2018	<ul style="list-style-type: none"> Commented regarding project effects on National Park System units, specifically Saguaro National Park.
July 8, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> Expanded evaluation of the Preferred Alternative east option (known at the time as Option B) is needed to compare impacts with those of the Preferred Alternative west option (known at the time as Option D). Questions achievability of a net benefit for the Tucson Mitigation Corridor with Option D. Expanded evaluation of potential for constructive use of Saguaro National Park is needed.
DOI	
July 8, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> Request for individual Section 4(f) evaluation of the Tucson Mitigation Corridor property.
BLM	
April 13, 2016	<ul style="list-style-type: none"> Concerns regarding project effects on national monument properties.



Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
July 13, 2016 (CA Meeting)	<ul style="list-style-type: none"> Project infrastructure would be incompatible with the national monument and wilderness designations (Sonoran Desert National Monument, Ironwood Forest National Monument, Anza National Historic Trail corridor).
February 24, 2017	<ul style="list-style-type: none"> Prefer alternatives west of Vulture Mine RMZ or in the Vulture Mine RMZ multi-use corridor. Vulture Mine RMZ is subject to Section 4(f). Alignment outside the multi-use corridor would require amending the Resource Management Plan for the property.
May 12, 2017	<ul style="list-style-type: none"> Avoid Vulture Mine RMZ, Area of Critical Environmental Concern, wildlife habitat, and other sensitive and natural resources in the area; co-location with power infrastructure in the designated multi-use corridor in the Cooperative Recreation Management Area could reduce impacts.
April 12, 2018	<ul style="list-style-type: none"> FHWA letter to BLM Hassayampa Field Office, Phoenix District regarding Vulture Mine RMZ and the utilization of the multi-use corridor by the future I-11 Corridor.
September 7, 2018	<ul style="list-style-type: none"> Refer to BLM recreation feature as the Vulture Mine RMZ instead of the Vulture Mountains Cooperative Management Recreation Area. Mitigate possible impacts to the race course.
July 8, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> Section 4(f) should apply to Ironwood Forest National Monument and Sonoran Desert National Monument. Request for ongoing coordination among FHWA, ADOT, and specific BLM offices.
October 11, 2019	<ul style="list-style-type: none"> Clarified the property name is Vulture Mine RMZ, not Vulture Mountain.
Bureau of Reclamation	
April 20, 2016 (CA Meeting)	<ul style="list-style-type: none"> Alignment in the Tucson Mitigation Corridor would contradict Tucson Mitigation Corridor goals of reconnecting wildlife habitat across the Avra Valley; language that established the Tucson Mitigation Corridor will help determine whether the property qualifies as a Section 4(f) property. Barrier effect of the project on wildlife connectivity despite recent investment in wildlife crossings of the CAP canal. Effect of Avra Valley alignment on Tumamoc Hill Preserve lands that were set aside to preserve formerly designated endangered Tumamoc globeberry (<i>Tumamoca macdougallii</i>).



Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
July 8, 2016 (Scoping comments letter)	<ul style="list-style-type: none">• Tucson Mitigation Corridor is protected for preservation of wildlife habitat and movements.• Tucson Mitigation Corridor is protected by Section 4(f) because the property was acquired for mitigation purposes.• Canal siphon crossings provide wildlife movement across the CAP canal.• Concern that the I-11 Corridor would fragment habitat and/or be a barrier to wildlife movement through the Tucson Mitigation Corridor or elsewhere in Avra Valley.• Archaeological sites on the Tucson Mitigation Corridor.• Globeberry habitat and individuals to be avoided.• Concern for project-related noise and lighting impacts on wildlife connectivity.• Concern for induced growth and development due to project in Avra Valley and the Tucson Mitigation Corridor.
November 3, 2016 (CA Meeting)	<ul style="list-style-type: none">• Need to clarify language regarding the designation of the land associated with the Tucson Mitigation Corridor.
March 16, 2017	<ul style="list-style-type: none">• Comments on Alternatives Selection Report Evaluation Methodology and Criteria Report.• Concern about effectiveness and detail of evaluation measure and scale of impact when discussing Tucson Mitigation Corridor.
September 18, 2017	<ul style="list-style-type: none">• Ongoing coordination to study I-11 corridor options in the vicinity of the Tucson Mitigation Corridor.• Importance of maintaining already-established, well-used wildlife crossings near canal siphons.• Noise concerns.• Warrant for mitigation for loss of habitat.• Effects on existing trails and future trail planning.
March 5, 2018	<ul style="list-style-type: none">• Bureau of Reclamation preference to align the I-11 Corridor alongside CAP canal (matching wildlife crossings to existing canal siphon crossings) to maintain wildlife connectivity.• Bureau of Reclamation preference is to relocate Sandario Road to reduce barriers to wildlife movements.• Potential for future environmental studies to identify wildlife corridors.
March 26, 2018 (Meeting Notes)	<ul style="list-style-type: none">• Net benefit• Crossings and overpasses• Connectivity to Ironwood Forest National Monument.
June 8, 2018	<ul style="list-style-type: none">• Bureau of Reclamation input and consultation on a Section 4(f) evaluation for the Tucson Mitigation Corridor.
October 18, 2018	<ul style="list-style-type: none">• Preliminary concurrence with mitigation commitments to meet net benefit for the Tucson Mitigation Corridor.• Bureau of Reclamation would provide final concurrence on net benefit during Tier 2.



Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
July 8, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> • Questions ability to achieve a net benefit for the Tucson Mitigation Corridor with Option D. • Questions specific historic property impacts in Tucson with the Preferred Alternative east option (known at the time as Option B). • Requests expanded quantification and comparison of the Preferred Alternative west option and the Preferred Alternative east option (known at the time as Option B and D) impacts. • Requests more use of property impact acreages in the Section 4(f) evaluation. • Request to distinguish between minimization and mitigation measures.
January 2, 2020	<ul style="list-style-type: none"> • Request for an individual Section 4(f) evaluation for the Tucson Mitigation Corridor with Option D. • Requests expanded quantification and comparison of the Preferred Alternative west option and the Preferred Alternative east option (known at the time as Option B and D) impacts. • Provided information on wildlife habitat fragmentation/isolation studies. • Requests evaluation of significance of all Section 4(f) properties. • Identifies members of the Tucson Mitigation Corridor Working Group that Bureau of Reclamation would work with in determining whether minimization and mitigation measures for the Tucson Mitigation Corridor are adequate. • Requests FHWA/ADOT/Bureau of Reclamation coordination in identifying constraints, minimization and mitigation measures for impacts to the Tucson Mitigation Corridor.
US Fish and Wildlife Service	
December 3, 2018	<ul style="list-style-type: none"> • The Public Land Order 1015 lands are owned/administered by USFWS but managed by AGFD. • The Public Land Order 1015 lands are National Wildlife Refuge Act lands (special category of lands called “Coordination Areas”). • The AGFD parcels that are adjacent or near in furtherance of the 1954 DOI/AGFD Cooperative Agreement, clause #7 also are Wildlife Refuge lands.
February 12, 2019	<ul style="list-style-type: none"> • FHWA consultation with USFWS regarding findings of Section 4(f) constructive use evaluation of Public Land Order 1015 lands.
July 8, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> • Questions the ability to achieve a net benefit to the Tucson Mitigation Corridor with Option D. • Expanded Section 4(f) evaluation of the Preferred Alternative east option (known at the time as Option B) is needed.
August 30, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> • Concerned with potential impacts related to corridor through the Tucson Mitigation Corridor. • Concerned with potential impacts to Robbins Butte Wildlife Area with co-aligned SR 85 crossing. • Concerned with potential impacts to wildlife movements in Avra Valley.



Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
US Forest Service	
July 1, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> • CNF does not support Option D of the Recommended Alternative that parallels the CAP canal. • CNF prefers an option co-located with I-10 and I-10 through Pima County. • CNF would like wilderness addressed as a separate resource.
State Agencies	
AGFD	
July 8, 2016 (CA Meeting)	<ul style="list-style-type: none"> • General comment: agency is interested in habitat and wildlife connectivity.
February 1, 2017 (letter)	<ul style="list-style-type: none"> • The Department provided a list of properties it owns or manages in the I-11 Corridor Study Area, along with a status of each.
February 1, 2017 (letter)	<ul style="list-style-type: none"> • “The Department’s position is that the publicly owned portions of the Tucson Mountain Wildlife Area, comprising the Tucson Mountain District of Saguaro National Park, Tucson Mountain Park, and the Tucson Mitigation Corridor, qualify as a Section 4(f) property in the category of a significant state recreation area and state wildlife refuge...” The Department also provided its position regarding Tucson Mountain Wildlife Area, Arlington Wildlife Area, and Powers Butte Wildlife Area.
March 7, 2017	<ul style="list-style-type: none"> • Email and meeting notes discussing the AGFD GIS data provided for the Alternatives Selection Report and Tier 1 EIS.
June 1, 2017	<ul style="list-style-type: none"> • Avoid Vulture Mountain and Avra Valley areas because of high habitat quality and sensitive biological resources. • Concern for habitat fragmentation and loss. • Consider indirect effects of I-11 proximity to natural resources.
August 6, 2018	<ul style="list-style-type: none"> • Impacts to outdoor recreation user experience and revenue generation. • Applicability of Section 4(f) to Public Land Order 1015 lands and determining owner or official with jurisdiction.
July 8, 2019	<ul style="list-style-type: none"> • Section 4(f) should apply to the Tucson Mountain Wildlife Area. • Expanded Section 4(f) Evaluation of the Preferred Alternative east option (known at the time as Option B) in downtown Tucson is warranted for a balanced comparison with the Preferred Alternative west option (known at the time as Option D). • Requests individual Section 4(f) evaluation of the Tucson Mitigation Corridor property. • Public Land Order 1015 lands concerns regarding potential for constructive use due to noise and hunting impacts by highway proximity.



Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
Arizona State Historic Preservation Office	
April 27, 2016 (Pre-scoping)	<ul style="list-style-type: none"> • SHPO suggested that at least three categories of sensitivity be considered. • Potential historic bottlenecks within the Corridor Study Area include Gila River and Ironwood/Picacho Peak areas. • Documentation of the specific De Anza Trail location varies and locations of passes, watering holes, and other features provide the best indication of the historic location. • Tribal trails cross the Corridor Study Area.
June 7, 2016	<ul style="list-style-type: none"> • Preserve historic resources by using existing transportation infrastructure where possible.
September 14, 2016 (Meeting Summary)	<ul style="list-style-type: none"> • Section 106 process overview. • Tribal coordination efforts to date.
April 16, 2018	<ul style="list-style-type: none"> • Concern about prehistoric and historic sites and districts being disrupted by the need to widen I-10 as well as the possible disturbance to unknown historical sites in unsurveyed areas (rural) where the alternatives could be placed.
November 7, 2018	<ul style="list-style-type: none"> • Potential for adverse effects under Section 106 by Orange Alternative in downtown Tucson.
November 23, 2018	<ul style="list-style-type: none"> • Concurrence with adverse impacts from the Orange Alternative historic and Section 4(f) properties in downtown Tucson.
December 19, 2018	<ul style="list-style-type: none"> • Concurrence with adverse impacts from the Orange Alternative to historic and Section 4(f) properties in downtown Tucson. Addressed corrections to November 23, 2018 concurrence to indicate the Barrio El Hoyo and Menlo Park Historic Districts would not be affected and revised the mapping of El Paso and Southwestern Railroad District that would potentially be adversely affected, resulting in a Section 4(f) use.
Arizona State Land Department	
April 14, 2016 (Pre-Scoping)	<ul style="list-style-type: none"> • Property transfers are examined on a case-by-case basis.
July 8, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> • Provision of access to State Trust Land would be a benefit, while I-11 crossing such lands with no access would provide no benefit and would be considered an encumbrance.
January 27, 2020	<ul style="list-style-type: none"> • State Trust lands are not publicly owned; the purpose of such lands is to generate revenue for the land beneficiaries and not for the general public • ASLD does not have an agreement with AGFD for managing lands within the Tucson Mountain Wildlife Area



Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
Arizona State Parks	
July 8, 2016	<ul style="list-style-type: none"> Improving access to parks is important. Potential for co-aligning trails in corridors. Project should avoid or minimize impacts to statewide trails and enable trails to cross the I-11 Corridor. Project should avoid impacts to state parks. Project should avoid Vulture Mountain Recreation Area and ASP-funded projects in the area by keeping alignment west of power line.
October 8, 2020	<ul style="list-style-type: none"> Section 4(f) consultation letter to ASP from FHWA regarding Picacho Peak State Park. Request for verification of location and boundaries, agreement to Section 4(f) protection, and significance of property.
November 6, 2020	<ul style="list-style-type: none"> Slight variance in property boundary for Picacho Peak State Park. Sent new GIS files.
Tribes	
Tohono O’odham Nation	
February 11, 2017	<ul style="list-style-type: none"> Resolution from Schuk Toak District of the Tohono O’odham Nation – Opposition of the I-11 Corridor on or near the Garcia Strip Community.
County Agencies	
Maricopa County	
April 6, 2016 (Pre-scoping)	<ul style="list-style-type: none"> Proposed Maricopa Association of Governments Hassayampa alignment effects on Vulture Mine RMZ: existing and planned off-highway vehicle recreation area, campground, day use area, trail system, east/west recreation opportunities, access, wildlife connectivity. Hassayampa River Preserve impacts to land, wildlife/wildlife connectivity, and noise (traffic). County is looking at acquiring a piece of the Hassayampa River preserve as well. Raptor nesting at Vulture Peak Area of Critical Environmental Concern (BLM).
July 7, 2016	<ul style="list-style-type: none"> Concerns for probable conflicts with local traffic, recreation, and usage of areas in and around Vulture Mine Road. Wildlife habitat and connectivity and neighborhood cohesion are areas of potential impacts. Impacts to local FRSs and dams need to be considered. Possible impacts to the Loop 303 Outfall Drainage Channel, which could negatively affect flooding retention and floodplains in the area. Considerations should be made for air quality and the Maricopa Regional trail.
October 8, 2020	<ul style="list-style-type: none"> Section 4(f) consultation letter to ASP from FHWA regarding Buckeye Hills Regional Park. Request for verification of location and boundaries, agreement to Section 4(f) protection, and significance of property.



Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
October 14, 2020	<ul style="list-style-type: none"> Response to Section 4(f) consultation letter from Maricopa County. Agree that Buckeye Hills Regional Park is protected by Section 4(f), the boundaries are correct, and the property is significant. Provided information and mapping on two new trail crossings for the Maricopa Trail that will bisect Hwy 85.
Pima County	
December 3, 2017	<ul style="list-style-type: none"> Section 4(f) evaluation and constructive use assessment of Tucson Mountain Park. Importance of CAP siphons to wildlife linkages; co-aligning project wildlife crossings with CAP siphons would be a good strategy in terms of enabling linkages to operate in the future. Tucson Mitigation Corridor management agreement is still in place despite stop in funding.
July 8, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> Request for an individual Section 4(f) evaluation of the Tucson Mitigation Corridor with Option D. County should be an official with jurisdiction over the Tucson Mitigation Corridor. The EIS process should provide assurances that sufficient resources will be available to mitigate project impacts. Section 4(f) should apply to Ironwood Forest National Monument and Tucson Mountain Wildlife Area. Questions the thoroughness of the Section 4(f) evaluation of historic properties. Requests consideration of specific factors when developing mitigation measures for Section 4(f) property impacts.
October 29, 2019	<ul style="list-style-type: none"> More detail about the impacts of the Preferred Alternative west option and the Preferred Alternative east option is needed by Pima County The County believes that some mitigation lands in the county's Habitat Conservation Plan qualify for Section 4(f) protection County to provide information about additional properties they believe are protected by Section 4(f) Pima County is not in favor of the No Build option
December 6, 2019	<ul style="list-style-type: none"> Provided information on additional, potential Section 4(f) properties.
Pinal County	
May 31, 2017	<ul style="list-style-type: none"> Impacts to the following properties are of concern: Palo Verde Regional Park, Anza National Historic Trail Corridor, and several planned regional trail and open space corridors.
Municipal	
City of Tucson	
July 8, 2016	<ul style="list-style-type: none"> Participating Agency agreement letter.
August 19, 2016 (106 Consulting Party Acceptance)	<ul style="list-style-type: none"> Historic properties, including archaeological sites and Traditional Cultural Properties, are within the Area of Potential Effects within the City of Tucson and city-owned lands outside the city limits.



Comment Date (Context)	Summary of Comments Related to Section 4(f) Properties
March 17, 2017	<ul style="list-style-type: none"> Comments on Evaluation Methodology and Criteria for Alternatives Selection. Wish to ensure criteria do not favor routes through vacant land over existing freeways; address concerns about water resources; include multimodal improvements; analyze induced growth; analyze economic and social impacts.
November 16, 2017	<ul style="list-style-type: none"> Comments on Alternatives Selection Report. Would like screening methodology to include impacts on water supply (CAVSARP/SAVSARP).
July 1, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> Observes that more analysis and comparison of Options B and D is required in the Section 4(f) evaluation.
October 29, 2019	<ul style="list-style-type: none"> Examine eliminating frontage roads as an alternative to Section 4(f) impacts Location of David G. Herrera and Ramon Quiroz Park is significant Santa Cruz River Park is partly owned by Pima County and partly owned by the City of Tucson, but maintained by the County City is concerned about potential water quality impacts from I-11 traffic in the Preferred Alternative west option Julian Wash Park belongs to Pima County Potential for another neighborhood to become a future historic district Sweetwater Wetlands Park may be expanded in the future
Town of Marana	
July 8, 2019 (Draft Tier 1 EIS Comments)	<ul style="list-style-type: none"> Concerned with the route of the proposed interconnect between I-10 and I-11.
October 8, 2020	<ul style="list-style-type: none"> Section 4(f) consultation letter to the Town of Marana from FHWA regarding El Rio Preserve, Loop Trail (portion in Town of Marana), and San Lucas Community Park. Request for verification of locations and boundaries, agreement to Section 4(f) protection, and significance of properties.
November 9, 2020	<ul style="list-style-type: none"> Response to Section 4(f) consultation letter from the Town of Marana. Agree that the three properties are protected by Section 4(f), the boundaries are correct, and the properties are significant.
Town of Sahuarita	
October 9, 2020 (Signature of agreement on October 8, 2020 FHWA letter)	<ul style="list-style-type: none"> ADOT's depiction of the boundaries of the Sahuarita property is accurate. The Town agrees to contact and coordinate with ADOT when the time comes for the Town to plan and formally designate the property. At that time, and if the Town designates the property as a park, ADOT and the Town could pursue joint planning under Section 4(f).

Source: AECOM. 2020. GIS Analysis. I-11 Section 4(f) Property Export into Excel and Impact Analysis. December 4, 2020.

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1 FHWA considered input from officials with jurisdiction in the development and refinement of the
2 Build Corridor Alternatives. For example, and as described in **Section 4.6.3**, FHWA and ADOT
3 worked with the Bureau of Reclamation to align the Purple and Green Alternatives alongside the
4 CAP canal on the Tucson Mitigation Corridor property as well as relocate and co-align Sandario
5 Road with I-11. By making these modifications, and co-aligning wildlife crossing areas, the
6 barrier effect formed by existing Sandario Road would be removed. The Bureau of Reclamation
7 supports this mitigation measure because of the beneficial effects. Furthermore, the Bureau of
8 Reclamation supports the consolidation of the I-11/CAP canal infrastructure in one location to
9 reduce the potential barrier effect I-11 could cause on the Tucson Mitigation Corridor property.
10 The Bureau of Reclamation's support for these mitigation measures is provided in their letter of
11 June 8, 2018 (**Appendix F3** [Correspondence Related to Preliminary Section 4(f) Evaluation]).

12 ADOT anticipates continuing coordination with other officials with jurisdiction over Section 4(f)
13 properties where a project use has been identified in this evaluation. Such coordination will
14 occur up until the Tier 1 EIS Record of Decision and during Tier 2 studies. Coordination will
15 focus on examining ways to avoid or minimize uses of the Section 4(f) properties and on
16 identifying appropriate mitigation. This coordination activity will enable ADOT to determine the
17 potential for a use and complete the Draft and Final Section 4(f) Evaluation as required to
18 satisfy the requirements of Section 4(f) during Tier 2.

19 FHWA and ADOT also coordinated with the public as required by Section 4(f) regulations
20 (23 CFR 774.5(2)). Public coordination activities for Section 4(f) were combined with the public
21 involvement activities undertaken for the EIS process, documented in **Chapter 5** (Coordination
22 and Outreach) and in **Appendix H** (Comments on Draft Tier 1 EIS and Responses). Key
23 themes among the public comments relevant to Section 4(f) were concerns regarding the
24 potential for I-11 Corridor project impacts to Vulture Mountains, Saguaro National Park, and
25 other protected properties in the area of the Preferred Alternative west option and historic
26 properties in the City of Tucson.

27 **4.10.2 Programmatic Net Benefit for Tucson Mitigation Corridor**

28 In the Draft Tier 1 EIS, FHWA and ADOT assessed the potential for the I-11 Corridor to have a
29 net benefit to the Tucson Mitigation Corridor property. Net benefit is an assessment allowed by
30 the *Final Nationwide Programmatic Section 4(f) Evaluation and Determination for Federal-Aid*
31 *Transportation Projects That Have a Net Benefit to a Section 4(f) Property* (FHWA 2005a). This
32 nationwide programmatic approval is a procedural option for preparing an individual Section 4(f)
33 Evaluation. As defined in FHWA's guidance, *Section 4(f) Evaluation and Approval for*
34 *Transportation Projects That Have a Net Benefit to a Section 4(f) Property*, a net benefit is
35 defined as "achieved when the transportation use, the measures to minimize harm and the
36 mitigation incorporated into the project results in an overall enhancement of the Section 4(f)
37 property when compared to both the future do-nothing or avoidance alternatives and the present
38 condition of the Section 4(f) property, considering the activities, features, and attributes that
39 qualify the property for Section 4(f) protection" (FHWA 2005b).

40 In undertaking the net benefit assessment, FHWA and ADOT examined the potential for
41 alternatives to avoid impacts to Section 4(f) properties, including alternative corridors, elevated
42 structure across the property, and tunneling under the property. FHWA assessed that none of
43 these alternatives would avoid incorporating land from a Section 4(f) property and none would
44 be feasible and prudent.



1 During the assessment, FHWA coordinated with the Bureau of Reclamation regarding the
2 primary purpose and significance of the property; activities, attributes, and features of the
3 property; potential for impacts to the property; potential refinements to the alternative corridors
4 to avoid or minimize impacts to the property; and potential mitigation strategies. Details
5 regarding the property, the potential for Build Corridor Alternative impacts to the property, and
6 the outcomes of coordination activities with the Bureau of Reclamation are presented in **Section**
7 **4.6.3.3** and **Table 4-6** of this revised Draft Preliminary Section 4(f) Evaluation.

8 After publication of the Draft Tier 1 EIS, and after consideration of public and agency comments
9 on these documents, FHWA assessed that more detailed study of the potential impacts of the
10 I-11 Corridor on Section 4(f) properties, including the Tucson Mitigation Corridor, would be
11 required prior to making a final Section 4(f) approval, and FHWA determined that a net benefit
12 determination would no longer be pursued. Instead, Tier 1 studies will include an individual
13 Section 4(f) evaluation of the Tucson Mitigation Corridor property. By taking this approach
14 during Tier 2, FHWA is committing to more detailed study and comparison of the Preferred
15 Alternative west option and the Preferred Alternative east option, as well as more coordination
16 with the officials with jurisdiction over Section 4(f) properties, and consideration of public and
17 agency comments on the Section 4(f) Evaluation, prior to making a final determination of the
18 option with the least overall harm to Section 4(f) properties.

19 **4.11 Summary of Findings**

20 This revised Draft Preliminary Section 4(f) Evaluation assessed five Build Corridor Alternatives:
21 the Preferred Alternative west option and Preferred Alternative east option; Recommended
22 Alternative; and Purple, Green, and Orange Alternatives from the Draft Tier 1 EIS. The
23 Recommended, Purple, Green, and Orange Alternatives would only advance one of the
24 corridors to Tier 2 study. In contrast, the Preferred Alternative from the Final Tier 1 EIS includes
25 two options for further study in Tier 2. As part of the Preferred Alternative, FHWA and ADOT
26 identified specific commitments regarding Tier 2 studies. Specifically, ADOT will refine the
27 corridor to a specific roadway alignment, identify and assess potential impacts and uses of
28 Section 4(f) properties as defined by Section 4(f), evaluate measures to avoid or minimize
29 impacts to Section 4(f) properties, identify and commit to measures to mitigate adverse impacts
30 to Section 4(f) properties, and complete a Final Section 4(f) Evaluation prior to FHWA making a
31 final Section 4(f) approval. In each of these activities, ADOT will coordinate with the officials with
32 jurisdiction over properties potentially impacted by the I-11 Corridor.

33 **4.12 Future Tier 2 Analysis**

34 As set forth in 23 CFR 774.7(e)(1), FHWA has completed a revised Draft Preliminary Section
35 4(f) Evaluation in this Final Tier 1 EIS, including avoidance alternatives, measures to minimize
36 harm, and potential use analysis. ADOT will complete a Tier 2 Section 4(f) Evaluation during
37 Tier 2 analyses. At that time, the Section 4(f) Evaluation will analyze the specific roadway
38 alignment for potential uses of Section 4(f)-protected properties including historic sites
39 determined to be eligible during the Section 106 process. During Tier 2 and prior to making a
40 final Section 4(f) approval, ADOT will make final determinations of use, assess avoidance and
41 least overall harm as warranted, and identify additional specific measures to minimize harm.



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5 COORDINATION AND OUTREACH

Coordination and outreach are fundamental components of effective transportation planning and the NEPA process. The NEPA process promotes informed decision-making by considering potential social, economic, and environmental impacts. Throughout the development of this Tier 1 EIS, FHWA and ADOT have engaged federal, state, regional, county, local, and tribal governments, as well as the general public. This chapter is a summary of outreach and engagement activities.

5.1 Summary of Outreach and Coordination for Draft Tier 1 EIS

This section summarizes Cooperating and Participating Agencies activities, as well as major outreach and engagement, that occurred prior to the publication of the Draft Tier 1 EIS. Major outreach opportunities prior to publication of the Draft Tier 1 EIS included pre-scoping, scoping, agency/public information meetings, and recurring agency coordination meetings. Further detail and information on the outreach described below can be found in **Chapter 5** (Coordination and Outreach) and **Appendix G** (Public Involvement Materials) of the Draft Tier 1 EIS.

Cooperating and Participating Agencies: FHWA and ADOT requested local and federal agencies and tribal governments participate in the environmental review process by inviting them to be a Cooperating Agency or a Participating Agency under NEPA guidelines. In addition, agencies and others were invited to participate as consulting parties under Section 106 of the NHPA (see **Section 3.7** [Archaeological, Historical, Architectural, and Cultural Resources]). There are a total of 10 Cooperating Agencies; their roles and responsibilities have included early and regular participation in the NEPA process, and providing comments and guidance on major deliverables such as the Scoping Summary Report, Purpose and Need, Alternatives Selection Report Evaluation Methodology, Administrative Draft Tier 1 EIS, and Administrative Final Tier 1 EIS. Cooperating Agencies have continued to meet on a monthly basis as needed throughout the NEPA process.

There are 51 Participating Agencies; their roles and responsibilities have included early and regular participation, providing input on issues of concern, and review of the Draft Tier 1 EIS during the public review period. Meetings with Participating Agencies have occurred on an as-needed basis as issues arise. Four Participating Agencies that comprise the municipal planning organizations and/or Council of Governments within the Study Area participate in the Project Management Team and Executive Leadership Team: Maricopa Association of Governments (MAG), Pima Association of Governments (PAG), Sun Corridor Municipal Planning Organization (SCMPO), and South Eastern Arizona Governments Organization (SEAGO). The Project Management Team is a staff-level group that meets bi-monthly with FHWA and ADOT to discuss project status and provide feedback on current planning activities. The Executive Leadership Team meets quarterly as needed to keep executive leadership at FHWA, ADOT, MAG, PAG, SCMPO, and SEAGO apprised of current project status, and outstanding issues and provides collaborative guidance on key decision points. More detail on Cooperating Agencies, Participating Agencies, and agency coordination opportunities can be found in Draft Tier 1 EIS **Section 5.1.3** (Agency Coordination Opportunities).



1 **Pre-scoping Activities:** Pre-scoping activities occurred from March to May 2016, prior to the
2 formal start of the NEPA process. They offered an early opportunity to elicit information, issues,
3 and concerns, and discuss the Tier 1 EIS process with the agencies and other key stakeholders
4 in advance of formal scoping for the NEPA process. Approximately 50 pre-scoping meetings
5 were held with federal, state, regional, county, local, and tribal governments, as well as other
6 stakeholders.

7 **Agency and Public Scoping:** A 45-day scoping period held from May 23 to July 8, 2016, was
8 initiated by the publication of the *Notice of Intent to Prepare a Tier 1 EIS* in the Federal Register
9 in May 2016 (81 FR 32007). The purpose of scoping is to identify major issues and establish the
10 scope of the NEPA analysis. A preliminary Study Area presented to agencies and the public for
11 comment during the scoping process was established by the prior *I-11 and Intermountain West*
12 *Corridor Study* (NDOT and ADOT 2014). The input FHWA and ADOT received during scoping
13 helped identify the opportunities and constraints in the Study Area, the range of alternatives to
14 be studied, and approach and methodology for the environmental analysis.

15 FHWA and ADOT invited agencies, tribal governments, and organizations by letter to participate
16 in the scoping process and attend agency scoping meetings. Three agency scoping meetings
17 were held in the following locations: Casa Grande, Phoenix, and Tucson. Scoping activities also
18 included six public scoping meetings. The public was notified about the scoping process, public
19 scoping meeting locations, and schedule via newspaper advertisements, the project website
20 (i11study.com/Arizona), e-mail blasts, social media, news releases, media interviews, and blog
21 posts on the project website and ADOT website. The six public scoping meetings were held in
22 Nogales, Tucson, Marana, Casa Grande, Buckeye, and Wickenburg.

23 **Agency and Public Outreach During Alternatives Development:** Agency and public
24 information meetings were held in May 2017, which coincided with an approximately 30-day
25 comment period on the Alternatives Selection Report from April 28 to June 2, 2017. The
26 purpose of these meetings and comment period was to provide an update on project progress,
27 solicit input on preliminary recommendations for alternatives to carry forward into the Draft Tier
28 1 EIS, and continue to collect information on key issues to be evaluated in the Draft Tier 1 EIS.
29 Similar to the scoping meetings, six public information meetings were held in Nogales, Tucson,
30 Marana, Casa Grande, Buckeye, and Wickenburg. Four agency meetings were held in Tucson,
31 Marana, Casa Grande and Avondale to solicit comments from cooperating and participating
32 agencies and tribal governments. During the alternatives development period, Cooperating and
33 Participating Agencies also had the opportunity to review and provide input on key project
34 documents, including the *I-11 Tier 1 Purpose and Need Memorandum* (ADOT 2017k),
35 *Alternatives Selection Report Evaluation Methodology and Criteria Report* (ADOT 2017f), and
36 *Alternatives Selection Report* (ADOT 2017g).

37 In addition to outreach specific to the major milestones, the Project Team also met with agency
38 stakeholders on a regular basis. Recurring agency meetings include bi-monthly project
39 management team meetings, monthly cooperating agency meetings, and as-needed
40 coordination meetings with participating agencies, FHWA, ADOT, and stakeholder agency
41 leadership.

42 **Tribal Engagement:** Tribes were invited to attend agency and stakeholder meetings at each
43 major milestone throughout the study process (2016 scoping activities and 2017 agency and
44 public information meetings as previously described). The Ak-Chin Indian Community, Gila
45 River Indian Community, Pascua Yaqui Tribe, and Tohono O'odham Nation were engaged as

1 participating agencies throughout the planning process. A series of smaller meetings occurred
2 with the Ak-Chin Indian Community, Gila River Indian Community, Salt River Pima-Maricopa
3 Indian Community, Tohono O’odham Nation, Pascua Yaqui Tribe, and other tribal governments
4 that requested individual meetings.

5 **Additional Stakeholder Engagement:** Throughout the NEPA process, the Project Team has
6 received input and requests for coordination meetings with individual stakeholders as issues
7 arose. In response to stakeholder input focused on the Pima County area, FHWA and ADOT
8 invited the US Institute for Environmental Conflict Resolution, a neutral third party, to facilitate a
9 focused discussion with Pima County stakeholders to better understand the values, interests,
10 and characteristics most important to them. Two stakeholder groups participated in a series of
11 six meetings between March and April 2018. Documentation of each meeting is available on the
12 I-11 study website at i11study.com/Arizona. The US Institute for Environmental Conflict
13 Resolution prepared the final report documenting this meeting process, which is included in
14 **Appendix H** (Stakeholder Input) of the Draft Tier 1 EIS.

15 5.2 Draft Tier 1 EIS Outreach and Public Review Period

16 On April 5, 2019, FHWA published a notice of availability for the Draft Tier 1 EIS (84 FR 13662).
17 An Errata to the Draft Tier 1 EIS was prepared to include a section of the document missing
18 from the April 5, 2019, publication; it was made available for review on the project website on
19 April 25, 2019, and the comment period was extended through July 8, 2019 (84 FR 18634).
20 During the public review period, FHWA and ADOT conducted agency outreach and a public
21 hearing process to provide opportunities for comment. Six public hearings were held throughout
22 the Study Area and are listed in **Table 5-1. Appendix G** (Public Involvement Summary Report)
23 provides more detailed information on public hearings and the outreach process for the public
24 hearings.

25 **Table 5-1. Public Hearings (2019)**

Date	Time	Location	Attendance
April 29, 2019	5 p.m. - 8 p.m.	Palo Verde Energy Education Center 600 North Airport Road Buckeye, AZ 85326	430
April 30, 2019	4 p.m. - 7 p.m.	Wickenburg Community Center 160 North Valentine Street Wickenburg, AZ 85390	103
May 1, 2019	5 p.m. - 8 p.m.	Holiday Inn 777 North Pinal Avenue Casa Grande, AZ 85122	161
May 7, 2019	5 p.m. - 8 p.m.	Quality Hotel Americana 639 North Grand Avenue Nogales, AZ 85621	35
May 8, 2019	4 p.m. - 7 p.m.	Tucson Convention Center 260 South Church Hill Avenue Tucson, AZ 85701	226
May 11, 2019	11 a.m. - 4 p.m.	Marana High School 12000 West Emigh Road Marana, AZ 85743	392



1 The public hearings provided opportunities for the public and agencies to comment on the Draft
2 Tier 1 EIS and review materials from the Draft Tier 1 EIS. Public hearings provided several
3 methods for submitting comments, including the ability to comment live to a hearing panel and
4 attendees, along with submitting comments via court reporters, hard copy comment forms, and
5 access to online comment forms. Comments could also be submitted via telephone, submitted
6 via the study email, mailed to ADOT, or submitted through the I-11 study website
7 (i11study.com/Arizona/) at any time throughout the public review period from April 5 through
8 July 8, 2019.

9 The Draft Tier 1 EIS public comment period and public hearings were also advertised through
10 newspaper ads in regional and statewide publications, mailers to addresses within half a mile of
11 the corridor, the project website (i11study.com/Arizona/), news releases, radio ads, emails to
12 the project email list, media interviews, and social media posts.

13 **5.3 Title VI, Environmental Justice, and Limited English** 14 **Proficiency**

15 Various federal laws and executive orders have been enacted to protect low-income and
16 minority populations. Title VI of the Civil Rights Act of 1964 prohibits discrimination based on
17 race, color, or national origin, including individuals with limited English proficiency. The intent of
18 consideration for individuals with limited English proficiency or impacted low-income and or
19 minority populations is to ensure they are provided meaningful access to information regarding
20 government programs or services; a failure to address this could potentially cause
21 discriminatory disparate impacts. **Section 3.5** (Community Resources, Title VI, and
22 Environmental Justice) and Draft Tier 1 EIS **Appendix E5** (Demographic Data to Support the
23 Title VI, Environmental Justice, and Limited English Proficiency Analysis) contain more detail on
24 these populations as well as tabular demographic data.

25 Executive Order 13166 requires federal agencies to assess and address the needs of otherwise
26 eligible persons seeking access to federally conducted programs and activities who, due to
27 limited English proficiency, cannot fully and equally participate in or benefit from those programs
28 and activities. According to the Department of Justice, "Individuals who do not speak English as
29 their primary language and who have a limited ability to read, speak, write, or understand
30 English can be limited English proficient. These individuals may be entitled [to] language
31 assistance with respect to a particular type or service, benefit, or encounter." The Department of
32 Justice Limited English Proficiency Guidance, in turn, advises each federal department or
33 agency to "take reasonable steps to ensure 'meaningful' access [to LEP individuals] to the
34 information and services they provide."

35 In addition to regulations related to limited English proficiency, ADOT's standard procedures for
36 public involvement require census data be analyzed to identify the most prominent languages
37 that are spoken within the Study Area and determine the translation and interpretation needs for
38 the project. Refer to Draft Tier 1 EIS **Appendix E5** (Demographic Data to Support the Title VI,
39 Environmental Justice, and Limited English Proficiency Analysis) for the census data. The
40 census data indicated that translation of the Spanish language would be necessary throughout
41 the public involvement process. Spanish interpreters were present at public hearings.

42 In the context of transportation, effective and equitable decision-making depends upon
43 understanding and properly addressing the unique needs of different socioeconomic groups.



1 One of the fundamental principles of the USDOT Environmental Justice Strategy is “[t]o ensure
2 the full and fair participation by all potentially affected communities in the transportation
3 decision-making process.” To ensure that everyone received an equal opportunity to participate,
4 FHWA and ADOT have taken several measures to meet the intent, guidelines, and
5 requirements of Title VI, environmental justice, and limited English proficiency. The following
6 standards were in place for each public meeting and hearing:

- 7 • An ADOT Communications team representative attended the public meetings and public
8 hearings and provided information about the public’s rights to ADOT’s nondiscrimination
9 programs. “Your Nondiscrimination Rights Under Title VI/ADA” brochures (in both English
10 and Spanish) were provided to attendees.
- 11 • In order to meet the federal requirement to collect demographic data of meeting attendees,
12 the opportunity was provided for attendees to complete the voluntary “Title VI Self
13 Identification Survey” card.
- 14 • The opportunity to request accommodations and modifications under the Americans with
15 Disabilities Act of 1990 (ADA) was provided in all public meeting and public hearing
16 advertising.
- 17 • Materials were provided in Spanish and English. Spanish interpreters were present at each
18 hearing and other translation services were available upon request.

19 Following an evaluation of the Study Area’s demographic data related to Title VI, limited English
20 proficiency, and environmental justice, FHWA and ADOT identified techniques to address and
21 reduce linguistic, cultural, institutional, geographic, and other barriers to meaningful
22 participation. Those techniques included:

- 23 • Translating all public involvement materials (included newspaper advertisements) into
24 Spanish, as well as other languages, such as Chinese, upon request.
- 25 • Providing Spanish interpretation at all public meetings and hearings, as well as other
26 languages, upon request.
- 27 • Adding an automatic online translator to the study website, allowing translation of website
28 text into approximately 100 languages, including Chinese and Vietnamese, for populations
29 found within the Study Area.
- 30 • Including Spanish language materials and graphics for download on the study website, as
31 well as other languages upon request.
- 32 • Establishing a bilingual study hotline both in English and Spanish (1-844-544-8049).
- 33 • Integrating elected officials, intergovernmental liaisons, and special interest groups into the
34 process.
- 35 • Coordinating, implementing, and documenting communications protocols with the 4 adjacent
36 and 22 statewide tribal governments.
- 37 • Using advertising and graphics to reach broader audiences.



- 1 • Holding public meetings and hearings in locations throughout the I-11 Corridor and Study
2 Area that are easily accessible and ADA compliant.
 - 3 • Holding public meetings and hearings along transit lines for those who are transit
4 dependent.
 - 5 • Providing reasonable accommodations, such as sign language interpreters, upon request.
- 6 Exhibits of bilingual meeting notifications and materials are included in Draft Tier 1 EIS
7 **Appendix G** (Public Involvement Materials), which includes the *I-11 Tier 1 EIS Scoping*
8 *Summary Report* (ADOT 2017I) and the *Agency and Public Information Meeting Summary*
9 *Report* (ADOT 2017e). Many of these overlap with tools that also reach the public at large, with
10 a goal of providing access so that everyone can participate.
- 11 All outreach and public involvement materials from all public meetings and public hearings that
12 have been held since the beginning of the study process can be accessed via the I-11 study
13 website at i11study.com/Arizona.

14 5.4 Comments on Draft Tier 1 EIS

15 The comment period for the Draft Tier 1 EIS was open to the public from April 5 through July 8,
16 2019. During this period, members of the public, cooperating agencies, participating agencies,
17 tribes, and other organizations and individuals submitted comments on the Draft Tier 1 EIS. The
18 Project Team received 12,445 comment submissions through the comment channels during the
19 official comment period. **Table 5-2** and **Table 5-3** summarize the number of comments by
20 source and form, respectively. **Figure 5-1** shows the geographic distribution of comments within
21 Arizona.

22 **Table 5-2. Source of Comments**

Source	Number of Comments Received
Individuals	3,545
Individual comments originating from national email campaigns including National Parks Conservation Association (npca@npca.com), Sierra Club (@knowwho.com), and (@everyactioncustom.com)	8,751
Businesses, Organizations, Other Agencies, and Elected Officials	101
Cooperating Agencies	9
Participating Agencies	35
Tribes	4
Total	12,445

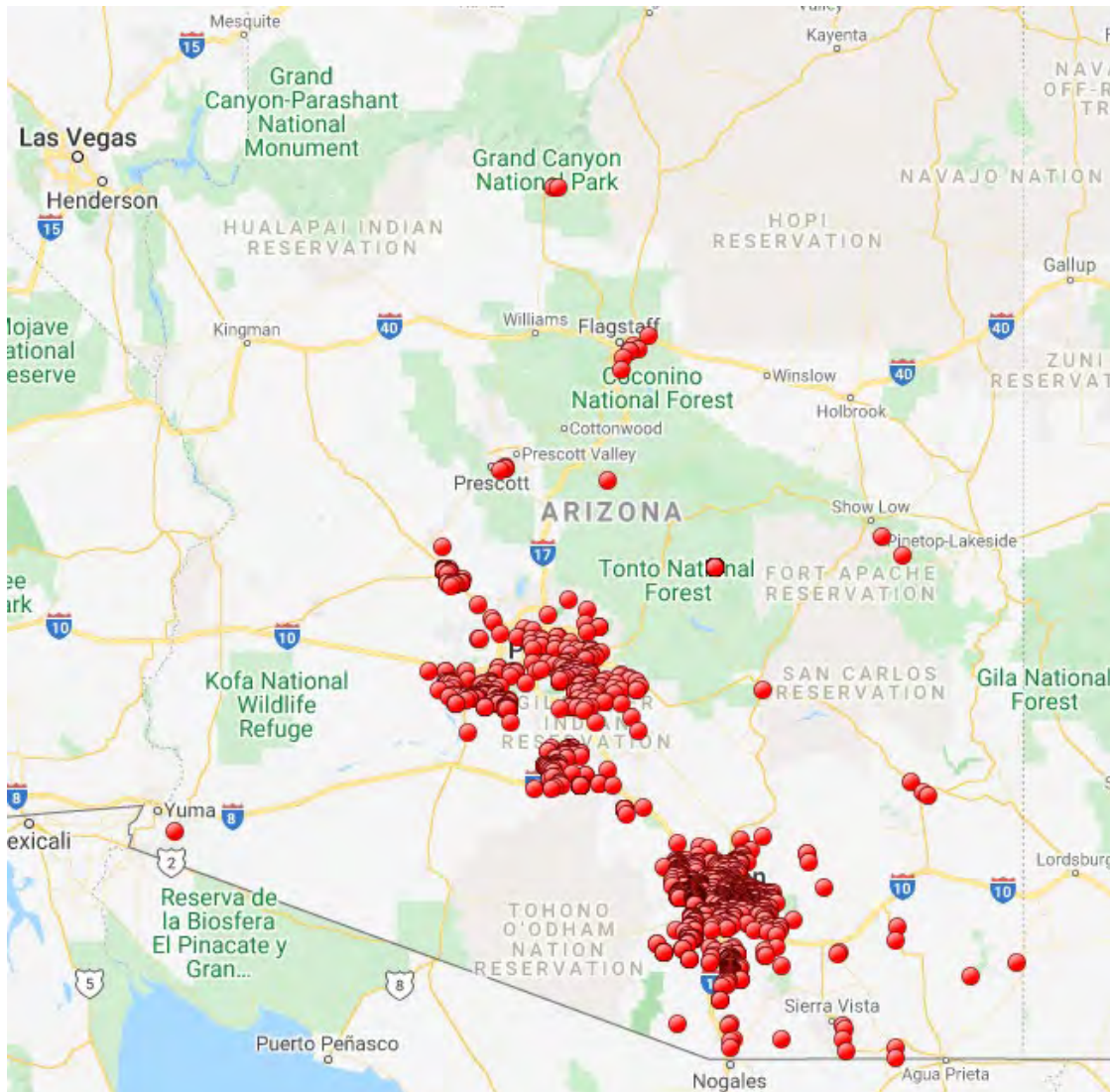
23 Note: The numbers above are a general representation and reflect the number of comment entries in the comment database. These
24 may not match the number of responses in **Appendix H** (Comments on Draft Tier I EIS and Responses) because some comments
25 were submitted more than once.

1

Table 5-3. Form of Comments

Form	Number of Comments Received
Website (http://i11study.com/Arizona/Documents.asp)	2,608
Handwritten	43
Oral Testimony (at Public Hearings)	248
Email	9,166
Other	33
Phone	252
Mail	95
Total	12,445

2



3

4

Figure 5-1. Distribution of Public Comments Originating in Arizona

1 Each section of **Chapter 3** (Affected Environment and Environmental Consequences)
 2 summarizes comments relating to specific resources (e.g., air quality). **Chapter 4** (Draft
 3 Preliminary Section 4(f) Evaluation) summarizes comments to the Section 4(f) Evaluation.
 4 **Chapter 6** (Preferred Alternative) summarizes comments related to alternatives.

5 All comments received during the April 5 through July 8, 2019, comment period are addressed
 6 in **Appendix H** (Comments on Draft Tier I EIS and Responses) of this Final Tier 1 EIS. Several
 7 agencies submitted letters outside of the official comment period containing supplementary
 8 information or additional comments on the Draft Tier 1 EIS. Those comment letters are also
 9 included in **Appendix H**.

10 5.5 Coordination and Outreach Since Draft Tier 1 EIS

11 Following the close of the Draft Tier 1 EIS public comment period on July 8, 2019, the Project
 12 Team focused its efforts on reviewing and understanding comments. The Project Team
 13 continued to accept input and meet with agency partners.

14 **Agency:** Agency outreach and coordination following the formal comment period for the Draft
 15 Tier 1 EIS included one-on-one meetings with agency stakeholders so that FHWA and ADOT
 16 could gain a better understanding of comments and potential solutions to address concerns, as
 17 well as recurring cooperating agency, project management team, and executive leadership
 18 team meetings. **Table 5-4** lists the agency coordination opportunities after the publication of the
 19 Draft Tier 1 EIS to the present.

20 **Table 5-4. Agency Coordination Opportunities**

Agency Coordination	Dates	Purpose and Outcomes
Cooperating Agency Meetings	Monthly, July 2019 – present	Convene FHWA, ADOT, and cooperating agencies to discuss project status, coordinate on related projects or pertinent issues, and review draft project materials
Cooperating Agency Comment Discussion Meetings	August 2019	Convene FHWA, ADOT, and cooperating agencies to discuss agency comments on the Draft Tier 1 EIS
Cooperating Agency Review of Administrative Final EIS	January – February 2021	Cooperating agencies were provided the opportunity to review and comment on the administrative draft of the Final Tier 1 EIS
Project Management Team Meetings	Every other month, July 2019 - present	Convene FHWA, ADOT, and metropolitan planning organizations to discuss project status and coordinate on related projects or pertinent issues
Executive Leadership Team	Quarterly (as-needed), July 2019 – present	Executive-level meetings to discuss project status, upcoming outreach activities, and outstanding issues among FHWA, ADOT, and metropolitan planning organization leadership



Agency Coordination	Dates	Purpose and Outcomes
Individual Agency Meetings	Throughout entire process	Individual meetings with individual agencies or tribes as requested or in response to project issues.

1

2 **Tribal:** Tribal coordination meetings generally included elected officials and staff members from
 3 transportation, community development, agriculture and natural resources, planning and zoning,
 4 and/or economic development. **Table 5-5** lists the major points of tribal coordination that
 5 occurred between January 2019 and September 2020.

6

Table 5-5. Tribal Engagement (2019–2020)

Date	Engagement Activity	Outcome/Activity
May 9, 2019	Coordination meeting with the Four Southern Tribes	Overview of the Draft Tier 1 EIS public review period, public hearings, and materials available for review
October 3, 2019	Coordination meeting with Colorado River Indian Tribes	General overview of the I-11 project
November 26, 2019	Coordination meeting with Pascua Yaqui Tribe	General overview of the I-11 project
December 3, 2019	Coordination meeting with Tohono O'odham Tribe San Xavier District	General overview of the I-11 project
December 11, 2019	Fort Yuma Quechan Tribe	General overview of the I-11 project
January 9, 2020	Government-to-government consultation with Colorado River Indian Tribes	Government-to-government consultation
February 11, 2020	Tohono O'odham Sif Oidak District	General overview of the I-11 project
February 12, 2020	Tohono O'odham Agriculture/Natural Resources Committee – TON Legislative Council	General overview of the I-11 project
March 2021	Letter sent to 22 tribes	General I-11 update and request for input on public involvement opportunities during public review period for the Final Tier 1 EIS
June 2021	Coordination meeting with the Four Southern Tribes	Overview of I-11 project and Final Tier 1 EIS status

7

5.6 Next Steps and Final Tier 1 EIS Public Review Process

8 This Final Tier 1 EIS will be available for a 30-day review period for federal, state, local
 9 agencies and private organizations, and members of the public who provided substantive
 10 comments on the Draft Tier 1 EIS (23 CFR 771.125(f)). Outreach efforts for the Final Tier 1 EIS
 11 will include publication of a Notice of Availability in the Federal Register and local newspapers
 12 (23 CFR 771.125(f)), news releases, GovDelivery (email) notices, notification letters to
 13 Cooperating and Participating Agencies, and notice on the study website. Comments will be
 14 collected, but public hearings will not be held. FHWA and ADOT will publish a Record of



- 1 Decision no sooner than 30 days after publication of the Final Tier 1 EIS. The Record of
- 2 Decision will present a Selected Alternative, describe the basis for the decision, and list
- 3 mitigation measures that ADOT has committed to implement during Tier 2 studies if a Build
- 4 Corridor Alternative is chosen.

- 5 If a Build Corridor Alternative is selected, it would be further evaluated and refined during Tier 2
- 6 analyses. Tier 2 environmental studies will be conducted in accordance with NEPA and related
- 7 environmental statutes and regulations, including any requirements for agency coordination and
- 8 public review. Continuing coordination with tribes, the public, and agencies would occur prior to
- 9 and during Tier 2 project-level analyses.

10



6 PREFERRED ALTERNATIVE

This chapter summarizes the issues and concerns with the Recommended Alternative in the Draft Tier 1 EIS and how public and agency comments were considered in identifying a Preferred Alternative in this Final Tier 1 EIS.

6.1 Summary of Recommended Alternative in the Draft Tier 1 EIS

FHWA and ADOT identified a Recommended Alternative in the Draft Tier 1 EIS that best met the I-11 Purpose and Need while minimizing the potential for adverse impacts, as shown on **Figure 6-1**. The Recommended Alternative is a hybrid of the Purple, Green, and Orange Alternatives. It represents the preliminary findings of the Tier 1 EIS process as of March 2019, including impact analysis and agency, tribal, and public input. Considerations in identifying the Recommended Alternative, including adverse impacts and beneficial effects, are discussed in **Section 6.2** (Recommended Alternative, Differentiating and Substantive Impacts) of the Draft Tier 1 EIS.

The rationale for the Recommended Alternative in the Draft Tier 1 EIS is as follows:

I-19: Nogales to Sahuarita The Recommended Alternative (Option A) would provide access to high-growth areas, achieve LOS C throughout the I-11 Corridor, and serve key economic centers while avoiding impacts to sensitive environmental resources.

Sahuarita to Marana The Recommended Alternative (Option D) is part of an end-to-end alternative that would reduce travel time between Nogales and Wickenburg compared to the No Build Alternative and achieve LOS C or better throughout the I-11 Corridor. It would attract and divert traffic from existing roadways. Option D would provide an alternate regional route to I-10, facilitating efficient mobility for emergency evacuation and defense access. It avoids unmitigable impacts to communities as well as historic districts and structures (Section 4(f) resources in downtown Tucson). The CAP Design Option and a number of additional mitigation strategies were developed to address impacts to the Tucson Mitigation Corridor.

Marana to Casa Grande The Recommended Alternative (Option F) is part of an end-to-end alternative that would reduce travel time between Nogales and Wickenburg compared to the No Build Alternative and achieve LOS C or better throughout the I-11 Corridor. As an alternate regional route, Option F (Recommended Alternative) would provide access to planned growth areas and serve key economic centers in Marana, Eloy, and Casa Grande. Option F would attract and divert traffic from existing roadways. It is consistent with local and county-level planning and commits to mitigation measures to minimize impacts on floodplains.



Casa Grande to Buckeye	The Recommended Alternative (Options I2, L, N, and R) would provide an alternate regional route in an area where there are no high-capacity transportation facilities. This corridor would provide access to planned growth areas and serve key economic centers in western Maricopa and Pinal Counties. The new corridor would reduce travel time for long-distance traffic from Nogales to Wickenburg, achieve LOS C throughout I-11, and effectively attract and divert traffic from existing roadways. It also is consistent with local and county plans. The Recommended Alternative includes mitigation strategies developed to address the impacts of a new Gila River crossing.
Buckeye to Wickenburg	The Recommended Alternative (Hybrid Option U/X) would provide an alternate regional route and access to planned growth areas, reduce travel time for long-distance traffic between Nogales and Wickenburg, and meet LOS C on I-11. It would effectively attract and divert traffic from existing roadways and serve key economic centers in the Hassayampa Valley and western Maricopa County. It is consistent with local land use and transportation plans and includes measures to mitigate impacts to the Vulture Mine RMZ.

1 **6.2 No Build Alternative**

2 A No Build Alternative is the baseline for comparison to the Build Corridor Alternatives and is
3 evaluated as a full alternative in this EIS. The No Build Alternative represents the existing
4 transportation system, along with committed improvement projects that are programmed for
5 funding. These improvements are represented in the federally approved STIP (ADOT 2019a).
6 Projects in this program are consistent with the statewide long-range transportation plan and
7 metropolitan transportation improvement programs.

8 Under the No Build Alternative, travel between Nogales and Wickenburg would use the existing
9 corridors of I-19 and I-10 within the Study Area, along with a connection to Wickenburg via the
10 Phoenix metropolitan area. This connection could take many routes, depending on traveler
11 preference (e.g., SR 101L, SR 202L, SR 303L, I-17, SR 74, US 60). Draft Tier 1 EIS **Table 1-3**
12 in **Chapter 1** (Purpose and Need) provides the various routing options, distances, travel times,
13 and average speeds. This information was generated by the AZTDM maintained by ADOT
14 (ADOT 2017h).

15 The No Build Alternative includes new capacity (additional lanes) on I-10 between Tucson and
16 Casa Grande, operational and capacity improvements to a 3-mile segment of US 93 through
17 Wickenburg, and other capacity improvements detailed on **Figure 6-2**.

18

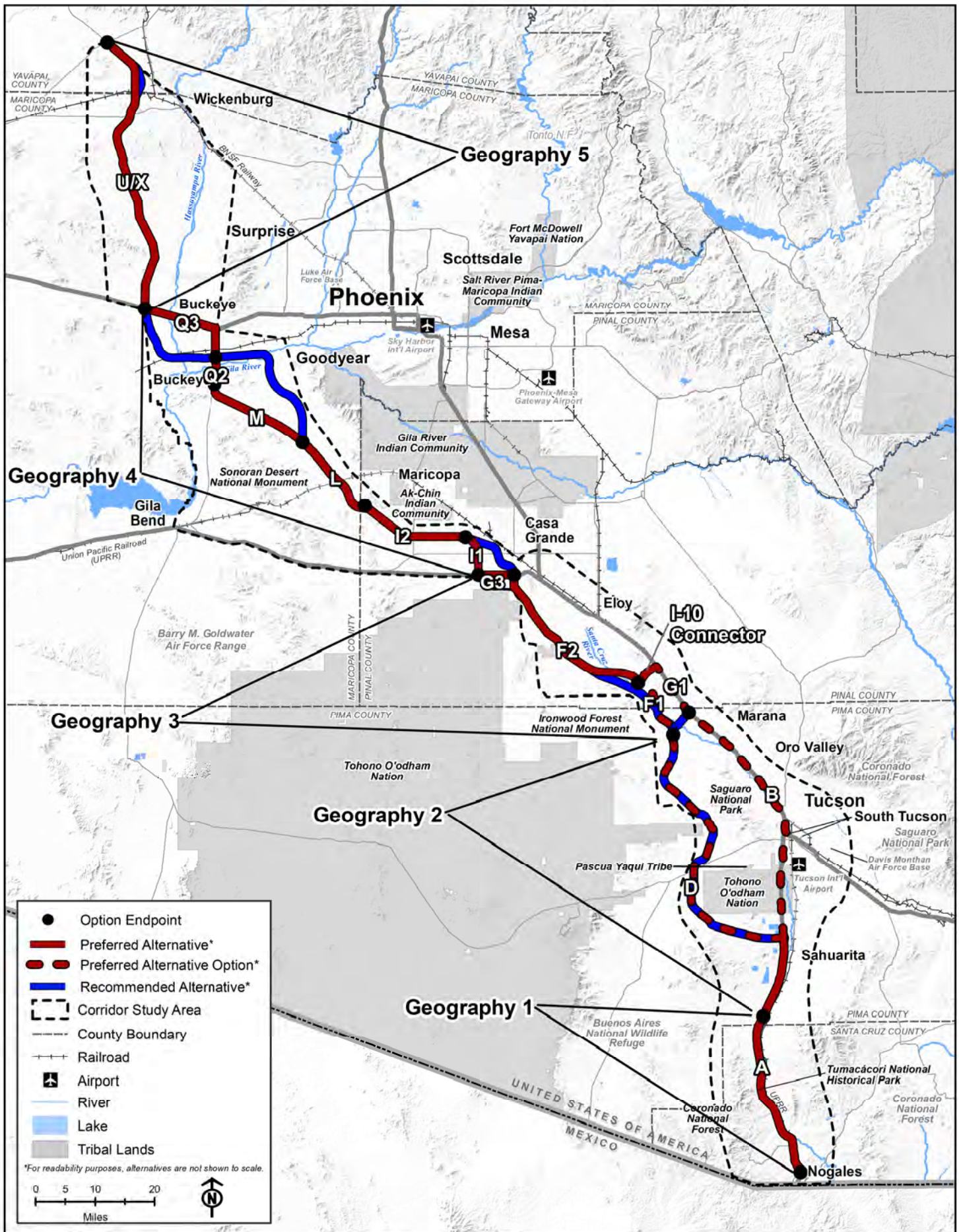


Figure 6-1. Draft Tier 1 EIS Recommended Alternative and Final Tier 1 EIS Preferred Alternative

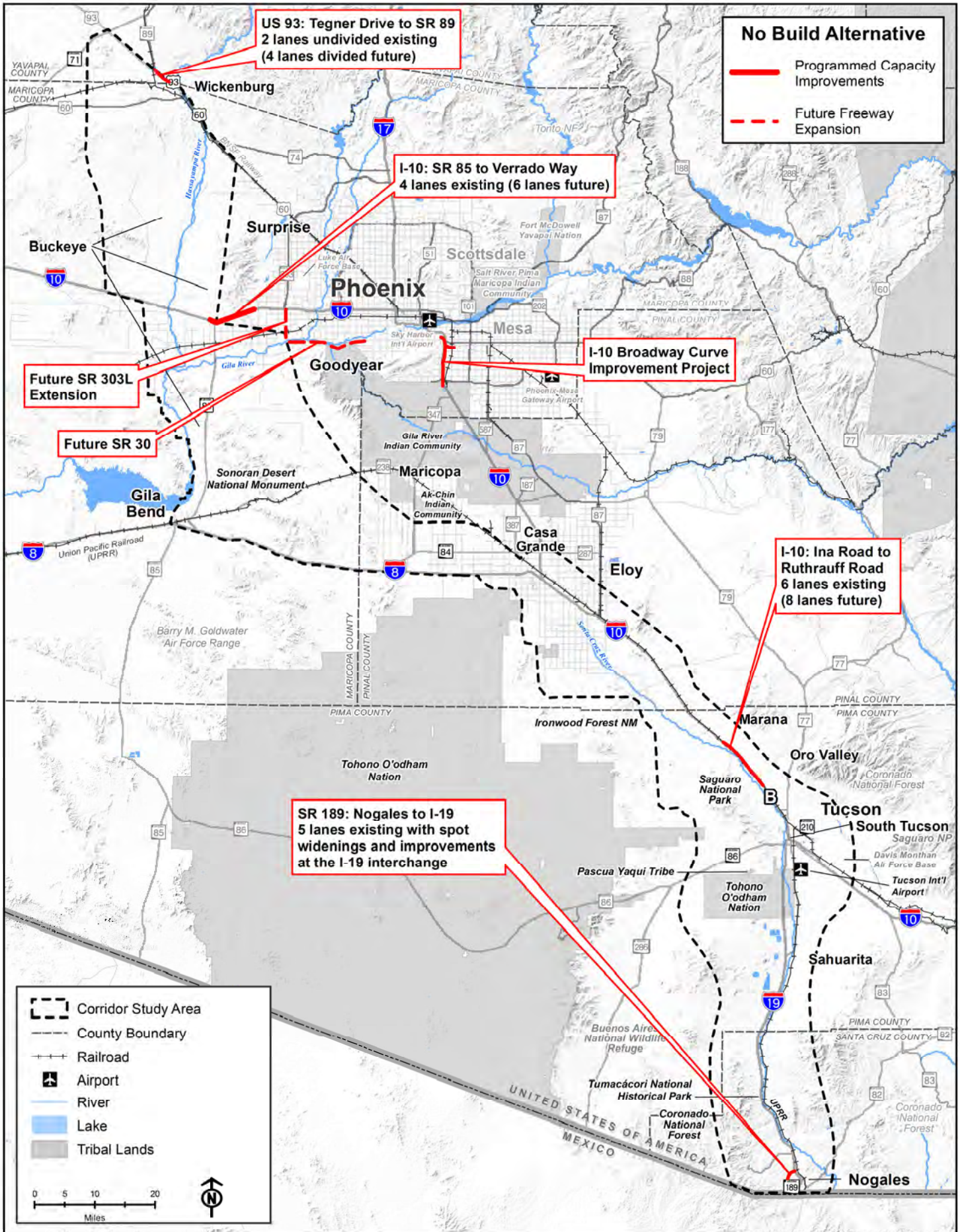


Figure 6-2. No Build Alternative Capacity Improvements



1 6.3 Input on the Recommended Alternative

2 This section summarizes major themes from public and agency comments on the
3 Recommended Alternative. General comments on the overall project are summarized first with
4 the following sections summarizing more location-specific comments. **Section 6.4** discusses
5 how those comments influenced the Preferred Alternative. Specific responses to comments are
6 in **Appendix H** (Comments on Draft Tier I EIS and Responses).

7 Several commenters expressed support for the No Build Alternative because the benefit or need
8 for the project did not outweigh impacts to wildlife, water resources, sensitive environments,
9 homes, ranches, farms, or cultural resources.

10 Some commenters suggested that ADOT finish improvements to I-10 before focusing on I-11.
11 Others opposed the project due to cost and suggested that ADOT instead spend the money on
12 maintaining existing roads. Commenters expressed support to widen existing highways rather
13 than build new ones or to implement tolls or raise gas taxes to avoid the need for new highways.
14 Commenters suggested the use of rail to move freight or intercity passenger traffic rather than a
15 highway. Some commenters did express support for the Project to reduce travel times in the
16 region or to improve freight flow. Others suggested that self-driving automobiles and trucks and
17 new traffic management technologies may change the transportation landscape to a point that a
18 new highway is not needed.

19 6.3.1 I-19: Nogales to Sahuarita

20 Comments on this area focused on the need for more lanes on I-19, using alternative routes
21 across tribal lands, or using ports of entry west of Nogales, such as those at Sasabe or
22 Sonoyta/Lukeville. This area is shown on **Figure 6-3**. Sample comments on the Nogales to
23 Sahuarita area include:

24 *I truly believe that the environmental impact study limits must include up to the south*
25 *border with Mexico. In other words, the Tier 1 EIS should include the section of Mariposa*
26 *Road (SR-189) from I-19 to Mariposa Port of Entry. Even though the Mariposa Road*
27 *Access Management Project expected to start construction by the end of 2019 or early*
28 *2020 included an environmental study, the future traffic expected with the development*
29 *of the I-11 corridor might have an impact to this segment that might require further*
30 *improvements (widening, i.e.). [City of Nogales]*

31 *...some policy changes at Nogales's Mariposa Port of Entry (Such as extending hours or*
32 *increasing staffing levels) would do a lot to help out with truck traffic up and down the*
33 *corridor. [member of the public]*

34 *I like the selected route of the I-19, but my recommendation is that we increase the lanes*
35 *from two lanes to three or possibly four lanes to move the traffic more efficiently.*
36 *[member of the public]*

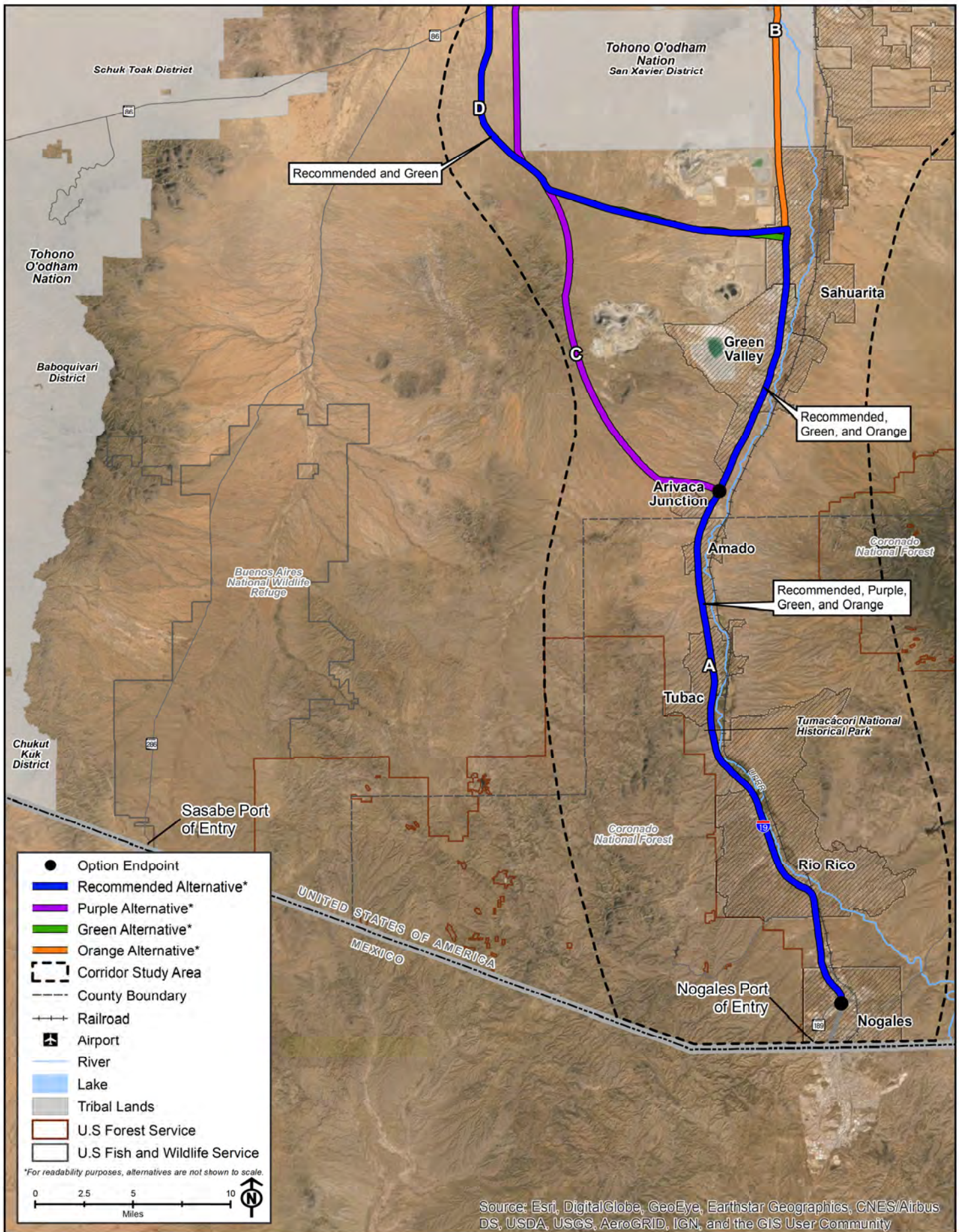


Figure 6-3. Nogales to Sahuarita with Recommended Alternative

1 **6.3.2 Sahuarita to Marana**

2 Comments expressed a preference for the southern connection with I-19 in Amado (the Purple
3 Alternative, which connects to I-19 in Amado) because it would avoid additional traffic through
4 Green Valley, avoid impacts in the growing community of Sahuarita, and provide an economic
5 benefit to the community of Amado (**Figure 6-3**). Topics brought up for the Sahuarita area
6 include a concern for community impacts, neighborhood continuity, and the rural, desert feel of
7 the community. This area is shown on **Figure 6-4**. Sample comments on the Sahuarita area
8 include:

9 *The proposed corridor doesn't work for those of us living in Sahuarita, Green Valley,*
10 *Tubac, Amado and Rio Rico. You need to move it west of the copper mines and Tinaja*
11 *Mts. or east of the Santa Rita Mtns. We do not need more congestion, more traffic, more*
12 *noise and anything else you will be bringing to the area. [member of the public]*

13 *I would be in favor of the I-11 interstate highway being built showing the purple*
14 *alternative near the town of Amado at the Arivaca junction, whatever they call it,*
15 *because I feel that building it in a more northerly location such as Sahuarita would be*
16 *highly disruptive to a growing, prosperous community, whereas the two roads would*
17 *meet, in my mind, down by Amado, it would greatly improve the local economy which is*
18 *almost zero right now, because you'll have a truck stop, motel, some kind of a*
19 *restaurant, you know. this always happens. And so I think it would be of great benefit to*
20 *those people down there. [member of the public]*

21 *Building I11 through or near our Rancho Buena Vista neighborhood [in Sahuarita] would*
22 *damage the balance of the natural desert ambiance with large one acre lots. The RBV*
23 *HOA CC&Rs are written to maintain a rural natural desert environment as well as the*
24 *wildlife corridor from the open desert to the Santa Cruz river. [member of the public]*
25

26 Many commenters focused on the Tucson and Avra Valley areas in Pima County. Some
27 commenters expressed opposition to the general concept of a new highway corridor. Others
28 acknowledged the lack of an alternate regional route and congestion issues on I-10, expressing
29 support for a new highway corridor. Many comments urged FHWA and ADOT to invest in
30 existing highways and explore more innovative solutions to the congestion problems on I-10
31 through Tucson, specifically suggesting double-decking I-10 or adding express lanes. There
32 was also concern that a bypass would negatively impact the economy in Tucson. Some
33 comments, both from the public and stakeholder agencies, requested further study before
34 choosing between the west option in Pima County and co-location with I-19 and I-10.

35 An overarching theme in Pima County was a deep concern for impacts to the natural
36 environment and sensitive resources in Avra Valley and a desire to have those areas remain
37 rural and undisturbed. Specific issues of concern include noise, visual, light pollution, wildlife
38 connectivity, wilderness areas, and impacts to the endangered Pima pineapple cactus.
39 Members of the public expressed how highly they value the desert environment, recreation
40 areas, and rural character of their community and said those features were the main reasons
41 they enjoy living in the area.

42

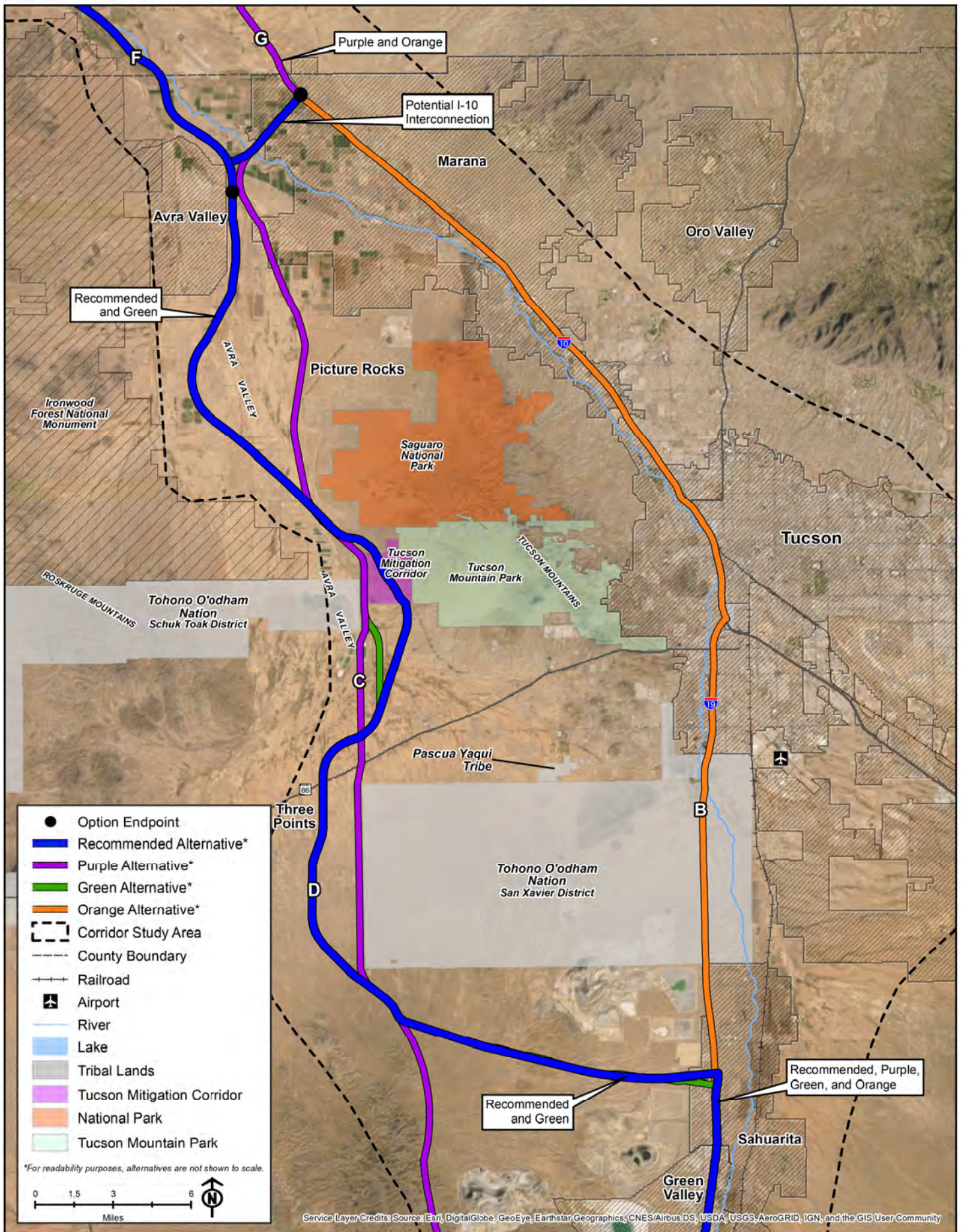


Figure 6-4. Sahuarita to Marana with Recommended Alternative

1 The Section 4(f) analysis was a focal point for comments from stakeholder agencies, with
2 numerous substantive comments requesting further analysis for the Tucson Mitigation Corridor,
3 Saguaro National Park, Ironwood Forest National Monument, and Tucson Mountain Wildlife
4 Area. Agencies were concerned the mitigation measures were insufficient to offset impacts to
5 the Tucson Mitigation Corridor and requested an individual Section 4(f) analysis of the property
6 be completed instead of the net benefit programmatic analysis presented in the Draft Tier 1 EIS.
7 More detail on Section 4(f) analysis can be found in **Chapter 4** (Draft Preliminary Section 4(f)
8 Evaluation).

9 In 2018, FHWA and ADOT invited the US Institute for Environmental Conflict Resolution to
10 facilitate a discussion in Pima County regarding the I-11 Tier 1 EIS. The US Institute is a
11 nationwide program of the Udall Foundation to assist parties in resolving environmental, public
12 lands, and natural resource conflicts that involve federal agencies or interests. Sample
13 comments from the process include:

14 *The proposed alignment that completely bypasses the Tucson economic corridor should*
15 *be abandoned. The economic impact to the corridor would be disastrous. Stack and*
16 *double up 1-10 and level out north of Marana where there is plenty of room to expand I-*
17 *10 width. Use the existing I-19 corridor as well. [member of the public]*

18 *I support the "green alternative" route which avoids the congested areas near Tucson*
19 *and Phoenix, which will only be worse if and when this I-11 route gets funded and built. It*
20 *is imperative that deviations from the existing I-19 and I-10 routes have as minimal as*
21 *possible impact on the areas they traverse. ADOT must work in conjunction with*
22 *environmental organizations, such as the "Coalition for Sonoran Desert Protection" to*
23 *insure that sufficient and approved wildlife corridors are built in appropriate locations*
24 *along new sections of any proposed route. [member of the public]*

25 *I would love to see AZ preserve some of its natural lands and not build the proposed I*
26 *11. However, if it is a necessity I would rather that less "new" road be added. Therefore,*
27 *building the orange proposal would be less invasive, less expensive and would not*
28 *invade as many established communities. Thank you. [member of the public]*

29 *Throughout the course of this process, a number of key themes emerged that will serve*
30 *to inform the Tier 1 EIS process. For example, it became clear that triple-decking I-10 is*
31 *not a palatable option for these stakeholders. Many expressed interest that the corridor*
32 *be built underground. Wildlife corridor crossing is an important consideration to many, as*
33 *is keeping viewsheds intact. Stakeholders hope that any new design will contain features*
34 *that reduce noise, light, and smell pollution. The largest con to many of the desired*
35 *design options is cost. In addition, stakeholders feel it is important to consider cultural*
36 *impacts and impacts to historical resources. Environmental justice is also important to*
37 *many, and impacts to minority and low-income neighborhoods should be taken into*
38 *account. Others feel that a silent majority of residents would prefer that the C/D route be*
39 *built, and that the needs and interests of everyone in Tucson valley (and southern*
40 *Arizona) should be taken into account, not just the needs and interests of residents of*
41 *Avra Valley. Public safety is important to keep in mind when selecting a new corridor,*
42 *and important to keep in mind when selecting design options for that corridor.*

43 *In terms of the overall process, most felt they were given ample opportunity to voice their*
44 *points of view. Feedback indicated that many were happy with the diversity of voices and*



1 *interests that were included in the process, though some felt that “minority” opinions (i.e.*
2 *business interests) were somewhat drowned out by others in the room. Others wished*
3 *they had more time to provide input, and expressed a feeling that the overall Tier 1 EIS*
4 *process is happening too fast. A majority expressed overall satisfaction with the process*
5 *and indicated that it was a good learning experience for all. Upon conclusion of the*
6 *meetings, attendees expressed interest in having the group continue to meet in the*
7 *future, and throughout the entirety of the overall Tier 1 EIS process. [Draft Tier 1 EIS*
8 *Appendix H, Summary of Lessons Learned section in Final Report: I-11 Stakeholder*
9 *Engagement, U.S. Institute for Environmental Conflict Resolution, May 2018]*

10 *After continued consultation with our TMC partners, the Department is requesting FHWA*
11 *prepare an Individual Section 4(f) Evaluation for the TMC. Based on discussions with*
12 *FHWA, it is our understanding that this change will not affect the overall EIS schedule.*
13 *[US Department of the Interior]*

14 *The Department continues to be concerned that the analysis at the Tier 1 level is*
15 *insufficient to determine a Recommended Alternative or a Preferred Alternative in the*
16 *Final EIS. The Recommended Alternative, which is 0.3 miles from SNP and 0.6 miles*
17 *from Wilderness, should include the necessary studies to illustrate and further quantify*
18 *the impacts the highway and cumulative effects of future multi-modal transportation and*
19 *reasonably foreseeable subsequent development would have to park resources and*
20 *visitors; specifically to wildlife movement and park wilderness values; impacting the view*
21 *shed, diminishing natural sounds; diminishing night sky darkness and increasing air*
22 *pollution. [US Department of the Interior]*

23 *Of all listed species that may be affected by the I-11 project, FWS is most concerned*
24 *about effects to the PPC. Unlike other listed species that occur in the I-11 study area—*
25 *which tend to occur in small numbers in restricted or relatively inaccessible habitats—the*
26 *PPC occurs in significant numbers within all three of the I-11 build corridor alternatives.*
27 *The recommended alignment for I-11 will bisect the PPC’s entire known range from*
28 *south to north and will affect possibly hundreds of individual cactus plants. The*
29 *proportion (percent) of the known range-wide population that will be affected is unknown*
30 *but is likely to be significant. [US Department of the Interior, US Fish and Wildlife*
31 *Service]*

32 *Selection of a corridor in the Tier 1 EIS deprives the decision maker and the public of*
33 *evaluating the true impacts of the proposed action and alternatives. Recommend*
34 *carrying multiple corridors forward to the Tier II NEPA analysis, particularly where the*
35 *environmental impacts are controversial or additional information would facilitate an*
36 *informed decision. [US Department of the Interior, Bureau of Reclamation]*
37

1 **6.3.3 Marana to Casa Grande**

2 Some commenters agreed there is a need for an alternate regional route in this area, while
3 others supported using the existing I-10 corridor. Commenters requested changes to the
4 Recommended Alternative, such as a closer examination of the interconnection with I-10, better
5 avoidance of the Santa Cruz River, or more distance from the rural community of Arizona City.
6 Many were concerned with impacts to the Santa Cruz River and the high-quality riparian habitat
7 and birding areas along its corridor. Concerns also included impacts to recreation areas, such
8 as Picacho Peak State Park, and cultural resources in and around the Ironwood Forest National
9 Monument. This area is shown on **Figure 6-5**. Sample comments on the Marana to Casa
10 Grande area include:

11 *On behalf of the City of Eloy, I would like to convey our support for the Green*
12 *Alternative...Our support for this alternative has been formalized through a resolution*
13 *adopted by the Eloy City Council on May 28, 2019. [City of Eloy]*

14 *While understanding that the scale of the previous documents likely did not account for*
15 *the Pinal Airpark and the alignment of the interconnection should be adjusted to avoid*
16 *the airpark, the Town of Marana strongly objects to the now depicted location of the*
17 *interconnection. [Town of Marana]*

18 *The Preferred Alternative is not environmental [sic] friendly as it impacts the important*
19 *birding areas found in the Santa Cruz Flats, along the Santa Cruz River and in Avra*
20 *Valley. Alternative Orange avoids these areas, preserves open space, and is less*
21 *disruptive. I suspect that it is also more cost efficient. [member of the public]*

22 *The Santa Cruz Flats are a priority area for the USACE. They contain high quality*
23 *wetlands. The USACE would prefer the corridor be shifted to the east, outside of the*
24 *floodplain in the general area of the Pinal Airpark. [US Army Corps of Engineers]*

25 *Regarding the Santa Cruz River crossing near Marana, the Recommended Alternative*
26 *alignment runs parallel to the Santa Cruz and will be both expensive and extremely*
27 *disruptive to the floodplain. Crossing the Santa Cruz River perpendicular to flow (purple*
28 *alternative) is the traditional design method for roadway crossing and would be far less*
29 *disruptive. [Pima County]*

30 *The region immediately north of the sand ridge is an affected area that includes the Oro*
31 *Blanco wash bottom and the margins of Ironwood Forest National Monument extending*
32 *northward to the Santa Cruz Flats. Development here would create a major barrier to*
33 *wildlife connectivity between Ironwood Forest (and "points west") and Picacho Peak*
34 *State Park, Picacho Mountains, and points north and east. The connectivity is essential*
35 *to the sustainability of native species. Similarly, we are concerned that much intact*
36 *Sonoran Desert Scrub will be severely impacted between the cutoff from I-19 west and*
37 *north into the southern Avra Valley. [Tucson Herpetological Society]*

38 *In order for the residents of Arizona City to continue to have a small intimate town you*
39 *must keep interstates out of the community. I10 and I8 are located approximately 3 miles*
40 *north of Arizona City, which has already created congestion and frustration with local*
41 *residents. The purple alternative route seems more appropriate for the Arizona City*
42 *community. [member of the public]*

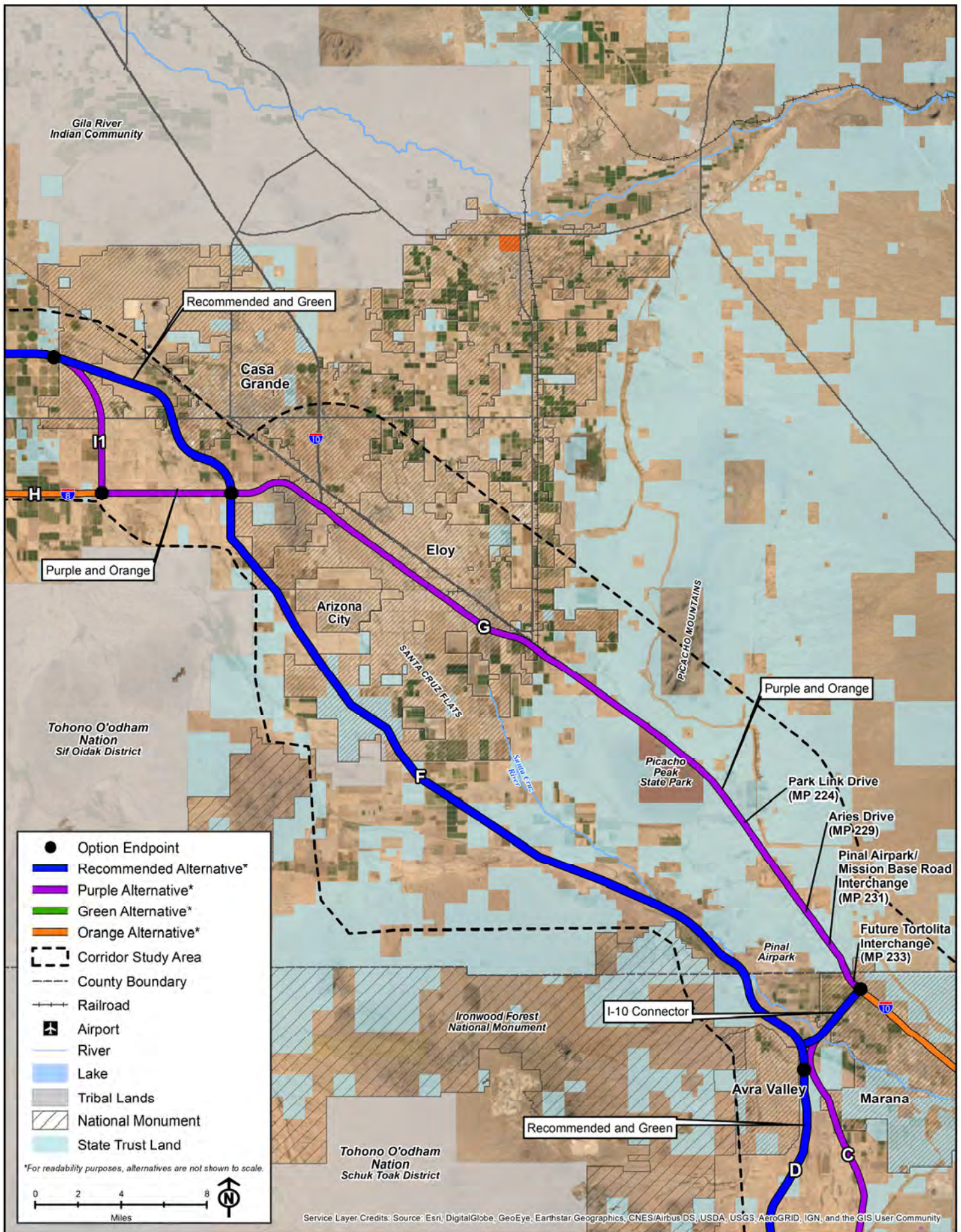


Figure 6-5. Marana to Casa Grande with Recommended Alternative

1 **6.3.4 Casa Grande to Buckeye**

2 Some commenters support using existing I-10 or I-8 (Orange Alternative) over building a new
3 highway, citing concerns with the construction and maintenance costs of a new highway,
4 environmental impacts, and light pollution. Others supported the Recommended Alternative
5 because it provides an alternate regional route, strengthens economic development and job
6 growth, promotes freight movement, and is generally consistent with plans for the West Pinal
7 and Hassayampa Freeways.

8 Comments from local agency stakeholders in the Casa Grande area were supportive of I-11 and
9 a new highway corridor, but they also stated they would support the Purple Alternative along
10 Montgomery Road over the Recommended Alternative, citing its consistency with local plans for
11 the West Pinal Freeway. Their comments further expressed concern for impacts to ongoing and
12 planned economic development and utilities west of Casa Grande along Option I2 in
13 unincorporated Pinal County. This area is shown on **Figure 6-6**.

14 Sample comments on the use of existing routes in the Casa Grande to Buckeye area include:

15 *Use of existing routes through State Highway 85 and Interstate 8 (Routes H, K, Q1) offer*
16 *transportation connectivity with substantially lower costs and significantly less impacts to*
17 *wildlife connectivity than new routes proposed in segments N, L, and I2. Those*
18 *segments, located north and east of Sonoran Desert National Monument are critical*
19 *wildlife corridors for many species that are challenging to adequately mitigate. [The*
20 *Nature Conservancy]*

21 *The orange alternative uses existing road that will become unsafe and continue to have*
22 *extreme congestion. The existing I-8, Highway 85/I-10 truck route is ineffective and is*
23 *currently avoided by the trucking industry. I prefer the green alternative. This is located*
24 *in areas of major population and future economic growth. This route is consistent with*
25 *Maricopa Association of Government, Hassayampa, Hidden Valley study for improving*
26 *transportation in western Pinal. It significantly reduces the time travel for trucking and*
27 *moving goods to spur economic development. By providing an alternative route near the*
28 *City of Maricopa, it will also reduce congestion on very unsafe State Route 347 and*
29 *improve travel in that area. In addition, I prefer a modification to the green alternative*
30 *that would be the Montgomery Road alignment to enter I-8 rather than the Chuichu Road*
31 *intersection. [member of the public]*

32
33 In the Goodyear, Buckeye, and Palo Verde area, concerns focused on impacts to Estrella
34 Mountain and CantaMia communities, the Gila River, and agricultural communities north of the
35 Gila River in Buckeye. USFWS expressed concern for potential impacts to the endangered
36 Yuma Ridgway's rail habitat and requested further evaluation of impacts to Public Land Order
37 1015 properties along the Gila River. USACE and other agencies expressed concern for
38 impacts to the Gila River. Other stakeholders supported the Recommended Alternative, citing
39 improved access and economic development opportunities.

40 East of SR 85 in Buckeye, Palo Verde, and Tonopah, there were similar concerns regarding
41 potential impacts to the Yuma Ridgway's rail habitat along the Gila and Hassayampa Rivers.
42 The City of Buckeye expressed concern that the Recommended Alternative is located too close
43 to schools and homes in Palo Verde and impacts dairy and other farms; they requested I-11 be
44 shifted south to be closer to the Gila River.

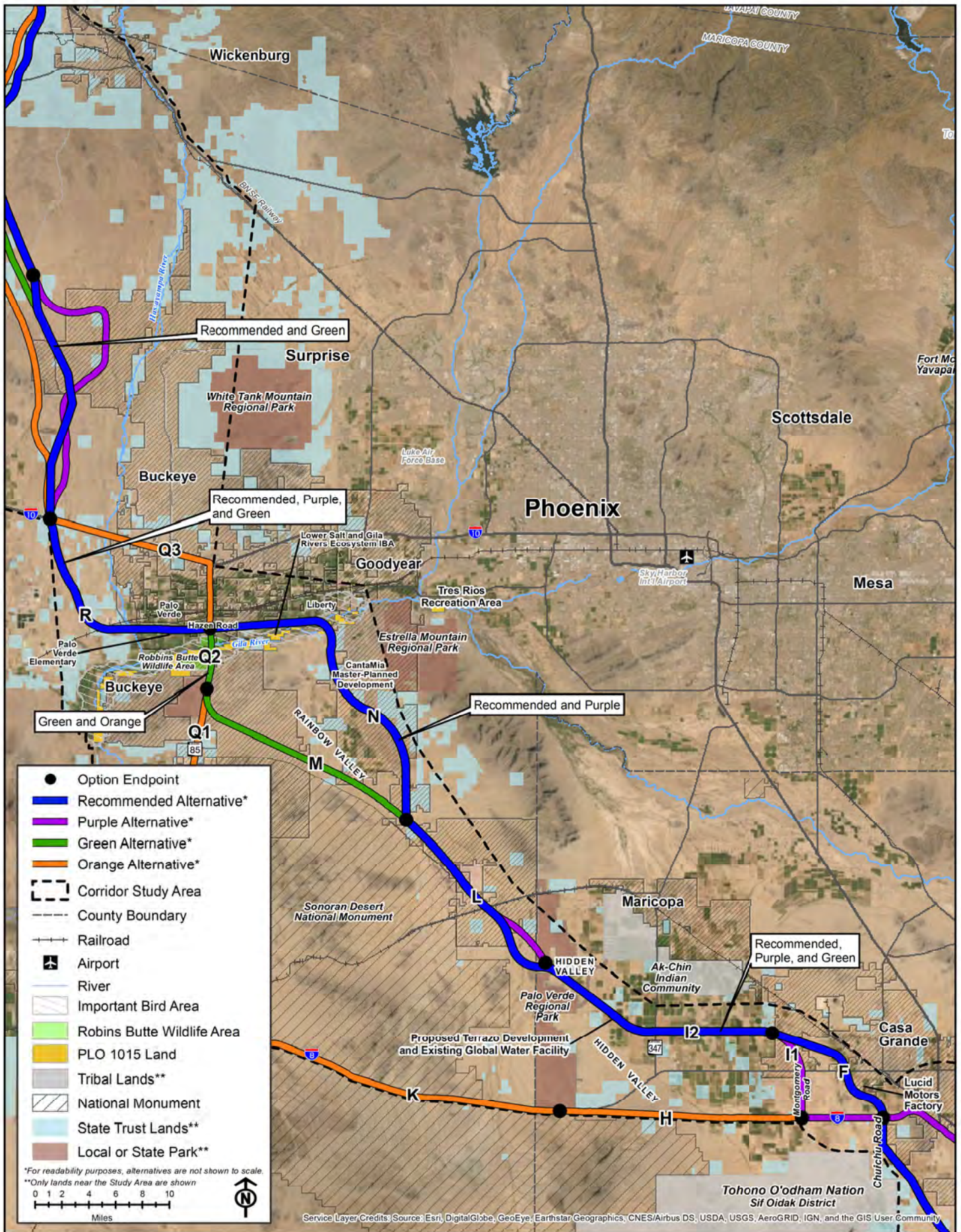


Figure 6-6. Casa Grande to Buckeye with Recommended Alternative



1 Sample comments on the northern portion of the Casa Grande to Buckeye region include:

2 *The recommended route (blue route) through Estrella Mountain would come extremely*
3 *close to our housing development. The alternate Green route appears to be a much*
4 *better route with regard to the Estrella Mountain communities. [member of the public]*

5 *As a resident of south Goodyear (south of the Gila River) I believe the value of having*
6 *convenient access in all directions as essential to future commerce for both residential*
7 *and commercial properties. [member of the public]*

8 *We do thank you for noting the six Important Bird Areas [IBA] that are within or*
9 *proximate to the study corridor for I-11, including the Lower Salt and Gila Riparian*
10 *Ecosystem IBA. This IBA is globally significant because of the population of Yuma*
11 *Ridgway's Rail, a federally endangered bird. This IBA has migratory and potential*
12 *breeding habitat for Southwestern Willow Flycatcher (Endangered) and Western Yellow-*
13 *billed Cuckoo (Threatened). The Yuma Ridgway's Rail was listed prior to critical habitat*
14 *designations. Table 3.14-4 showing only critical habitat affected gives an incomplete*
15 *picture of the impact of I-11 to Yuma Ridgway's Rail. The recommended corridor*
16 *alignment from Highway 85 east to the Gila River crossing on the Rainbow Valley Road*
17 *alignment includes or is immediately adjacent to known Yuma Ridgway's Rail detections.*
18 *This bird requires emergent marsh habitats and reliable water supply for those habitats.*
19 *Many of the suitable locations for this bird are in association with agricultural irrigation*
20 *return drains in the mapped floodplain for the Gila River. Audubon Arizona is developing*
21 *a GIS predictive model for potential suitable habitat for this bird. We hope to have a*
22 *completed map by this fall. We strongly recommend a more comprehensive analysis of*
23 *the impact the recommended corridor will have to Yuma Ridgway's Rail habitats.*
24 *[Audubon Arizona]*

25 *Particular attention should be given to the proposed crossing of the Gila River due to the*
26 *presence of a special aquatic site (wetland), which merits additional scrutiny under the*
27 *404(b)1 Guidelines [40 CFR 230.10(a)3]. [US Army Corps of Engineers]*

28 *Interstate 11 would cross the Gila River near the community of Liberty, about midway*
29 *between the Tres Rios Recreation Area and Robbins Butte Wildlife Area. There are*
30 *remarkable birding and wildlife populations downstream of the 91st Ave. water treatment*
31 *plant west to Tres Rios. Despite some urbanization, this Salt/Gila segment downstream*
32 *to Robbins Butte remains a flyway and corridor for wildlife, and should not be*
33 *unnecessarily interrupted by a busy freeway like I-11. [The Sierra Club]*

34 *Construction of a new bridge at the proposed crossing will impact the endangered Yuma*
35 *Ridgeway's rail (YRR) (*Rallus obsoletus yumanensis*), and possibly the threatened*
36 *western yellow-billed cuckoo (*Coccyzus americanus*) and endangered southwestern*
37 *willow flycatcher (*Empidonax traillii extimus*), due to habitat loss and elevated*
38 *disturbance levels. Of particular concern would be the permanent loss of irrigation runoff*
39 *that currently helps to recharge the Gila River and maintain marsh and riparian habitats*
40 *at the Option N crossing and along river reaches upstream and downstream of the*
41 *crossing. [US Fish and Wildlife Service]*

42 *I am opposed to the I-11 ADOT Recommended Alternative alignment for the following*
43 *reasons: It will be located very close (.5 miles) to Palo Verde Elementary School; It will*



1 | *cross the Buckeye Water Conservation & Drainage Districts main canal multiple times*
2 | *impacting irrigation delivery infrastructure; It impacts two (2) different dairy farm*
3 | *operations; It will be located within close proximity (less than ½ mile) to existing*
4 | *subdivisions; It bisects multiple existing farms into two separate areas causing major*
5 | *impacts to farming operations. [City of Buckeye, Buckeye Irrigation Company, and*
6 | *Buckeye Water Conservation and Drainage District]*

7 | **6.3.5 Buckeye to Wickenburg (Maricopa and Yavapai Counties)**

8 | Commenters expressed support for the Purple Alternative through the proposed Douglas Ranch
9 | development over the Recommended Alternative, citing concern that the Recommended
10 | Alternative is not consistent with local planning and would result in a need to revise planning
11 | documents, master plans, and development agreements. Their concern is that, by not directly
12 | reflecting local planning, the Recommended Alternative represents lost economic development
13 | opportunities.

14 | In the Vulture Mine RMZ, BLM restated their preference for the Orange Alternative, which is
15 | located outside of the Vulture Mine RMZ. BLM stated that if the I-11 corridor was planned
16 | through the Vulture Mine RMZ that it be routed through the multi-use corridor that already
17 | divides the Vulture Mine RMZ. They also expressed concern that the Recommended Alternative
18 | intersects an off-highway vehicle trail several times.

19 | Some commenters in the Wickenburg area were concerned that the Recommended Alternative
20 | is too far from the Town of Wickenburg and that this would negatively affect businesses in
21 | Wickenburg. Others were concerned the Recommended Alternative is located too close to
22 | residential communities. The Town of Wickenburg noted that north of US 60, they support
23 | moving the corridor west to minimize community impacts. Yavapai County supports the
24 | Recommended Alternative and requests that in Tier 2 the specific alignment be placed as far
25 | west within the 2,000-foot wide corridor as possible. This input reflects comments from local
26 | residents, who were concerned the Recommended Alternative is too close to the residential
27 | community of Vista Royale.

28 | AGFD expressed concern that the destruction and further isolation of tortoise habitat on the
29 | scale of the Recommended Alternative will lead to the species needing to be listed under the
30 | ESA in the future. Agencies also expressed concern for impacts to wildlife movement.

31 | This area is shown on **Figure 6-7**.

32 | Sample comments on the Buckeye to Wickenburg region include:

33 | *EPA continues to be concerned about the extensive indirect and cumulative impacts that*
34 | *are likely to result from construction of a future I-11 freeway, particularly as the*
35 | *recommended alternative directly fragments large intact habitat blocks in each of the*
36 | *project sections. This is of immediate concern within the northern section of the project*
37 | *area (Segment U) where extensive development has been proposed within the*
38 | *Hassayampa River floodplain, both impacting the hydrology of this important ecological*
39 | *resource, and limiting the potential for future habitat connectivity across a vital East-*
40 | *West wildlife movement corridor. [USEPA]*



1 The proposed routes would transect one of only two OHV race areas allocated in the
2 Hassayampa Field Office Resource Management Plan (RMP 2010) and travel through
3 the Vulture Mine Recreation Management Zone (RLIZ). The RAIP at Recreation
4 Resources (RR) 37 states "Motorized competitive speed races are authorized only 777
5 Special Recreation Management Zones (SRMAs) or Recreation Management Zones
6 (RMZs) where an allocation for such use has been made". The Hassayampa SRMA and
7 Castle Hot Springs RMZ (RMP at R 116 and RR 87, respectively) are the only two such
8 allocations. Therefore, the proposed route would potentially affect recreation that is
9 relatively rare on the field office and highly sought after by the OHV race community and
10 general public alike. There would also be potential effects to the Vulture Mine Recreation
11 and Public Purposes Act Lease (R&PP) recently entered into with Maricopa County
12 Parks Department which formalizes the development of motorized and non-motorized
13 recreation opportunities for the public over approximately 1000 acres adjacent to the
14 proposed route. [Department of the Interior, Bureau of Land Management]

15 Segment U of the recommended alternative which spans north through the Hassayampa
16 Plain and Tonopah Desert study area has the potential to affect wildlife movement over
17 two concrete wash overchutes and a wildlife bridge. While the primary intent of
18 overchutes is to maintain hydrological connectivity, wildlife use was considered in their
19 design. Reclamation has performed long-term monitoring of multiple CAP wildlife bridge
20 and concrete wash overchutes. Some overchutes currently being monitored have
21 recorded total individual crossings by mule deer as high as 380 a month. It is expected
22 that Segment U would devalue and reduce the wildlife utilization of the overchutes and
23 the wildlife bridge in the surrounding area. Replacement of multiple wildlife crossing
24 structures should be included as mitigation in Segment U. [Department of the Interior,
25 Bureau of Reclamation]

26 BLM directs you to its August 2018 comments on the ADEIS (included in Errata to
27 Appendix H section in Errata to Draft Tier 1 DEIS). These comments still generally apply,
28 particularly regarding BLM's preference for the orange alternative for the entire length of
29 the project and reasoning therefore. The orange alternative minimizes new disturbance
30 and collocates new facilities where possible, thereby minimizing impacts to BLM
31 designations and uses and sensitive resources throughout the project area. These
32 include:

33 -Avoids Vulture Mountain RMZ...[Department of the Interior, Bureau of Land
34 Management]

35 I live in the Wickenburg area and I oppose the I-11 going directly adjacent to the
36 neighborhood Vista Royal and connecting with the 93 at milepost marker 189. You have
37 8 miles of state trust land that you can move this to. This needs to be moved further west
38 at least two miles if not all the way to highway 71. Thank you. [member of the public]

39 The County asks that when final placement of the road is determined within the 2000'
40 preferred alignment corridor that consideration is taken to locate the road to the westerly
41 portion of the corridor, allowing more distance between the Vista Royale community and
42 the new interstate. [Yavapai County]

43

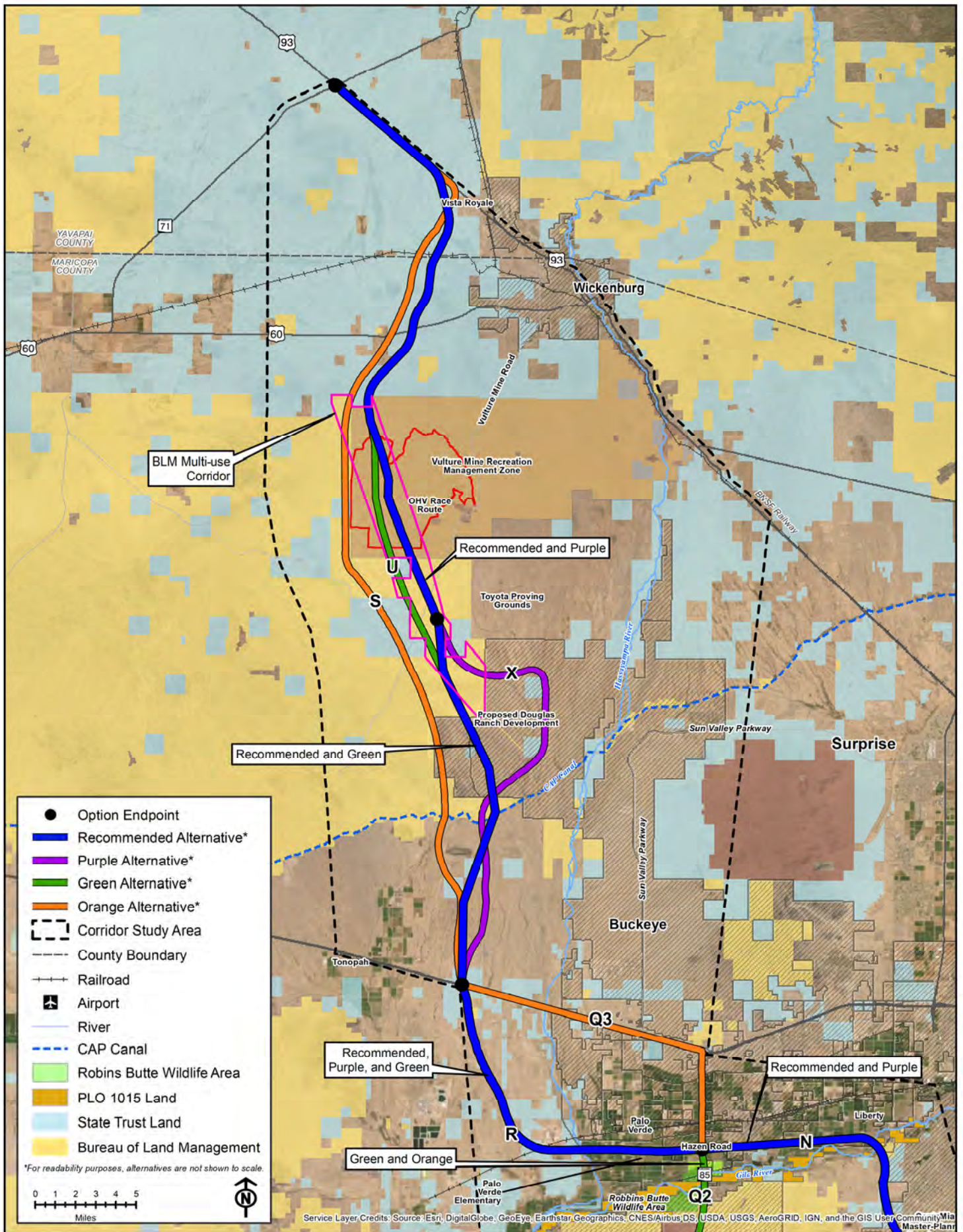


Figure 6-7. Buckeye to Wickenburg with Recommended Alternative



1 6.4 Rationale for the Preferred Alternative

2 The Final Tier 1 EIS documents the NEPA study completed to date, culminating in the
3 identification of the Preferred Alternative. This process included technical analysis, coordination
4 with study partners such as Cooperating Agencies, Participating Agencies, and Tribal
5 Governments, as well as the review and consideration of public input received at study
6 milestones.

7 The Project Team evaluated the comments received on the Recommended Alternative
8 presented in the Draft Tier 1 EIS. Based on this evaluation, FHWA and ADOT are proceeding
9 with a Preferred Alternative in this Final Tier 1 EIS that is different from the Recommended
10 Alternative in the Draft Tier 1 EIS. The Preferred Alternative balances transportation needs with
11 impacts to the natural and human environment and stakeholder input.

12 The No Build Alternative would not address the needs outlined in **Chapter 1** (Purpose and
13 Need). Travel times between Nogales and Wickenburg would not be improved and regional
14 mobility would not be improved for people or goods. FHWA and ADOT weighed the impacts of
15 the Recommended Alternative against the benefits described in the purpose and need metrics
16 and identified the Preferred Alternative to further reduce impacts while meeting purpose and
17 need. The Preferred Alternative would provide access to planned growth areas, improve travel
18 times between Nogales and Wickenburg, divert traffic from existing roadways, serve economic
19 centers, and provide an alternate regional route in many areas.

20 Self-driving automobiles and trucks and emerging traffic management technologies may change
21 the transportation landscape. ADOT uses the AZTDM to project traffic volumes, which does not
22 currently estimate these emerging technologies. If the need does decrease due to these
23 technologies, ADOT and regional planning organizations may choose not to prioritize the I-11
24 project. The funding process is discussed further in **Section 6.8**.

25 Economic growth in Arizona will result in demands on all modes of transportation, not just
26 interstate highways. This Tier 1 EIS considers a 2,000-foot-wide corridor, which is wide enough
27 for rail or utility lines if this infrastructure is implemented in the future.

28 The following discussion describes the rationale for the Preferred Alternative.

29 6.4.1 I-19: Nogales to Sahuarita

30 From Nogales to Sahuarita, the Preferred
31 Alternative is the same as the
32 Recommended Alternative. The
33 southernmost endpoint of the Project is at
34 the SR 189/I-19 interchange in Nogales.
35 The Preferred Alternative is co-located
36 with I-19 to the Santa Cruz/Pima County
37 line. ADOT travel demand modeling
38 indicates that I-19 will continue to provide
39 LOS C with projected 2040 traffic volumes;
40 however, Tier 2 studies would further investigate expanding I-19 based on new data and more

The Preferred Alternative uses I-19 between Nogales and Sahuarita, which is the same as the Recommended Alternative. It provides access to high-growth areas, achieves LOS C throughout the I-11 corridor, and serves key economic centers while avoiding impacts to sensitive environmental concerns.

1 specific regional travel demand models. If needed, there is potentially enough room for
2 additional travel lanes in the median (**Figure 6-8**).

3 Some commenters suggested using alternative routes across tribal lands. FHWA and ADOT did
4 not consider options on tribal lands because the Tohono O’odham Nation and Pascua Yaqui are
5 sovereign nations that did not grant FHWA and ADOT permission to study transportation
6 corridors on their lands. During scoping, the southern terminus of the project was confirmed as
7 the I-19/SR 189 interchange in Nogales, consistent with the proposed action, purpose and
8 need, and the *I-11 and Intermountain West Corridor Study* (NDOT and ADOT 2014).

9 **6.4.2 Sahuarita to Marana**

10 Based on technical analysis, and input
11 from agencies, tribes, and the public
12 leading into the Draft Tier 1 EIS, FHWA
13 and ADOT narrowed options in Pima
14 County to three: two western alternatives
15 (Purple and Green) and one eastern
16 alternative (Orange) through Pima
17 County. The Draft Tier 1 EIS
18 recommended the Green Alternative in
19 Pima County (**Figure 6-9**).

The Preferred Alternative carries forward both the west option and east option in Pima County, allowing ADOT to make a more informed decision after completing detailed environmental and engineering studies prior to selecting an alignment in Tier 2.

20 Feedback on the Draft Tier 1 EIS from both stakeholder agencies and the public requested
21 more detailed environmental studies and engineering in this area. FHWA and ADOT considered
22 these comments and modified the Preferred Alternative to carry forward both the west option
23 (Recommended or Green Alternative) and east option (Orange Alternative) in Pima County.
24 Carrying both a west and an east option forward allows ADOT to make a more informed
25 decision after completing detailed environmental and engineering studies in Tier 2. It also
26 enables metropolitan planning organizations, local governments, tribal nations, and other
27 planning organizations to continue long-term planning strategies while being responsive to
28 public and agency concerns.

29 Factors that influenced the determination to carry both a west and an east option forward with
30 the Preferred Alternative are described in the following sections.

31 **6.4.2.1 Section 4(f) and Tucson Mitigation Corridor Impacts**

32 The Preliminary Draft Section 4(f) Evaluation in the Draft Tier 1 EIS was one of the determining
33 factors considered when ADOT and FHWA identified the Recommended Alternative. The
34 evaluation found that the west option in Pima County would have a proposed net benefit to one
35 Section 4(f) property (the Tucson Mitigation Corridor), while the east option through Tucson
36 would result in unmitigable Section 4(f) impacts. The Section 4(f) evaluation was a topic of
37 concern for stakeholder agencies, particularly the Bureau of Reclamation, the official with
38 jurisdiction of the Tucson Mitigation Corridor. The Tucson Mitigation Corridor plays a critical role
39 in maintaining wildlife connectivity between the isolated habitat block along the Tucson
40 Mountains (Saguaro National Park and Tucson Mountain Park), Ironwood Forest National
41 Monument, and Roskrige Mountains.

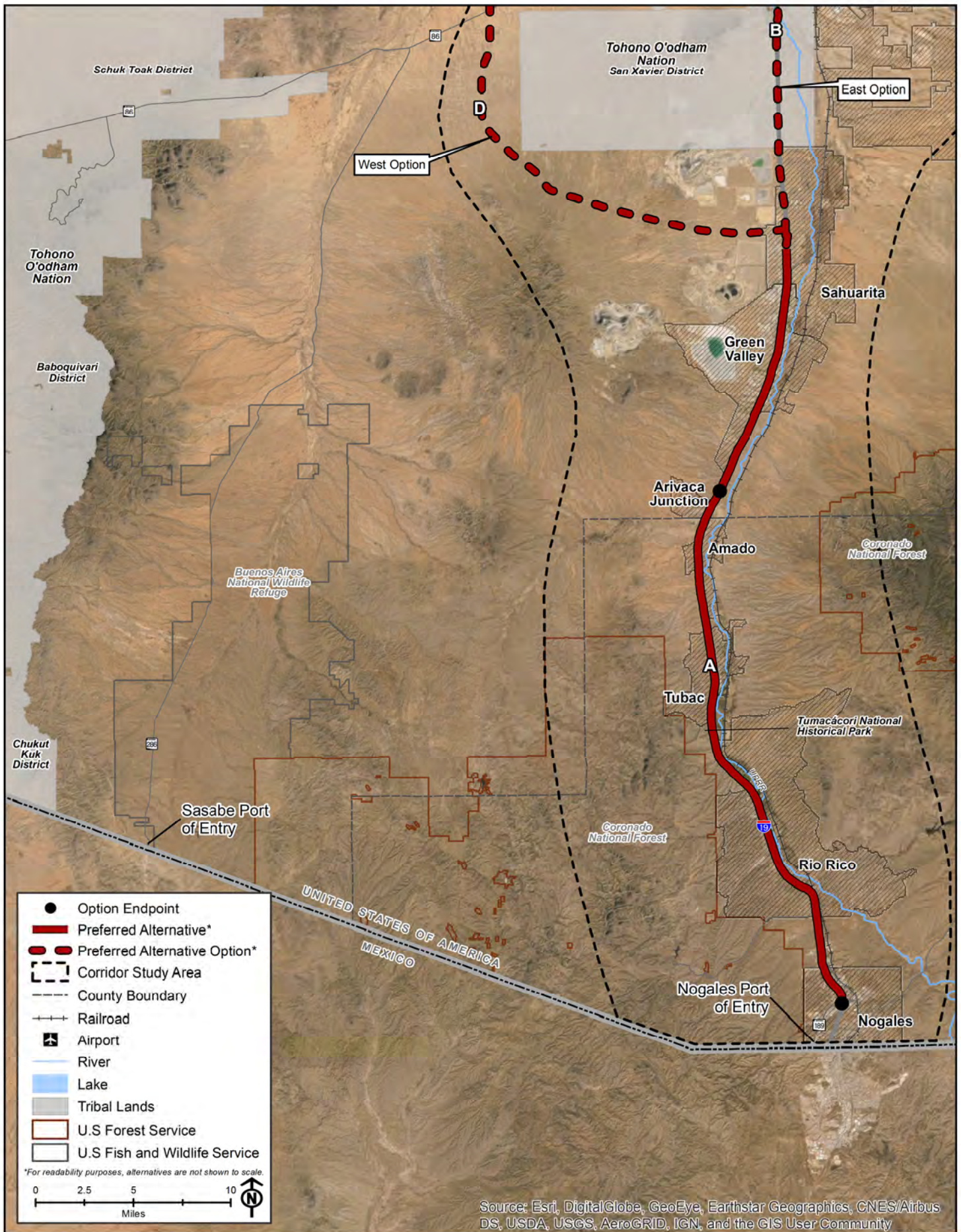


Figure 6-8. Nogales to Sahuarita with Preferred Alternative

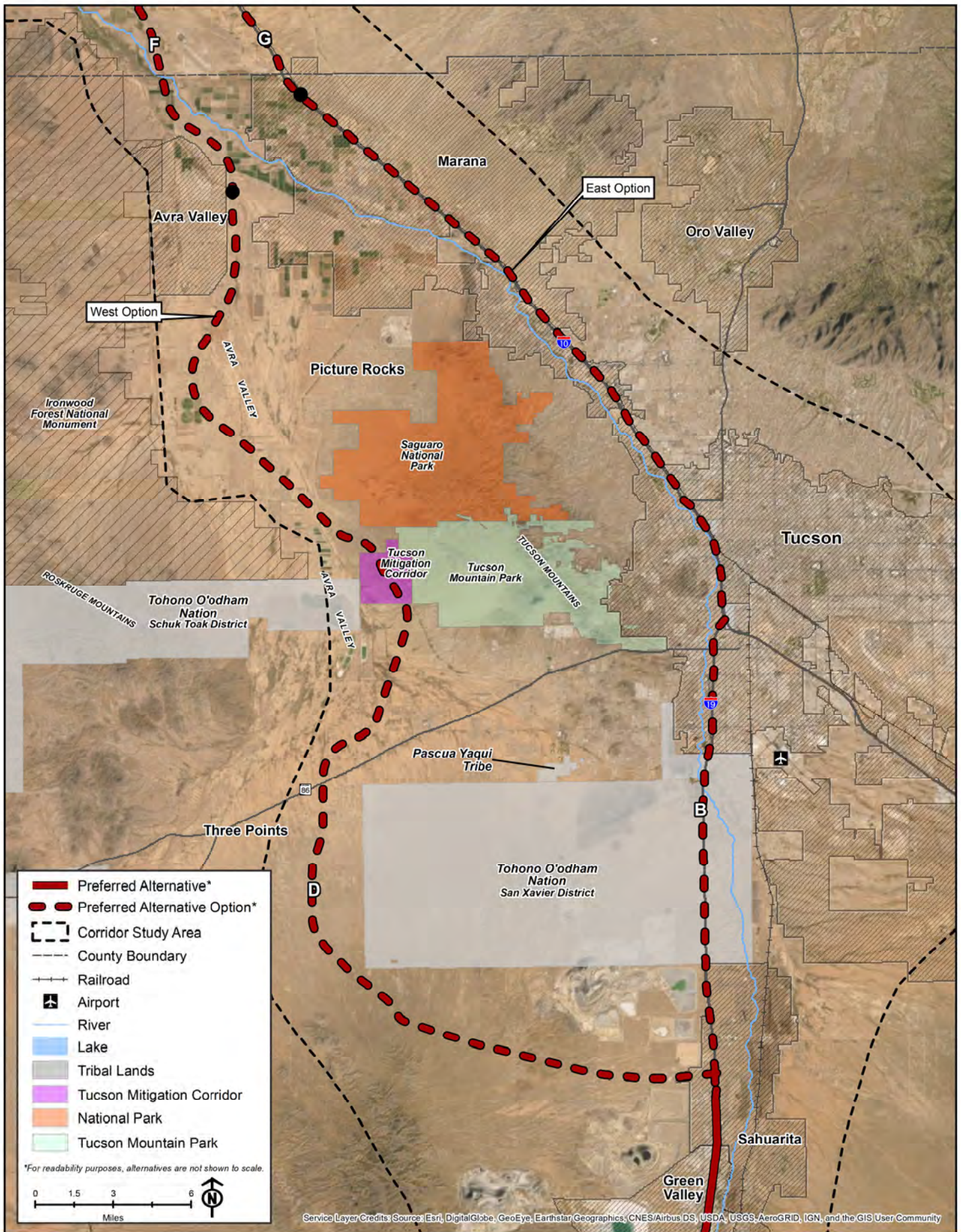


Figure 6-9. Sahuarita to Marana with Preferred Alternative



1 Coordination among FHWA, ADOT, and the Bureau of Reclamation leading up to the
2 identification of a Recommended Alternative indicated the Project, when combined with a
3 comprehensive package of mitigation strategies, had the potential to provide a net benefit to the
4 Tucson Mitigation Corridor and wildlife movements in Avra Valley compared to 2040 No Build
5 conditions. At the time, FHWA understood that the proposal would be subject to further
6 consultation with the officials with jurisdiction regarding potential use of the property. Feedback
7 from the Bureau of Reclamation on the Draft Tier 1 EIS stated they would not be able to provide
8 a higher level of commitment on their concurrence with the net benefit determination without
9 more detailed, quantitative impact analysis and a more specific mitigation package. The Bureau
10 of Reclamation's other Tucson Mitigation Corridor partners (USFWS, AGFD, and Pima County)
11 cited similar concerns regarding the need for more study in their comments on the Draft Tier 1
12 EIS. FHWA revised the Preliminary Individual Section 4(f) evaluation for the Final Tier 1 EIS; the
13 programmatic net benefit approach is no longer being pursued.

14 The Preferred Alternative with west option is located adjacent to the CAP canal to reduce the
15 barrier effect near the Tucson Mitigation Corridor (a 2,514-acre property that the Bureau of
16 Reclamation preserved for wildlife connectivity). The concept of co-locating I-11 near the CAP
17 canal was referred to as the CAP Design Option in the Draft Tier 1 EIS. The CAP Design Option
18 assumed at-grade travel lanes and would remove and reclaim Sandario Road (further reducing
19 the barrier effect) and co-align existing wildlife crossings over the CAP canal with new wildlife
20 crossings over I-11. All the Build Alternatives that come near the Tucson Mitigation Corridor use
21 the CAP Design Option (including Purple, Green, Recommended, and Preferred with west
22 option). Tier 2 studies may evaluate a tunnel or elevated structure in addition to an at-grade
23 highway.

24 **6.4.2.2 Additional Differentiating Analysis**

25 Agencies and the public expressed concern with traffic, noise, and air quality impacts to the
26 Saguaro National Park and other sensitive resources in Avra Valley. While the qualitative air
27 quality analysis found similar regional air quality impacts between the west and east options in
28 Pima County, agencies requested detailed quantitative analysis of local impacts covering
29 additional topics, such as decreased visibility. These types of quantitative project-level analyses
30 require detailed design information and traffic data (such as roadway profile or specific
31 interchange locations) that have not been developed for the Tier 1 EIS. Because no decision is
32 being made between the west and east options in Pima County, additional analysis
33 differentiating between these options will be conducted in Tier 2.

34 **6.4.2.3 Cultural Resources Survey and Analysis**

35 There was also a concern that comparing potential cultural resource impacts of the east and
36 west options in Pima County doesn't give enough consideration to the fact that most of the area
37 along the west option is unsurveyed and could contain undiscovered cultural resources. The
38 Tier 1 EIS analysis used information collected from Section 106 consulting parties and prior
39 studies to estimate the type and number of cultural resources that might be affected, applying a
40 model to rate areas based on their potential for unrecorded archaeological sites and historic
41 structures in both surveyed and unsurveyed areas. While this is an appropriate level of detail for
42 a Tier 1 EIS and the rankings developed provide a good understanding of how the Build
43 Corridor Alternatives perform relative to each other, the areas rated as having potential
44 moderate or even low levels of impacts (such as the west option in Pima County) could still
45 result in a Section 106 finding of an adverse effect.



1 **6.4.2.4 Section 4(f) Impacts in Downtown Tucson**

2 The Preliminary Section 4(f) evaluation in the Draft Tier 1 EIS found the Orange Alternative
3 would impact Section 4(f) properties in downtown Tucson. A number of scenarios for
4 improvement to I-10 were considered, including alignment shifts, an elevated structure, and a
5 tunnel. For a stretch of 6.5 miles, downtown Tucson is densely developed with parks, historic
6 districts, historic structures, and businesses very close to the existing I-10 right-of-way. Shifting
7 the alignment was considered problematic because it would impact homes, parks, businesses,
8 and historic properties on one or both sides of the highway. An elevated structure (i.e., double
9 decker or viaduct) would require deep excavations in an area known to contain underground
10 archaeological sites, and SHPO advised the noise and visual impacts of such improvements
11 would result in an adverse effect to the historic buildings, districts, and structures. A tunnel
12 would encounter similar concerns with archaeological sites and have an extraordinary cost
13 (\$3.5 to \$5.4 billion).

14 Tier 2 studies may evaluate elevated structures, tunnels, or elimination of frontage roads to
15 minimize impacts in Tucson and these concepts are accounted for in the total project cost
16 estimates in **Table 6-5**. The impact assessment in **Chapter 3** (Affected Environment and
17 Environmental Consequences) assumes widening at grade through Tucson because this would
18 represent the largest footprint. Elevated structures and tunneling are discussed in detail in
19 **Chapter 4** (Draft Preliminary Section 4(f) Evaluation).

20 The estimate of tunneling costs assumes two tunnels would be bored under I-10,
21 accommodating two additional I-11 travel lanes in each direction with existing I-10 remaining in
22 place. Some stakeholder and public comments indicate it would be desirable to put the entire
23 highway corridor (both the existing I-10 and proposed I-11) in an underground tunnel; this would
24 require further study during Tier 2.

25 A common theme in feedback from both stakeholder agencies and the public on the Draft Tier 1
26 EIS was a request that ADOT explore a wider and more creative range of scenarios to co-locate
27 I-11 with I-10. Members of the public specifically stated they would be open to an elevated
28 structure. The City of Tucson suggested the frontage roads be eliminated, and that space be
29 used to provide more highway capacity. Based on a preliminary inventory of parcels
30 immediately abutting the frontage roads between the I-19/I-10 system interchange and Prince
31 Road, there are over 50 (both residence and businesses) whose only access is via the frontage
32 road. There are an additional 40 parcels with access from both the frontage road and a local
33 road. Three recreation resources (David G. Herrera and Ramon Quiroz Park, the Santa Cruz
34 River Park, and the existing and proposed El Paso and Southwestern Greenway trail) rely on
35 the frontage roads for access to parking lots or for maintenance. Several neighborhoods also
36 connect to the frontage road via local roads, and eliminating the frontage road would require
37 reconfiguring ingress and egress.

38 **6.4.2.5 Town of Sahuarita**

39 Carrying both a west and an east option forward allows ADOT to make a more informed
40 decision after further studying concerns brought forward by the Town of Sahuarita, including
41 impacts to residences.



1 **6.4.3 Marana to Casa Grande**

2 From Marana to Casa Grande, the
3 Preferred Alternative is a new corridor and
4 is similar to the Recommended
5 Alternative, incorporating a shift that
6 minimizes impacts to the Santa Cruz
7 River and a new location for the
8 interconnection to I-10 (**Figure 6-10**).

9 **6.4.3.1 Santa Cruz Floodplain**

10 After review of public and agency
11 comments voicing concern for impacts to
12 the Santa Cruz River and coordination
13 with USACE, FHWA and ADOT shifted a
14 12-mile section of the Recommended
15 Alternative (Option F) to minimize impacts
16 to the Santa Cruz floodplain and
17 associated braided channels, riparian
18 habitat, and wetlands in Pinal County, as
19 shown on **Figure 6-10**. The Preferred
20 Alternative with west option, as shown in
21 **Table 6-1**, would impact fewer waters of
22 the US than the Recommended

23 Alternative. While the Preferred Alternative with east option would also impact waters of the US,
24 those impacts would entail widening of existing river and wash crossings.

25 The Project Team explored ways to avoid and minimize impacts to the Santa Cruz river
26 floodplain in response to USACE concerns with impacts to the riparian area and high-quality
27 wetlands. Mountainous terrain and the Ironwood Forest National Monument restrict alternatives
28 west of the river. The Project Team evaluated a shift to the east and determined that the shift
29 would not increase other impacts.

The Preferred Alternative uses Option F, which is the same as the Recommended Alternative with a minor refinement. FHWA and ADOT shifted a 12-mile section of the Recommended Alternative (Option F) to minimize impacts to the Santa Cruz floodplain in response to USACE comments and relocated the connector to I-10 to respond to the Town of Marana concerns. The Preferred Alternative provides an alternate regional route to alleviate congestion and prevent bottlenecks during emergency situations where there currently is no alternative route to I-10. It serves planned growth areas and key economic centers in Marana, Eloy, and Casa Grande and is consistent with local and county-level planning. It will attract and divert traffic from existing roadways and is part of the end-to-end alternative that will reduce travel time between Nogales and Wickenburg compared to the No Build Alternative.

30 **Table 6-1. Miles of Waters of the US in the 2,000-foot-wide Corridors of the**
31 **Recommended and Preferred Alternatives**

Potential Waters of the US	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Santa Cruz River	3.1	2.5	6.7 ^a

32 SOURCE: USGS 2019. [See **Table 3.13-5** for more detail.]

33 Note: All numbers in table are rounded to the nearest 0.1 mile.

34 ^a The Preferred Alternative with east option is co-located with I-10; any impacts to waters along this option would entail widening of
35 existing river and wash crossings.

36

37

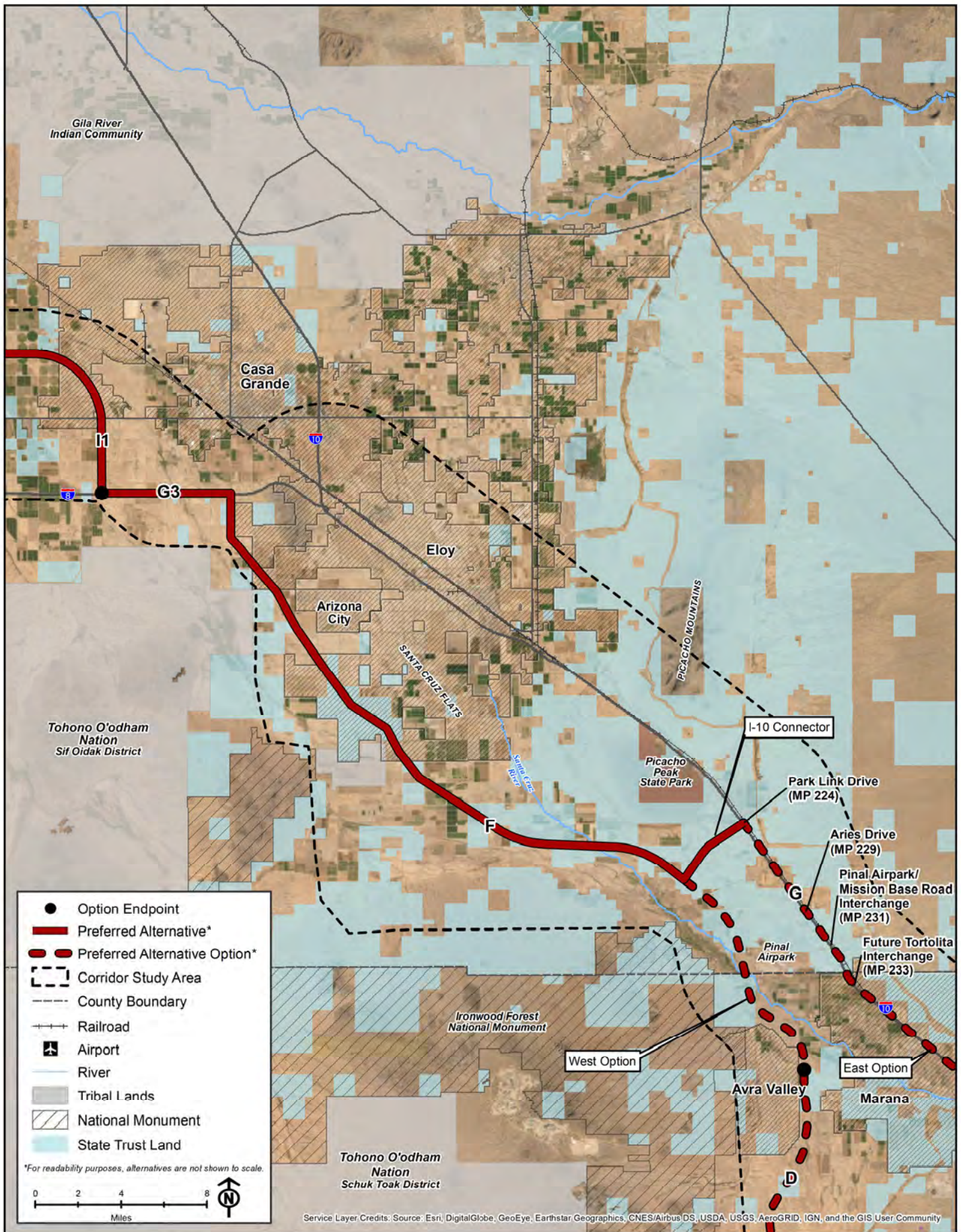


Figure 6-10. Marana to Casa Grande with Preferred Alternative



1 **6.4.3.2 Alternate Regional Route for Incident Management**

2 I-10 is a transcontinental corridor, and it is the only high-capacity transportation connection
3 between Arizona's two largest population centers—Phoenix and Tucson. This high-volume
4 highway frequently experiences crashes and other incidents, such as weather events, that delay
5 travel. Events that cause highway closures generally happen at random and with very little or no
6 warning. In the event of a full highway closure, mobility delays are not only inconvenient, they
7 present safety hazards for first responders and can have economic impacts to the trucking and
8 freight industry.

9 The Orange Alternative (Option G) would use the existing I-10 corridor, which has enough
10 capacity for projected future traffic volumes with I-11. However, Option G would not supply the
11 alternate route that Option F would in an area where incidents and closures often occur and
12 where the transportation network off the interstate is limited.

13 **6.4.3.3 Planned Growth Areas**

14 The Preferred Alternative (Option F) would provide access to planned growth areas in Marana,
15 Eloy, and Casa Grande. It extends through areas that are vacant or agricultural today but that
16 contain planned growth areas around Marana and Eloy. The development of a new high-
17 capacity transportation facility connecting these growth areas is consistent with local and
18 county-level planning. The land use around the Preferred Alternative in this area is generally
19 undeveloped and agricultural. Impacts to these resources would be minimized and mitigated
20 through Tier 2 design considerations, such as conveyance structures for floodwaters, wildlife
21 connectivity, and habitat impacts.

22 **6.4.3.4 Connector to I-10**

23 The Town of Marana expressed concern that the location of the I-10 connector intersected with
24 I-10 at the same location as the planned Tortolita Boulevard interchange (milepost [MP] 233 on
25 I-10). They predict high local traffic volumes for the interchange as planned residential
26 developments are built, and cited concerns that planning one interchange to serve as both a
27 system interchange (where traffic is moving between I-10 and I-11) and service interchange
28 (where local traffic gets on and off a freeway) would be problematic. The Town of Marana
29 suggested the planned I-11/I-10 service interchange be located farther north on I-10. The
30 Project Team explored three alternative locations for the I-11/I-10 connection:

- 31 • **Pinal Airpark/Mission Base Road (MP 231).** This option was eliminated because it would
32 either require a circuitous route for the connecting highway or go through the Pinal Airpark,
33 a cemetery, and wastewater reclamation facility. This connection point was suggested by
34 the Town of Marana.
- 35 • **Aries Drive (MP 229).** This option would be located entirely on undeveloped State Trust
36 land, would impact no known cultural resources, and would be approximately 1 mile from
37 the Pinal Airpark runway.
- 38 • **Park Link Drive (MP 224).** This option would be located entirely on undeveloped State
39 Trust land, would impact no known cultural resources, and would be approximately
40 4.75 miles from the Pinal Airpark runway. An interchange at Park Link Drive could connect
41 to SR 79, a major arterial road east of I-10.



1 Both the shift to avoid the Santa Cruz River and the new I-10 connector at Park Link Drive bring
2 the Preferred Alternative closer to Pinal Airpark and extend through State Trust land. During
3 coordination, ASLD said they do not have concerns with the floodplain shift and new I-10
4 connector. Coordination with stakeholders that use the Pinal Airpark facility identified no
5 concerns that would affect continued operation of Arizona Army National Guard operations at
6 the Airpark. While other stakeholders stated the Recommended Alternative (with or without the
7 proposed changes) would hinder continued use of the area for parachute training operations,
8 they also acknowledged proposed growth and development in the area would likely impact
9 parachute operations prior to implementation of the I-11 corridor.

10 Based on the above evaluation, FHWA and ADOT are proceeding with the Park Link Drive
11 (MP 224) connection point. This location is responsive to the Town of Marana concerns and
12 avoids co-location with the proposed Tortolita interchange, provides connectivity to SR 79 to the
13 east, and is farther away from the Pinal Airpark than the Recommended Alternative and other
14 locations considered.

15 **6.4.3.5 Impacts to Residences Near Arizona City**

16 Individuals from Arizona City cited concerns with noise, light, and air quality and suggested that
17 the Recommended Alternative be moved west, farther from the residential areas in Arizona City.
18 Shifting the alignment west is constrained by the Tohono O'odham Nation, and would bring the
19 corridor closer to the Santa Cruz River and its tributaries. It would also result in out of direction
20 travel and longer travel times. Therefore, FHWA and ADOT did not refine the Recommended
21 Alternative near Arizona City.

22 **6.4.4 Casa Grande to Buckeye**

23 Between Casa Grande and southern
24 Buckeye, the Preferred Alternative is a
25 new corridor on a new alignment. It
26 connects to SR 85 south of Buckeye and
27 is co-located with SR 85 and I-10 in
28 western Maricopa County (**Figure 6-11**).

29 **6.4.4.1 I-8 Crossing**

30 The Preferred Alternative differs from the
31 Recommended Alternative in the Casa
32 Grande area, and follows Montgomery
33 Road rather than Chuichu Road north of
34 I-8. The Recommended Alternative would
35 have required one system interchange at
36 Chuichu Road approximately 4 miles west
37 of the existing I-8/I-10 system
38 interchange.

The Preferred Alternative differs from the Recommended Alternative in the Casa Grande area, and follows Montgomery Road (Option I2) rather than Chuichu Road north of I-8.

Through the Hidden Valley area, the Preferred Alternative remains the same as the Recommended Alternative (Options I2 and L).

The Preferred Alternative is different from the Recommended Alternative through Buckeye and Palo Verde. It includes Options M, Q2, and Q3 rather than Options N and R, which avoids a new crossing of the Gila and Hassayampa Rivers.

The Preferred Alternative is consistent with local plans and agency feedback and minimizes impacts to the rivers and desert tortoise habitat.

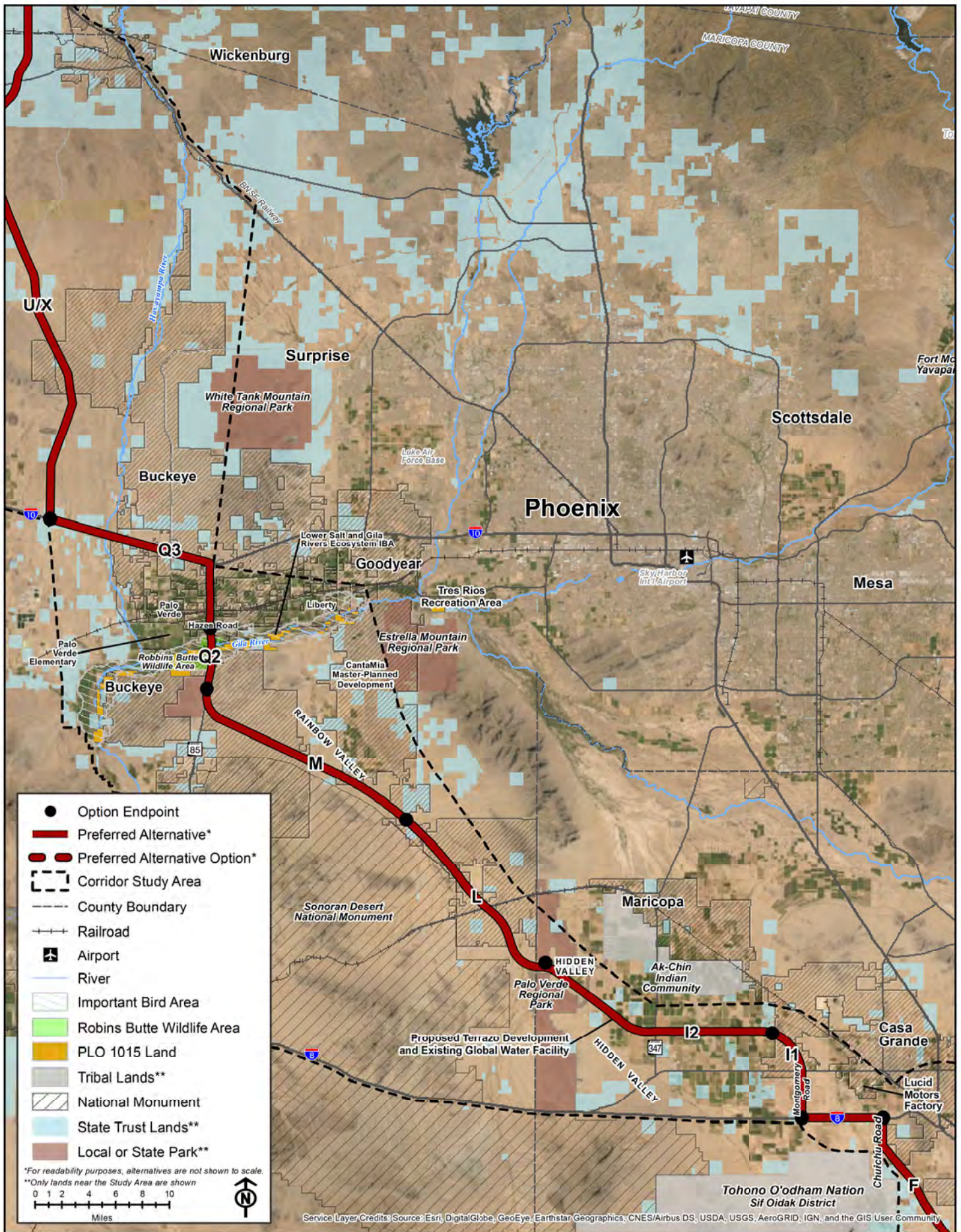


Figure 6-11. Casa Grande to Buckeye with Preferred Alternative



1 Local agencies and organizations including CAG, Pinal County Board of Supervisors, the City of
2 Maricopa, SCMPO, and the Pinal County I-11 Coalition expressed support for an alignment that
3 intersects I-8 at Montgomery Road because they have planned around a high-capacity
4 transportation facility at that location, as evidenced by the West Pinal Freeway in the *Pinal*
5 *Regional Transportation Plan* (Pinal County Regional Transportation Authority 2017). The
6 Recommended Alternative is located in an economic development corridor with several ongoing
7 and planned large-scale developments.

8 Although the Preferred Alternative would require two system interchanges on I-8 (one at
9 Montgomery Road and one where Option F intersects I-8), FHWA and ADOT are proceeding
10 with this alternative because it is consistent with adopted plans and local agency feedback.

11 **6.4.4.2 Maricopa Area**

12 Through the Maricopa area, the Preferred Alternative remains the same as the Recommended
13 Alternative. Agency and public comments requested consideration of the proposed Terrazo
14 master-planned development and associated Global Water facility, which lie within the 2,000-
15 foot-wide corridor of the Recommended Alternative. The corridor is consistent with the location
16 of the West Pinal Freeway in the *Pinal Regional Transportation Plan* through the Hidden Valley
17 area (Pinal County Regional Transportation Authority 2017), although the location of the West
18 Pinal Freeway in the City of Maricopa *2040 Vision Strategic Plan (General Plan)* shows a
19 slightly different location that avoids the Terrazo development (City of Maricopa 2015). The
20 planned Terrazo development has zoning entitlements but has not been officially platted and no
21 building permits have been issued. The Global Water facility provides water, wastewater, and
22 recycled water utility service to the City of Maricopa. While it would be possible to avoid the
23 Global Water facility when placing the specific alignment within the corridor during Tier 2
24 studies, the property on which Terrazo would be located is not avoidable. The Project Team
25 evaluated shifting the corridor south to avoid the proposed footprint of the Terrazo development,
26 and found it would result in more impacts to high-quality Sonoran Desert habitat.

27 Due to the trade-off in impacts, the Recommended Alternative's consistency with the 2017 *Pinal*
28 *Regional Transportation Plan*, and the ability to avoid the Global Water facility within the
29 Preferred Alternative corridor, the Preferred Alternative through Hidden Valley area is the same
30 as the Recommended Alternative.

31 **6.4.4.3 Goodyear, Buckeye, and Palo Verde Area**

32 After review of public and agency comments and obtaining new information regarding the
33 potential loss of irrigation runoff important to maintain habitat for the endangered Yuma
34 Ridgway's rail, FHWA and ADOT revised the Recommended Alternative (Options N and R) in
35 this area. The Preferred Alternative in the Final Tier 1 EIS includes Options M, Q2, and Q3
36 instead of Options N and R. The Preferred Alternative is partially co-located with SR 85 and
37 I-10, eliminating the need for new crossings of the Gila River and Hassayampa River, thereby
38 minimizing impacts to riparian and critical habitat and federally protected species in the area.

39 The Draft Tier 1 EIS identified two alternatives to consider for crossing the Gila River: the
40 Recommended Alternative (a new highway corridor) and the Orange Alternative (co-located with
41 SR 85 and I-10). Tier 2 studies would determine whether the existing crossing under the Orange
42 Alternative would be expanded or rebuilt. Citing the presence of wetlands along the Gila River,
43 USACE suggested particular attention be paid to the Recommended Alternative creating a new

1 crossing of the Gila River and consideration for its potential to be determined the least
2 environmentally damaging practicable alternative.

3 The Recommended Alternative creates new crossings of the Gila and Hassayampa Rivers in
4 areas where there are high-quality wetlands, riparian areas, and threatened and endangered
5 species and habitat. USFWS commented that a new crossing of the Gila River could impact
6 designated critical habitat for the yellow-billed cuckoo and habitat for the southwestern willow
7 flycatcher and Yuma Ridgway's rail. USFWS cited concerns that this area is important recovery
8 habitat and the Recommended Alternative could cause permanent loss of irrigation runoff that
9 sustains habitat, potentially affecting the southwestern willow flycatcher, yellow-billed cuckoo,
10 and Yuma Ridgway's rail. The combined impacts of the new river crossing and the potential loss
11 of agricultural runoff could result in greater habitat impacts than estimated in the Draft Tier 1
12 EIS.

13 In comparison, the Orange Alternative would co-locate with existing crossings of the Gila and
14 Hassayampa Rivers. While the Orange Alternative crosses both rivers, it does in locations
15 where there is already an existing crossing and would likely result in fewer new impacts due to
16 the presence of the existing highways.

17 The Preferred Alternative would avoid creating a new highway corridor through the Gila/Salt
18 River Corridor Granite Reef Dam potential linkage zone, and instead cross this linkage on a co-
19 located SR 85. The Preferred Alternative would also impact the Buckeye Hills-East Sonoran
20 Desert National Monument wildlife linkage (along Option M), which the Recommended
21 Alternative did not intersect. The Gila River linkage is a high value corridor and is home to a
22 greater number of species than the Buckeye Hills linkage, including threatened and endangered
23 species. While the Preferred Alternative would still impact wildlife connectivity, the shift to co-
24 locating with SR 85 and minimization of impacts to the Gila River linkage represent an overall
25 reduction in wildlife connectivity impacts.

26 While the change in corridor alignment results in a slight increase in travel time, the Preferred
27 Alternative balances travel times with overall impacts.

28 **6.4.5 Buckeye to Wickenburg (Maricopa and Yavapai Counties)**

29 Between Buckeye and Wickenburg, the Preferred Alternative is a new corridor on a new
30 alignment. It incorporates a shift to tie into US 93 farther away from the Vista Royale
31 neighborhood (**Figure 6-12**). The planned I-11/I-10 System Interchange at 363rd Avenue is the
32 same as the Recommended Alternative. The location of the I-10/I-11 system interchange at
33 363rd Avenue (MP 100.5 on I-10) was identified early in the design process. The *Interstate 10 –*
34 *Hassayampa Valley Roadway Framework Study* identified traffic interchanges and system
35 interchanges on I-10 in western Maricopa County (MAG 2007). The locations of three system
36 interchanges were proposed at the future Hassayampa Freeway (MP 100.5), SR 85 (MP 112.8),
37 and SR 303L (MP 124.7), providing at least 6 miles of clearance between them for ramping,
38 safe weaving, and maximum flexibility in design. Since that time, the system interchanges for
39 SR 85 and SR 303L have been built. In order to maintain the proper distance and spacing
40 between system interchanges, the connection point of I-11 on I-10 at 363rd Avenue (MP 100.5)
41 was incorporated into all Build Corridor Alternatives for the Tier 1 EIS.

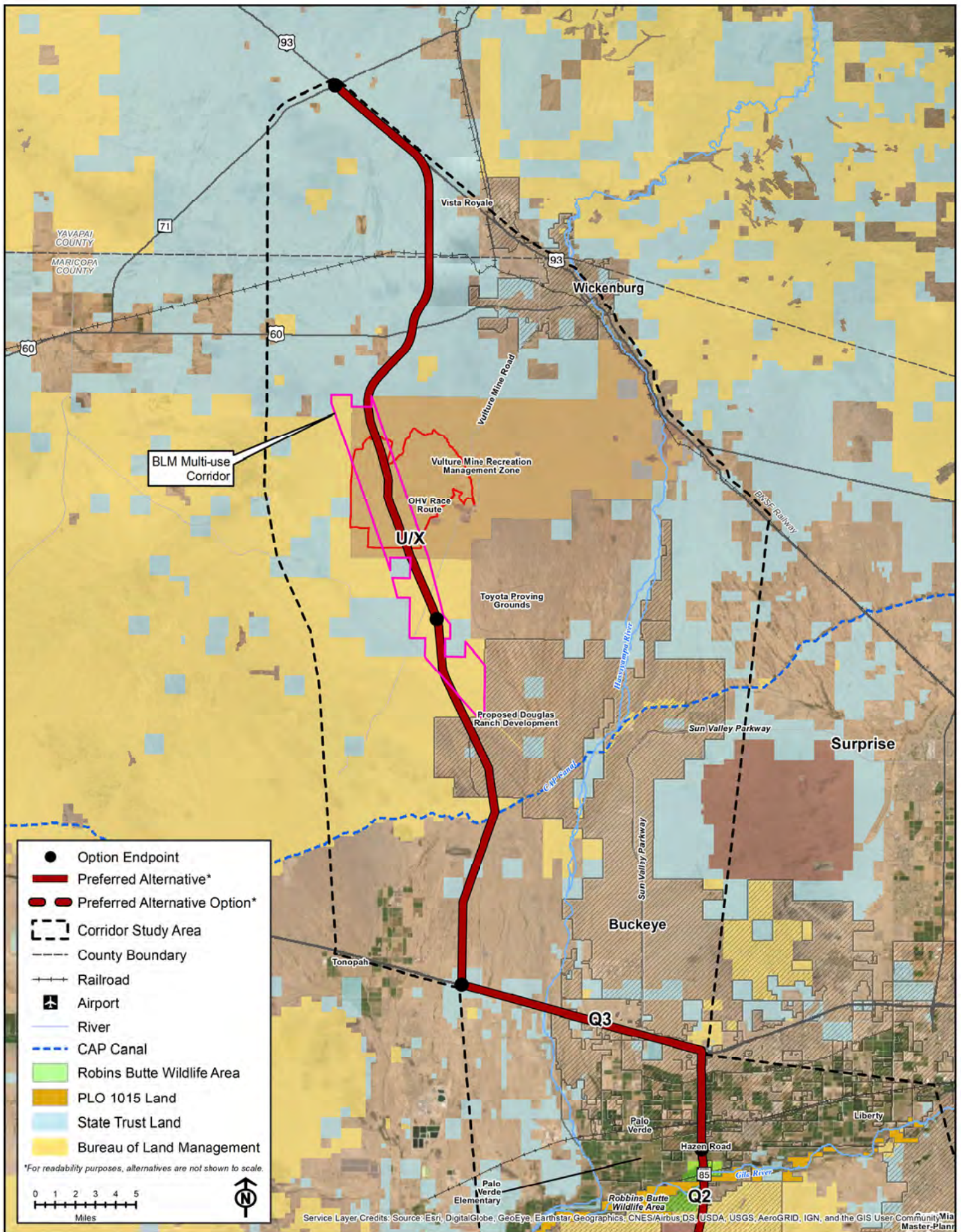


Figure 6-12. Buckeye to Wickenburg with Preferred Alternative



1 **6.4.5.1 Western Maricopa County Area**

2 The Preferred Alternative is the same as the Recommended Alternative (Option U) in western
3 Maricopa County. The Preferred Alternative is generally consistent with planning efforts
4 originating in the mid-2000s that call for a high-capacity facility through the Hassayampa Valley
5 (referred to as the Hassayampa Freeway). However, the I-11 Preferred Alternative does not
6 follow the exact alignment in local plans, instead following a straighter and more direct route.

7 The Purple Alternative is most similar to what is shown in previous local planning documents,
8 which show a highway alignment through the center of the planned Douglas Ranch
9 development and was desired to provide both connectivity and economic development
10 opportunities for the planned development. North of Douglas Ranch, however, constraints within
11 the Vulture Mine RMZ push the corridor farther west than was originally planned, resulting in an
12 out-of-direction loop through the planned Douglas Ranch development. Previous planning
13 documents follow the alignment of Vulture Mine Road, which was eliminated early in the Tier 1
14 EIS planning process based on agency feedback. Instead, the Preferred Alternative follows the
15 alignment of power lines through a multi-use corridor within the Vulture Mine RMZ, 4 to 5 miles
16 west of Vulture Mine Road. Additionally, the Purple Alternative is closer to the Hassayampa
17 River floodplain and riparian habitat and would require more tributary crossings. The Preferred
18 Alternative intersects the western portion of the planned Douglas Ranch development and does
19 not preclude development of a separate facility, such as a parkway, that bisects the
20 development as shown in local plans.

21 Through the Vulture Mine RMZ, the Preferred Alternative is the same alignment as the
22 Recommended Alternative, and is located within a BLM multi-use corridor and closely follows
23 the same alignment as the power transmission lines. This alignment is located 5.9 miles west of
24 Vulture Mine Road, within a BLM multi-use corridor identified through joint planning efforts with
25 BLM. Although some past local planning efforts and commenters on the Draft Tier 1 EIS support
26 locating the new highway on Vulture Mine Road, FHWA and ADOT eliminated the Vulture Mine
27 Road alternative during the alternatives screening process due to concerns it infringes on
28 environmentally sensitive areas and conflicts with planned recreation areas. BLM stated a
29 preference for alternatives either outside of the Vulture Mine RMZ or within the designated
30 multi-use corridor. The Vulture Mine RMZ is a Section 4(f) property; however, FHWA
31 determined that Section 4(f) does not apply to the multi-use corridor because the purpose of the
32 multi-use corridor is to co-locate utilities and transportation infrastructure. Corridor alternatives
33 located within the multi-use corridor avoid Section 4(f) impacts.

34 **6.4.5.2 Wickenburg Area**

35 While the location of the Recommended
36 Alternative was consistent with previous
37 feedback from the Town of Wickenburg
38 and input from the public gathered during a
39 context sensitive corridor design process
40 led by the Town of Wickenburg, feedback
41 gathered during Draft Tier 1 EIS public
42 review shows the locals' desired location
43 for I-11 changed (Town of Wickenburg
44 2017). In response to these comments, the Project Team evaluated alignment shifts to minimize
45 impacts to residential areas without increasing impacts to other resources. FHWA and ADOT

The Preferred Alternative carries forward the Recommended Alternative (Option U and X), with a refinement to Option X near US 93 to minimize impacts to residences near Wickenburg. This alignment minimizes impacts to residences, floodplains, wildlife linkages, and Sonoran Desert tortoise habitat.

1 determined that shifting I-11 (Option X) to a location approximately 1 mile away from the homes
2 in the Vista Royale neighborhood would reduce impacts to those residents while following
3 natural terrain, and reducing impacts to floodplains, wildlife linkages, and Sonoran Desert
4 tortoise habitat.

5 **6.5 Comparison of End-to-End Recommended and Preferred** 6 **Alternatives**

7 As previously described, FHWA and ADOT identified a Preferred Alternative that is different
8 from the Recommended Alternative. Changes were based on feedback on the Draft Tier 1 EIS
9 and the additional technical analyses documented in **Chapter 3** (Affected Environment and
10 Environmental Consequences) of the Final Tier 1 EIS. As shown on **Figure 6-1**, it follows more
11 existing highways than the Recommended Alternative, and includes segments co-located with
12 I-19, I-8, SR 85, I-10, and US 93. It also includes many of the new corridor segments from the
13 Recommended Alternative while incorporating several refinements to avoid and minimize
14 potential impacts. It carries forward two options for further study in Pima County.

15 **6.5.1 Summary of Alignment Differences between the Recommended and** 16 **Preferred Alternatives**

17 The Preferred Alternative is different than the Recommended Alternative in the following areas,
18 as shown on **Figure 6-1**:

- 19 • The Preferred Alternative carries forward both the west option in Pima County
20 (Recommended or Green Alternative) and the east option in Pima County (Orange
21 Alternative), allowing ADOT to make a more informed decision after completing detailed
22 environmental and engineering studies in Tier 2.
- 23 • The Preferred Alternative connects to I-10 at Park Link Drive north of Marana rather than
24 Tortolita Boulevard, which is responsive to feedback from the Town of Marana.
- 25 • The Preferred Alternative incorporates a refinement in southern Pinal County to minimize
26 impacts to the Santa Cruz River, in response to comments from USACE.
- 27 • The Preferred Alternative follows Montgomery Road north of I-8, which is consistent with
28 adopted plans and local agency feedback.
- 29 • The Preferred Alternative uses SR 85 and I-10 in the Buckeye area, eliminating new
30 crossings of the Gila River and Hassayampa River and minimizing impacts to critical riparian
31 habitat and federally protected species.
- 32 • The Preferred Alternative was shifted slightly west near US 93 in Yavapai County to
33 minimize impacts to residences, floodplains, wildlife linkages, and Sonoran Desert tortoise
34 habitat.

35 **Figure 6-13** shows the Preferred Alternative. **Table 6-2** compares the Recommended
36 Alternative and Preferred Alternative major geometric characteristics.

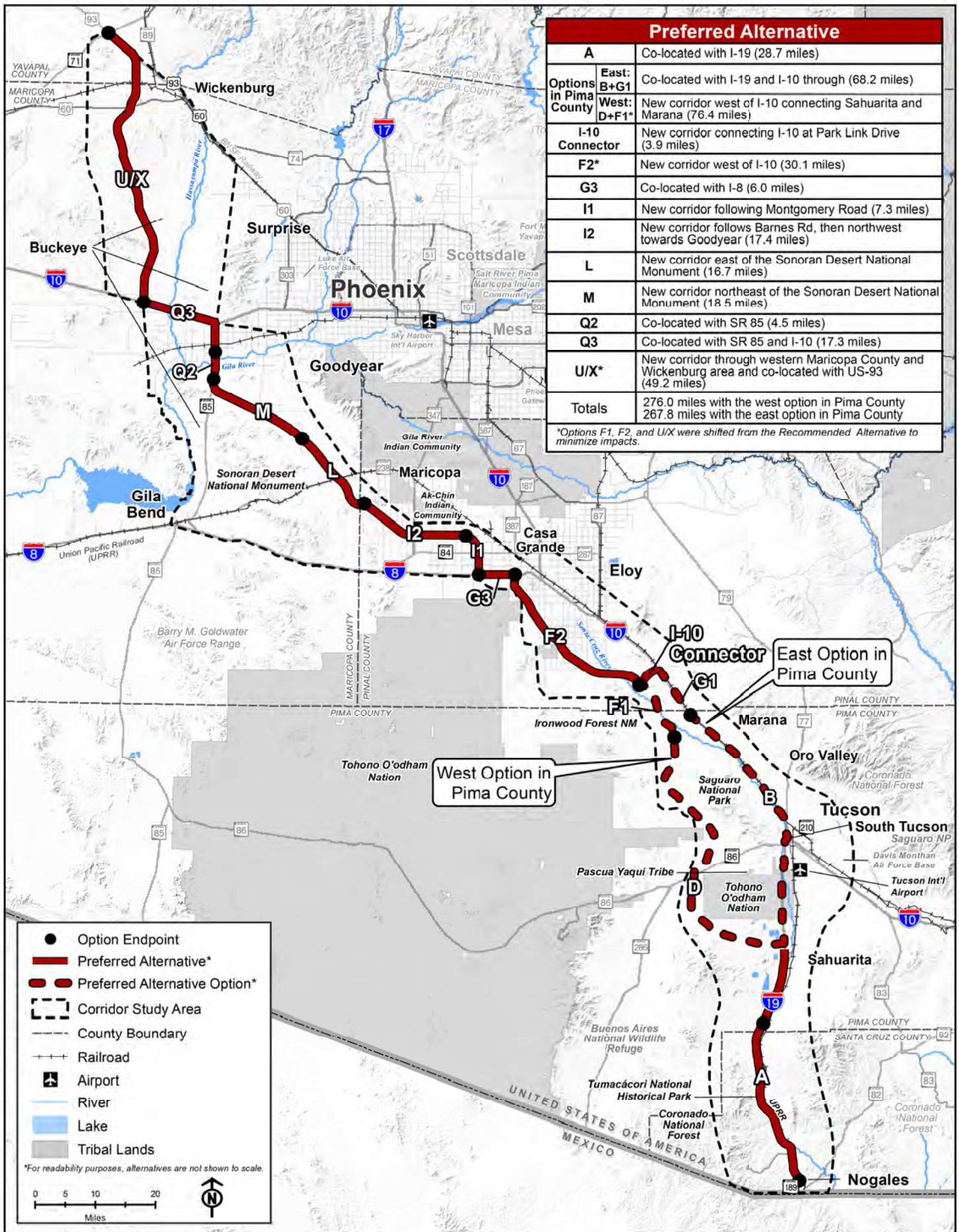


Figure 6-13. Preferred Alternative



1 **Table 6-2. Characteristics of the Recommended and Preferred Alternatives**

Characteristic	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Total Length (miles)	276.1	276.0	267.8
New Lane Miles	917	864	714

2 **6.5.2 Purpose and Need Comparison**

3 The Recommended and Preferred Alternative were evaluated using the same six purpose and
 4 need metrics first presented in the Draft Tier 1 EIS to determine how effectively they address
 5 the transportation needs in the Study Area. The results of this evaluation are summarized in
 6 **Table 6-3.**

7 **Table 6-3. Considerations in Meeting the I-11 Purpose and Need: Recommended**
 8 **and Preferred Alternatives**

Purpose and Need Metric	No Build Alternative	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Population and Employment Growth				
Provides Access to Planned Growth Areas ^a	Does not serve highest growth area (western Maricopa County, within the Study Area)	Best serves areas of greatest population and employment growth in the Study Area in Pinal and western Maricopa Counties (Casa Grande, Goodyear, Buckeye, and Wickenburg)	Best serves Casa Grande and Wickenburg growth areas	Best serves continued population and employment growth centered along existing I-10 and I-19 (Sahuarita, Tucson, Marana)
			Serves growth in Buckeye well, but does not provide as much access to the Goodyear/ SR 303L area as the Recommended Alternative	
Traffic Growth and Travel Time Reliability				
Reduces Travel Time for Long-Distance Traffic (2040 northbound travel time from Nogales to Wickenburg) ^b	297 minutes	234 minutes	236 minutes	250 minutes



Purpose and Need Metric	No Build Alternative	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Achieves LOS C or better in rural areas, LOS D or better in urban areas on I-11 ^b	LOS F on existing roads in some areas	LOS C or better on I-11	LOS C or better on I-11	LOS C in rural areas outside of Tucson LOS D on I-11 in urban areas (Tucson)
System Linkages and Regional Mobility				
Effectively attracts/diverts traffic from existing roadways, as measured by:				
Percent increase in VMT	No diversion of passenger vehicles or trucks	6 percent increase in passenger car and truck VMT	5 percent increase in passenger car and truck VMT	6 percent increase in passenger car and truck VMT
Percent increase in truck VMT		23 percent increase in truck VMT	21 percent increase in truck VMT	23 percent increase in truck VMT
Access to Economic Activity Centers				
Serves Key Economic Centers ^c	Serves 8 existing economic centers	Serves 16 economic centers, 8 existing and 8 emerging	Serves 15 economic centers, 6 existing and 9 emerging	Serves 17 economic centers, 8 existing and 9 emerging
Homeland Security and National Defense				
Provides an Alternate Regional Route ^d	No	Yes, for 247.4 miles of the total 276.1-mile-long alternative	Yes, for 219.5 miles of the total 276.0-mile-long alternative	Yes, for 143.1 miles of the total 267.8-mile-long alternative

1 ^a Planned growth areas included in this metric are shown as areas of growth on **Figure 1-4**.
 2 ^b Measured in the afternoon peak period.
 3 ^c Key economic centers shown as existing and emerging employment clusters on **Figure 1-4**.
 4 ^d Alternate regional route was reported by segment (lettered option) in the Draft Tier 1 EIS. The Final Tier 1 EIS reports this metric
 5 by miles because segmentation has changed, and mileage provides a consistent measurement across all alternatives.

6 6.5.3 Comparison of Impacted Resources

7 **Table 6-4** compares impacts for the Recommended and Preferred Alternatives where they have
 8 been quantified in **Chapter 3** (Affected Environment and Environmental Consequences) and
 9 **Chapter 4** (Draft Preliminary Section 4(f) Evaluation). Note there were no quantified differences
 10 for **Section 3.11** (Hazardous Materials); **Section 3.12** (Geology, Soils, and Prime and Unique
 11 Farmlands); **Section 3.15** (Temporary and Construction-Related Impacts); **Section 3.16**
 12 (Irreversible and Irrecoverable Commitment of Resources); and **Section 3.17** (Indirect and
 13 Cumulative Effects) as impacts are similar for these resources.

14 Under all Build Corridor Alternatives, construction of new transportation facilities could indirectly
 15 affect the type or pace of land use changes through the introduction of new access and more
 16 efficient travel corridors to undeveloped areas. Additionally, the Build Corridor Alternatives
 17 would add to the cumulative efficiency and mobility benefits provided by the transportation



1 system through the diversion of traffic, improved travel times, improved safety, and more direct
 2 routes. Indirect and cumulative impacts for all alternatives from potential future actions are
 3 discussed further in **Section 3.17** (Indirect and Cumulative Effects).

4 **Table 6-4. Comparison of Resources in the 2,000-foot-wide Corridors of the**
 5 **Recommended and Preferred Alternatives**

Title	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Land Use (Section 3.3)			
BLM Land (acres)	6,415	10,861	10,323
Private Land (acres)	40,939	38,596	39,999
State Trust Land (acres)	12,629	17,241	12,487
Community Resources, Title VI, and Environmental Justice (Section 3.5)			
Project Area within Minority or Low-Income Communities (# of acres)	29,257	15,786	18,790
Project Area within Minority or Low-Income Communities (% of total Project Area acres)	39%	24%	29%
Economic Impacts (Section 3.6)			
Gross Regional Product (\$ Billions)	\$12.2	\$11.7	\$9.6
Personal Income (\$ Billions)	\$10.3	\$10.1	\$8.5
Employment (Thousands of Job-Years)	136.2	130.2	106.7
Archaeological, Historical, Architectural, and Cultural Resources (Section 3.7)			
Percent covered by previous cultural resource surveys (% of total Project Area acres)	23%	28%	39%
Total recorded archaeological sites and historic structures within surveyed areas (number)	215	246	420
Estimated potentially NRHP-eligible archaeological sites and historic structures affected (number)	100	110	70
Total NRHP-listed or determined eligible historic districts and buildings affected (number)	0	0	4
Estimated unrecorded potentially NRHP-eligible historic districts and buildings affected (number)	4	3	5
Traditional Cultural Properties Potentially Directly Affected (number)	2	2	2



Title	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
Visual and Aesthetics (Section 3.9)			
BLM Visual Resource Management Class I (acres)	0	0	0
BLM Visual Resource Management Class II (acres)	0	0	0
BLM Visual Resource Management Class III (acres)	2,988	3,097	2,568
BLM Visual Resource Management Class IV (acres)	3,495	7,583	7,583
Water Resources (Section 3.13)			
Within Active Management Areas for Groundwater (miles)	258	270	247
Within Sole Source Aquifers (miles)	106	119	98
Groundwater Wells (number)	887	636	1,183
Impaired Waters in Proximity (miles)	35	32	41
Potential Waters of the US (miles)	306	323	312
National Wetlands Inventory (NWI) and Key Potential Wetlands (acres / number)	187 / 5	282 / 3	286 / 5
FEMA Floodplains (acres)	15,817	13,261	10,809
Biological Resources (Section 3.14)			
Riparian Areas (acres)	1,209	694	590
Important Bird Areas (acres)	1,464	1,133	572
Fragments Lost from Existing Large Intact Blocks (acres)	13,072	8,368	3,550
Section 4(f) Properties (Chapter 4)			
Potential Use of Section 4(f) Properties (number)	2	2	8

1 **6.6 Capital, Operations, and Maintenance Costs**

2 **Table 6-5** summarizes total costs (including right-of-way and capital costs) for the
 3 Recommended and Preferred Alternatives. Total project cost includes estimated construction
 4 cost (materials, labor, and equipment) and right-of-way acquisition, and was calculated using
 5 2017 cost data. Maintenance costs were also developed and are provided in **Table 6-6**.



1 **Table 6-5. Total Project Cost of the Recommended and Preferred Alternatives**

Corridor Option	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
A	\$0	\$0	\$0
B	N/A	N/A	\$586 million to \$5.4 billion ^a
D	\$2,082,061,000	\$2.1 to \$3.2 billion ^b	N/A
F ^c	\$1,916,370,000	N/A	N/A
F1 ^c	N/A	\$349,831,000	N/A
F2 ^c	N/A	\$1,116,472,000	\$1,116,472,000
I-10 Connector ^d	\$602,784,000	\$602,784,000	\$602,784,000
G1	N/A	N/A	\$0
G3	N/A	\$0	\$0
I1	N/A	\$425,705,000	\$425,705,000
I2	\$233,464,000	\$233,464,000	\$233,464,000
L	\$252,613,000	\$252,613,000	\$252,613,000
M	N/A	\$568,067,000	\$568,067,000
N	\$1,186,438,000	N/A	N/A
Q2	N/A	\$79,000,000	\$79,000,000
Q3	N/A	\$412,413,000	\$412,413,000
R	\$796,206,000	N/A	N/A
U/X	\$1,113,019,000	\$1,097,545,000	\$1,097,545,000
Total	\$8.2 billion^e	\$7.2 to \$8.3 billion	\$5.4 to \$10.2 billion

2 Source: Preliminary Cost Estimates Memo Version 5 (ADOT 2020c)

3 Note: Total project cost includes construction cost and right-of-way cost and was calculated using 2017 cost data.

4 ^a This Tier 1 EIS does not determine a design concept for the east option. Range of cost for the east option includes at-grade widening (lowest cost), a collector-distributor road system, elevated structures, or tunneling (highest cost).

6 ^b This Tier 1 EIS does not determine a design concept for the west option near the Tucson Mitigation Corridor. Range of cost for the west option includes a new at-grade freeway (lowest cost), elevated structures, or tunneling (highest cost).

8 ^c Recommended Alternative cost is for the entire length of Option F. The Preferred Alternative breaks Option F into F1 (included only in the west option) and F2 (included in both the west and east options).

10 ^d Although the alignments of the I-10 connector are different across the alternatives, the length and costs are the same.

11 ^e The Draft Tier 1 EIS cited a cost of \$7.6 billion (page 4-100). It has been revised in the Final Tier 1 EIS to include the cost of the I-10 connector.



1 **Table 6-6. Annual Maintenance Costs for the Recommended and Preferred**
2 **Alternatives**

Corridor Option	Lane Miles on Existing Routes	Lane Miles on New Routes	Cost per Lane Mile	Recommended Alternative	Preferred Alternative with West Option in Pima County	Preferred Alternative with East Option in Pima County
A ^a	206.9	–	\$14,040	\$2,905,000	\$2,905,000	\$2,905,000
B ^{a, b}	597.0	–	\$14,040	N/A	N/A	\$8,383,000
D ^b	–	354.5	\$11,200	\$3,970,000	\$3,970,000	N/A
F ^d	–	356.2	\$11,200	\$3,990,000	N/A	N/A
F1 ^d	–	72.1	\$11,200	N/A	\$808,000	N/A
F2 ^d	–	205.8	\$11,200	N/A	\$2,305,000	\$2,305,000
I-10 Connector		31.5	\$11,200	\$353,000	\$353,000	\$353,000
G1 ^a	52.5	–	\$14,040	N/A	N/A	\$737,000
G3 ^a	42.0	–	\$14,040	N/A	\$590,000	\$590,000
I1	–	51.1	\$11,200	N/A	\$572,000	\$572,000
I2	–	130.5	\$11,200	\$1,461,000	\$1,461,000	\$1,461,000
L	–	105.3	\$11,200	\$1,180,000	\$1,180,000	\$1,180,000
M	–	129.4	\$11,200	N/A	\$1,450,000	\$1,450,000
N	–	179.3	\$11,200	\$2,009,000	N/A	N/A
Q2 ^a	40.9	–	\$14,040	N/A	\$574,000	\$574,000
Q3 ^a	155.4	–	\$14,040	N/A	\$2,182,000	\$2,182,000
R	–	122.4	\$11,200	\$1,371,000	N/A	N/A
U/X ^{a, c}	43.0	300.6– 305.5	\$11,200	\$3,904,000	\$3,849,000	\$3,849,000
Total	–	–	–	\$21,143,000	\$22,199,000	\$26,541,000

3 ^a Maintenance costs for co-located options include all I-11 travel lanes.
4 ^b Maintenance costs for Options B and D are for at-grade facilities.
5 ^c Hybrid Option U/X assumes a unit cost for a new facility for the entire length.

6 **6.7 Areas of Controversy and Issues to be Resolved**

7 Due to the nature of the Tier 1 EIS process, there are outstanding issues and areas of
8 controversy to be resolved in the Tier 2 process. Specific commitments for additional analysis
9 are summarized succinctly in **Chapter 7** (Summary of Mitigation and Tier 2 Analysis) for
10 reference if ADOT embarks on a Tier 2 study.

11 The Preferred Alternative carries forward both the west option in Pima County (Recommended
12 or Green Alternative) and the east option in Pima County (Orange Alternative). Including these
13 two options in the Preferred Alternative will give ADOT the opportunity to make a more informed
14 decision after completing more detailed environmental studies and engineering in Tier 2.



1 Because both options impact Section 4(f) properties such as parks and cultural resources,
2 additional analysis is needed to identify the least overall harm to Section 4(f) properties.
3 Therefore, Tier 2 studies will analyze outstanding issues for both the west option and east
4 option in Pima County.

- 5 • For the west option in Pima County, agencies and the public requested additional
6 information on traffic, noise, and impacts to air quality, water quality, wildlife, historic
7 resources, and night skies. Sensitive resources in this area include Saguaro National Park,
8 Tucson Mitigation Corridor, Tucson Mountain Park, water recharge areas
9 (CAVSARP/SAVSARP), lands being set aside for conservation, and the Sonoran Desert
10 ecosystem as a whole.
- 11 • For east option in Pima County, Tier 2 studies will analyze options to expand I-10, such as
12 widening at grade, tunneling, or elevated structures, and associated impacts to surrounding
13 business, neighborhoods, Section 4(f) properties, parks, and historic resources. The City of
14 Tucson also requested that the option of eliminating frontage roads and using the space to
15 widen I-10 be studied further. Tier 2 engineering studies would address whether system and
16 service interchanges would need to be reconstructed.

17 Of particular importance to several agencies is the commitment that ADOT develop and fund
18 wildlife studies to inform design, as described in more detail in T2-Biological Resources-3 and
19 T2-Biological Resources-4 in **Chapter 7** (Summary of Mitigation and Tier 2 Analysis).

20 The final draft Tier 1 Section 106 programmatic agreement (PA) was distributed to consulting
21 parties on May 5, 2021, for final review and comment. Consultation is ongoing. The final draft
22 PA, included in this Final Tier 1 EIS in **Appendix E7** (Section 106 Consultation Summary and
23 Programmatic Agreement), reflects Section 106 consultation to date. If the PA is not executed
24 before the Tier 1 EIS Record of Decision is issued, it may be executed subsequently.
25 Construction on Tier 2 projects would not proceed until appropriate Section 106 agreement
26 documents are executed.

27 **6.8 Funding, Implementation, and Phasing**

28 **6.8.1 Funding**

29 At this time, no funding has been identified to plan, design, or construct any part of I-11,
30 including any Tier 2 analysis. The implementation of the corridor could entail federal, state, or
31 local funding; tolling; or private-public partnerships.

32 Federal spending on surface transportation is currently authorized under the 2015 Fixing
33 America's Surface Transportation Act, or "FAST Act," which includes the many formula,
34 discretionary grant, and loan programs that distribute federal transportation funds. A number of
35 federal funding programs could be explored to further develop I-11.

36 Public-private partnerships assist transportation and other government agencies through
37 collaborative funding and financing techniques that share risks and rewards for infrastructure
38 investments. Many public-private partnership projects apply alternative delivery techniques such
39 as design/build strategies to reduce costs and accelerate schedules. Public-private partnerships
40 also may apply managed lane or toll road methods to provide funding for the project.



1 **6.8.2 Planning and Programming**

2 Programming funds for a transportation projects in Arizona begins with a long-range planning
3 process, moves into a more realistic 20-year plan, and finally yields a 5-year program. ADOT's
4 current long-range transportation plan, *What Moves You Arizona*, does not specify a list of
5 projects (ADOT 2018c). The plan established an investment strategy that identifies what
6 percentage of the funds that pass through ADOT will go to preservation, modernization, and
7 expansion. Further study and construction of I-11 would be considered an expansion project.

8 ADOT's design and construction budget for highways, transit, airports, and highway support
9 facilities is covered in the Five-Year Transportation Facilities Construction Program (ADOT
10 2019b). The Five-Year Program is the lineup of projects funded for design and/or construction
11 and is revised annually. ADOT prioritizes projects for inclusion in the Five-Year Program
12 through a Planning to Programming (P2P) process. The P2P process begins by compiling a list
13 of prospective projects from ADOT Planning staff, Council of Governments, municipal planning
14 organizations, and ADOT District nominations. After the nominations are compiled, ADOT
15 undergoes a rigorous scoring process based on technical studies, policy considerations, and
16 safety service values to prioritize which projects will get funded for design and/or construction.
17 I-11 Tier 2 studies would follow this process as well, and would be considered for inclusion in
18 the Five-Year Program after first being nominated by local planning organizations and
19 community leaders that work closely with ADOT in the P2P process.

20 A potential project goes through several levels of review to become part of the tentative program
21 before being presented to the State Transportation Board for consideration and approval. A
22 public comment period and public hearings are also part of the process.

23 The regional planning organizations within the Study Area undertake a metropolitan planning
24 process to guide transportation investments and identify priority projects for funding in their
25 planning area. These also provide a process through which federal, state, regional, or local
26 funds could be allocated to advance I-11. Major revenue sources at a regional level can include
27 voter-approved taxes dedicated to transportation.

28 The ADOT and metropolitan planning processes that guide transportation investments consider
29 a number of factors when prioritizing potential projects such as I-11. These include:

- 30 • Availability of funding
- 31 • Stakeholder collaboration and feedback
- 32 • Integration into the current network and addressing areas with the greatest transportation
33 and redundancy needs
- 34 • Leveraging current and planned investments
- 35 • Ability to accommodate the full I-11 build configuration by acquiring right-of-way and
36 preserving access control
- 37 • Economic development needs



1 **6.8.3 Phasing**

2 Following the public review period for this Final Tier 1 EIS, FHWA and ADOT will publish a
3 Record of Decision that affirms a Selected Alternative. If FHWA and ADOT select a Build
4 Corridor Alternative in the Record of Decision, the build alternative would be implemented in
5 segments as funding is available. If the No Build Alternative is selected, no project would occur.

6 FHWA and ADOT have determined that the I-11 project from Nogales to Wickenburg has logical
7 termini and independent utility. ADOT will make a determination of logical termini and
8 independent utility before making a Tier 2 decision on smaller sections. Segments of
9 independent utility are portions of a project that may be constructed without other construction
10 projects or linkages; are not dependent upon other segments of the project to demonstrate
11 improvements to the transportation system; and would be considered complete and separate
12 projects.

13 ADOT may also phase Tier 2 projects according to the type of facility and extent of
14 improvements within a segment such as intersection improvements, additional access controls,
15 or construction of a two-lane or four-lane divided roadway that is later upgraded to interstate
16 standards.

17 For example, segments of I-11 that would be a new highway could follow a phased
18 implementation that first builds a smaller two-lane road (an interim facility), followed by projects
19 that incrementally widen the roadway or build and reconstruct interchanges, until the ultimate
20 facility is constructed to interstate standards. Segments of I-11 co-located with existing facilities
21 could also be incrementally widened as traffic needs warrant. Locations where I-11 connects
22 with existing facilities, such as the I-11/I-10 connection in Sahuarita, could first be implemented
23 as a normal service interchange and expanded to a system interchange when traffic needs
24 warrant. Care must be taken in a phased implementation plan to preserve the required right-of-
25 way; provide proper access controls; and implement the appropriate planning, design, and
26 construction methodology necessary for future interstate standards.

27 **6.8.4 Tier 2 Analysis**

28 ADOT will act as the lead agency on any future Tier 2 process for the I-11 project as FHWA and
29 ADOT entered a Memorandum of Understanding in April 2019 where ADOT was assigned
30 responsibility to conduct environmental reviews under NEPA (FHWA and ADOT 2019).

31 Before initiating a Tier 2 project, ADOT would verify the termini, identify the scope (two-lane,
32 four-lane, improvements to existing highway, etc.), and determine the specific class of NEPA
33 analysis. The Tier 2 process would include NEPA analysis to inform the selection of a specific
34 alignment within the 2,000-foot-wide corridor, site-specific environmental analyses, development
35 of site-specific mitigation measures, and preliminary design. The alignment is expected to be
36 approximately 400 feet wide, but will depend on site-specific constraints and requirements.
37 ADOT will continue to coordinate with tribes, public, and agencies prior to and during Tier 2
38 project-level analysis.

39 The Tier 2 analysis would be based on more specific corridor alignment information and design
40 features, allowing a more precise evaluation of the impacts. Additional air quality, noise,
41 biological resources, and other studies would be conducted to assess impacts to the natural



1 environment. The more specific corridor alignment and design information would allow a more
2 precise evaluation of the impacts related to individual parcels of land, displacements,
3 relocations, and communities within each Tier 2 study area. Further evaluation to identify and
4 quantify any adverse impacts and mitigation measures would occur and would comply with
5 requirements that the project not cause a disproportionately high and adverse effect on those
6 populations.

7 ADOT is not currently acquiring any right-of-way for I-11. The Tier 1 EIS identifies a 2,000-foot-
8 wide corridor within which ADOT will locate a 400-foot-wide specific alignment during future Tier
9 2 studies. ADOT does not anticipate acquiring right-of-way until after the Tier 2 environmental
10 process is underway and funding for the project is authorized. There is no specific timing for the
11 Tier 2 process as there is currently no funding for the future planning, design, right-of-way
12 needs, environmental studies, or construction for I-11.

13 See **Chapter 7** (Summary of Mitigation and Tier 2 Analysis) for a summary of specific Tier 2
14 studies and mitigation. Because this is a Tier 1 NEPA document, mitigation measures in the
15 Record of Decision represent commitments that will be implemented in I-11 Tier 2 projects.

16 A summary of future corridor opportunities, including emerging technologies, is provided in Draft
17 Tier 1 EIS **Section 2.5** (Future Corridor Opportunities).



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7 SUMMARY OF MITIGATION AND TIER 2 ANALYSIS

This chapter inventories mitigation commitments and Tier 2 analysis for the I-11 Project per **Section 3.3** to **Section 3.17** and **Chapter 4** (Preliminary Final Section 4(f) Evaluation) of this Final Tier 1 EIS.

ADOT assumed FHWA responsibility for carrying out environmental approvals under NEPA through a Memorandum of Understanding between FHWA and ADOT signed on April 16, 2019 (FHWA and ADOT 2019). With this assignment of federal environmental review responsibility, ADOT will be responsible for Tier 2 studies and implementation of mitigation. FHWA remains the federal lead agency responsible for the Record of Decision for the I-11 Corridor Tier I EIS.

FHWA and ADOT completed the analysis in this Final Tier 1 EIS to identify a 2,000-foot-wide preferred Build Corridor Alternative. Additional analysis in Tier 2 will inform (1) the selection of a specific alignment (approximately 400 feet wide) within the selected 2,000-foot-wide corridor and (2) the selection of the west option or east option in Pima County.

As required by NEPA, FHWA and ADOT considered measures to avoid, minimize, and mitigate impacts from the Project (generally referred to as mitigation measures) during this Tier 1 process. Additional studies and identification of mitigation will occur in Tier 2.

The following describes how the Project Team inventoried mitigation and Tier 2 analysis:

- **Tier 2 Analysis** represents further analyses and studies that ADOT will complete during Tier 2. Each commitment is numbered by resource with a 'T2' identifier. *Example: T2-Land Use-1.*
- **Mitigation Commitments** identify specific mitigation that ADOT is committing to implement as mitigation for the I-11 Project if a Build Alternative is selected. Each commitment is numbered by resource with an 'MM' identifier. *Example: MM-Recreation-3.*
- **Inventory.** Mitigation and Tier 2 commitments are inventoried in a matrix, shown in **Table 7-1**, which includes a description of the applicable geography. This information also is stored in a sortable spreadsheet in the Administrative Record to facilitate ease of compliance in Tier 2.
- **Additional Mitigation to be Evaluated in Tier 2** represents general best practices, permit requirements, and/or other mitigation strategies suggested by agencies or the public. These can be found in **Section 3.2** to **Section 3.17** and are not repeated in this chapter.
- The **No Build Alternative** would not require mitigation and therefore is not discussed.



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Table 7-1. Mitigation and Tier 2 Commitments

Number	Commitment	Type	Geography
T2-LandUse-1	Conduct environmental studies to identify specific effects to property, zoning regulations, neighborhoods, or community facilities to determine needed acquisitions, easements, and displacements.	Analysis	Corridor-Wide
T2-LandUse-2	Complete a Final Section 6(f) Evaluation to assess the ability of the Tier 2 Selected Alternative to avoid or minimize impacts to protected properties and identify specific mitigation measures to offset the remaining impacts.	Analysis	Corridor-Wide
T2-LandUse-3	Plan the specific alignment and locations of traffic interchanges in coordination with local government entities and with public input to address transportation needs and to minimize the potential for land use conflicts. Also see MM-Section 4(f)-7.	Analysis	Corridor-Wide
MM-LandUse-1	Avoid or minimize impacts to Section 6(f) properties. Coordinate with agencies that have jurisdiction over Section 6(f) properties. If Section 6(f) properties cannot be avoided, ADOT will identify replacement land.	Mitigation	Corridor-Wide
T2-Recreation-1	Coordinate with the appropriate land-managing agencies during the Tier 2 analysis to identify applicable laws, policies, and plans for each recreation site.	Analysis	Corridor-Wide
T2-Recreation-2	Coordinate with Bureau of Land Management when advancing transportation uses in the multi-use corridor within the Vulture Mine Recreation Management Zone.	Analysis	Buckeye to Wickenburg
T2-Recreation-3	Update the list of recreational resources within the project-level Study Area and identify the temporary and permanent impacts to each resource.	Analysis	Corridor-Wide
T2-Recreation-4	Review recreation planning documents applicable to the Study Area.	Analysis	Corridor-Wide
T2-Recreation-5	Identify site-specific mitigation measures at recreation resources.	Analysis	Corridor-Wide
MM-Recreation-1	Provide connectivity across I-11 for continued use of the Vulture Mine Off-Road Challenge Race Course in the Vulture Mine Recreation Management Zone.	Mitigation	Buckeye to Wickenburg
MM-Recreation-2	If the Preferred Alternative with west option is selected during Tier 2 studies, address updated access routes to Saguaro National Park and Tucson Mountain Park due to the relocation of Sandario Road on either end of the Tucson Mitigation Corridor as part of the Central Arizona Project Design Option.	Mitigation	Sahuarita to Marana
MM-Recreation-3	Evaluate connection between the two segments of the Palo Verde Regional Park in western Pinal County.	Mitigation	Casa Grande to Buckeye



Number	Commitment	Type	Geography
T2-Community Resources, Title VI, and Environmental Justice-1	Develop a Public Involvement Plan consistent with ADOT's agency-wide Public Involvement Plan (ADOT 2017n), which meets federal requirements for Title VI, Environmental Justice, and limited English proficiency in the transportation decision-making process. The public involvement plan will be developed early in the planning process with the focus of ensuring full and fair participation by all affected communities and populations. Coordination with local stakeholders and community representatives may be needed to understand the unique needs and priorities of those affected by the project, as well as determine the most effective means of engaging them in the outreach process.	Analysis	Corridor-Wide
T2-Community Resources, Title VI, and Environmental Justice-2	Identify and quantify impacts and mitigation measures to address adverse impacts to minority and low-income populations. Characterization of the demographics for affected communities would be conducted using the most recent census data and supplemental characterization techniques. The impact analysis would determine whether there are disproportionately high and adverse effects to the minority and/or low-income populations.	Analysis	Corridor-Wide
T2-Community Resources, Title VI, and Environmental Justice-3	Address environmental justice in accordance with the principles outlined in Executive Order 12898 and FHWA Order 6640.23A (FHWA 2012a). The analysis should include the following items, as established by the FHWA "Guidance on Environmental Justice and NEPA" (FHWA 2011a): Conduct major, proactive efforts to ensure meaningful opportunities for public participation, including activities to increase participation from low-income and minority populations; Compare the project effects (including indirect and cumulative effects) on minority and low-income populations with respect to those on the overall population. Fair distribution of the beneficial and adverse effects of the Project is the desired outcome; Determine whether the adverse effects are predominantly borne by the minority and low-income populations or are appreciably more severe or greater in magnitude on these populations than the adverse effects suffered by the non-minority and non-low-income populations (i.e., disproportionately high and adverse effects); Determine whether the Project might prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations; Determine whether there are practicable mitigation measures or alignment alternatives that would avoid or minimize the disproportionately high and adverse effect(s); Determine whether any of the affected communities include minorities, ethnic groups, senior populations, persons with disabilities, individuals with a low-income, or those who are limited English proficient.	Analysis	Corridor-Wide



Number	Commitment	Type	Geography
T2-Economic-1	Use an updated travel demand model that delineates population and employment projections combined with an assessment of planned/entitled private developments to determine locations most suitable for ensuring transportation system safety and mobility.	Analysis	Corridor-Wide
T2-Economic-2	Use a more detailed alignment to analyze impacts related to businesses (including loss of access).	Analysis	Corridor-Wide
T2-Economic-3	Evaluate impacts on outdoor recreation and the overall regional economy by using recent, relevant outdoor recreation data such as the Outdoor Recreation Satellite Accounts. The Outdoor Recreation Satellite Accounts use tracker surveys to collect information on visitor spending, on attractions that generate tourist visits, and on how the alternatives might affect tourists' decisions.	Analysis	Corridor-Wide
MM-Economic-1	Locate traffic interchanges to provide transportation access to state lands and other developable areas while balancing convenient access with potential impacts on parks and outdoor tourism destinations as a result of the added interchanges.	Mitigation	Corridor-Wide
MM-Economic-2	Participate in continued, long-term planning efforts with metropolitan planning organizations, local jurisdictions, resource agencies, and private stakeholders to cooperatively plan development along the I-11 corridor. The effort would coordinate wildlife connectivity, local land use planning, and context sensitive design for the I-11 facility. Details regarding long-term planning efforts are dependent on the planning process for each individual organization, jurisdiction, and/or agency. ADOT commits to participating in these efforts but does not have the jurisdiction to lead them (MM-Indirect-1).	Mitigation	Corridor-Wide
T2-Cultural-1	Collect additional information to further evaluate the west and east options of the Preferred Alternative in Pima County and arrange for cultural resource surveys to inventory and evaluate the NRHP eligibility of cultural resources within the area of potential effects of each Tier 2 project, in coordination with the Section 106 Consulting Parties and pursuant to the I-11 Final Programmatic Agreement (Appendix E7 [Section 106 Consultation Summary and Programmatic Agreement])the requirements of Section 106 of the National Historic Preservation Act, any other applicable regulations, and any executed agreement documents. This will include, as necessary and upon request from Consulting Tribes, additional ethnographic and/or traditional cultural property studies.	Analysis	Corridor-Wide



Number	Commitment	Type	Geography
MM-Cultural-1	Implement commitments identified during the Tier 1 process; the commitments in the I-11 Final Programmatic Agreement (Appendix E7 [Section 106 Consultation Summary and Programmatic Agreement]), if executed; and any additional commitments from the Tier 2 process. During the Tier 1 process, ADOT has committed to the avoidance of adverse effects upon AZ T:14:115(ASM). ADOT has also committed to the avoidance of adverse effects upon historic canals which have been or may be determined eligible for listing in the NRHP pursuant to 36 CFR §§ 60.4(a), (b), and/or (c); and in such instances as the consulting party or parties with jurisdiction over said structures request avoidance.	Mitigation	Corridor-Wide
MM-Cultural-2	Work to avoid or minimize adverse effects on historic properties listed in or eligible for the NRHP, including traditional cultural properties, as well as cultural resources not yet evaluated for NRHP eligibility. In coordination with the Section 106 Consulting Parties, ADOT would develop treatment measures to mitigate any unavoidable adverse effects. This will include, as necessary and upon request from Consulting Tribes, additional ethnographic and/or traditional cultural property studies.	Mitigation	Corridor-Wide
T2-Noise-1	Conduct a Tier 2 traffic noise analysis in accordance with the current ADOT Noise Abatement Requirements as well as 23 CFR 772. The Tier 2 analysis will include conducting noise measurements to characterize the existing noise environment in areas adjacent to segments of I-11 that consist of a new highway on new alignment where a substantial noise increase (a 15 dBA increase over existing noise levels) would be likely. Noise abatement measures will be considered where traffic noise impacts are identified, and abatement measures found to be both feasible and reasonable will be incorporated into the project.	Analysis	Corridor-Wide
T2-Noise-2	Evaluate potential construction noise impacts and assess construction noise mitigation, as needed and in accordance with current ADOT Noise Abatement Requirements. ADOT will determine whether any additional measures are needed in the plans or specifications to minimize or eliminate adverse impacts from construction noise.	Analysis	Corridor-Wide
MM-Noise-1	Consider noise abatement measures where traffic noise impacts are identified during Tier 2 analysis. Abatement measures found to be both feasible and reasonable will be incorporated into the project.	Mitigation	Corridor-Wide



Number	Commitment	Type	Geography
T2-Visual-1	Assess individual Tier 2 projects using FHWA's Visual Impact Assessment Scoping Questionnaire (FHWA 2015). Depending on the findings of the questionnaire, an Abbreviated Visual Impact Assessment may be needed, or a more involved Standard or Expanded Visual Impact Assessment may be required. Simulations may also be prepared to assist with evaluating potential visual impacts.	Analysis	Corridor-Wide
T2-Visual-2	Identify site-specific mitigation measures for sensitive viewpoints, including Saguaro National Park West and Tucson Mountain Park.	Analysis	Corridor-Wide
MM-Visual-1	Comply with applicable local ordinances that regulate outdoor lighting to minimize light pollution.	Mitigation	Corridor-Wide
MM-Visual-2	Comply with appropriate level of FHWA Visual Impact Assessment Guidelines (FHWA 2015) during Tier 2 studies.	Mitigation	Corridor-Wide
MM-Visual-3	Select roadway lighting that is compatible with locally adopted dark sky objectives and policies, where applicable.	Mitigation	Corridor-Wide
MM-Visual-4	If the Preferred Alternative with west option is selected during Tier 2 studies, avoid use of roadway lighting at all in the vicinity of the Tucson Mitigation Corridor and Saguaro National Park, except at locations where safety requirements deem it necessary.	Mitigation	Sahuarita to Marana
T2-Air Quality-1	Conduct a detailed air quality analysis for further environmental evaluation. Transportation conformity analysis could be required based on the nonattainment and maintenance designations of the areas surrounding the Study Area. Attainment status for the applicable areas will be re-evaluated during Tier 2 analysis.	Analysis	Corridor-Wide
T2-Air Quality-2	Assess vehicle emissions along the I-11 Corridor. Modeling of carbon monoxide and particulate matter at the project level will be conducted to determine potential localized air quality effects (hotspots) from future construction and operation of the I-11 Corridor.	Analysis	Corridor-Wide
T2-Air Quality-3	Quantitatively assess greenhouse gas emissions using USEPA's Motor Vehicles Emissions Simulator (MOVES) model or the model in place at the time of Tier 2 analyses.	Analysis	Corridor-Wide



Number	Commitment	Type	Geography
T2-Air Quality-4	Conduct an analysis of localized air quality impacts to sensitive areas, including the Saguaro National Park. The analysis will assess National Ambient Air Quality Standards and criteria pollutants and will consider the spacing of interchanges and associated idling impacts on adjacent receptors. ADOT will provide the opportunity for NPS to review the air quality emission inventory and modeling protocols.	Analysis	Corridor-Wide
T2-HazardousMaterials-1	Conduct detailed hazardous materials evaluations, including review of regulatory agency files; subsurface investigations to quantify the vertical and horizontal distribution of hazardous materials; and remediation planning as needed.	Analysis	Corridor-Wide
T2-HazardousMaterials-2	Evaluate engineering solutions to contain spills in areas that have a high potential to impact sensitive receptors, including water resources, groundwater recharge areas, wildlife habitat, and recreation resources.	Analysis	Corridor-Wide
MM-HazardousMaterials-1	Prior to construction, prepare and implement a project-specific Health and Safety Plan and Hazardous Materials Management Plan to address potential hazardous materials that could be encountered. These plans will consist of specific measures to protect worker and public health and safety, as well as programs to manage contaminated materials during construction.	Mitigation	Corridor-Wide
MM-HazardousMaterials-2	If unknown contaminated media is encountered during construction, stop working until the contamination is properly evaluated and measures are developed to protect worker health and safety in accordance with the project-specific Health and Safety Plan and Hazardous Materials Management Plan.	Mitigation	Corridor-Wide
MM-HazardousMaterials-3	Identify practical measures to avoid, minimize, and mitigate the environmental consequences from hazardous materials.	Mitigation	Corridor-Wide
MM-HazardousMaterials-4	Implement preparedness plans, such as the Arizona State Emergency Response and Recovery Plan (Arizona Department of Emergency and Military Affairs 2017).	Mitigation	Corridor-Wide
T2-Soils-1	Identify and review regulations related to geologic resources based on local land ownership and the intended use.	Analysis	Corridor-Wide
T2-Soils-2	As part of design and geotechnical investigations, determine the amount of ground disturbance anticipated and factors that affect the potential for soils to erode by water and wind, including physical characteristics, slope gradient, vegetative cover, surface roughness, and rainfall or wind intensity.	Analysis	Corridor-Wide
T2-Soils-3	Evaluate existence and status of mining claims and active mining operations.	Analysis	Corridor-Wide



Number	Commitment	Type	Geography
T2-Soils-4	Identify and determine the extent of impacts to specific geologic, soil, and farmland resources.	Analysis	Corridor-Wide
T2-Soils-5	Conduct site-specific field investigations during design to validate interpretations and confirm soil characteristics.	Analysis	Corridor-Wide
T2-Soils-6	Collect any additional or refined data (Natural Resources Conservation Service, United States Geological Survey, or other sources) on geotechnical conditions that could affect design and performance such as shrink/swell, compression/collapse, and corrosion potential.	Analysis	Corridor-Wide
T2-Soils-7	Identify the number of irrigated acres for refinement of potential prime or unique farmland impacts through Natural Resources Conservation Service completion of United States Department of Agriculture Form AD-1006 (Farmland Conversion Impact Rating form).	Analysis	Corridor-Wide
T2-Soils-8	Identify areas of current and planned development that should be removed from prime and unique farmland categorization through the analysis of local land use and zoning maps.	Analysis	Corridor-Wide
MM-Soils-1	Monitor disturbance and erosion areas during construction and through restoration.	Mitigation	Corridor-Wide
MM-Soils-2	Avoid known land subsidence areas when feasible.	Mitigation	Corridor-Wide
MM-Soils-3	Avoid known earth fissures when feasible.	Mitigation	Corridor-Wide
MM-Soils-4	Develop and implement a reclamation and revegetation plan.	Mitigation	Corridor-Wide
MM-Soils-5	Coordinate with Natural Resources Conservation Service as part of compliance with the Farmland Protection Policy Act.	Mitigation	Corridor-Wide
T2-Water Resources-1	Coordinate with USEPA regarding proposed construction within sole source aquifers.	Analysis	Sahuarita to Marana
T2-Water Resources-2	Conduct field delineations of potential waters of the US and wetlands within the final project footprint, determine which potential waters of the US and wetlands are jurisdictional under the USACE definition, and identify specific Clean Water Act permitting requirements and mitigation. Tier 2 analyses will consider the requirement that no discharge of dredged or fill materials may be permitted if there is a practicable alternative that would have less adverse impact on the aquatic ecosystem.	Analysis	Corridor-Wide



Number	Commitment	Type	Geography
T2-Water Resources-3	Provide clear documentation of the Tier 1 alternatives analyses and selection process to inform the Clean Water Act Section 404 permitting process. Conduct an alternative analysis and selection process for Tier 2 alternatives in support of Clean Water Act Section 404 Individual Permit applications and per the requirements of Executive Order 11990.	Analysis	Corridor-Wide
T2-Water Resources-4	Assess which MS4 applies in which area, and whether any small operators (Phase II MS4s) are located within the Tier 2 study area.	Analysis	Corridor-Wide
T2-Water Resources-5	Identify USACE civil works projects that may be altered by project construction and obtain USACE approval prior to alteration of such projects as required by Section 14 of the Rivers and Harbors Act.	Analysis	Corridor-Wide
T2-Water Resources-6	Identify and assess project effects to unmapped floodplains, levees, and flood control basins that may be altered by project construction. Provide flood control districts and jurisdictions the opportunity to provide information regarding unmapped floodplains, levees, and flood control basins.	Analysis	Corridor-Wide
T2-Water Resources-7	Conduct hydraulic computer modeling or other assessments of impacts on floodplains. Coordinate with local floodplain administrators to discuss the need for Floodplain Use Permits and mitigation. Assess impacts on high-hazard flood areas versus low-hazard (500-year-flood zone) areas and assess floodplain areas that have not been categorized in more detail; additional information sources such as Pima County's mapped regulatory riparian resources may be used to inform this analysis. Assess existing floodplain issues and potential solutions. An avoidance alternative outside of the 2,000-foot-wide corridor may be considered.	Analysis	Corridor-Wide
MM-Water Resources-1	Develop location-specific avoidance, minimization, and mitigation measures for water resources. Avoid and minimize impacts on waters of the US, including wetlands, to the maximum extent practicable.	Mitigation	Corridor-Wide



Number	Commitment	Type	Geography
MM-Water Resources-2	Incorporate best management practices designed to reduce erosion, minimize sedimentation, and eliminate non-stormwater pollutants into the project design. Standard best management practices are identified in ADOT's Erosion and Pollution Control Manual for Highway Design and Construction (2012) and ADOT's Standard Specifications for Road and Bridge Construction (2008). The most recent versions of these design standards will apply during Tier 2 analysis. Among others, restrictions and requirements that will be incorporated during construction include the following: Wastewater will be contained and disposed of at an approved off-site location; No equipment refueling will occur within drainages; The contractor will keep a regulated work area free of litter and trash; The contractor will remove all construction material and debris from the construction site upon completion of the project.	Mitigation	Corridor-Wide
MM-Water Resources-3	Site the final corridor footprint to avoid sensitive water resources to the maximum extent practicable. Examples of resources that could be avoided through strategic footprint siting include the Tres Rios Water Reclamation Facility, Sweetwater Wetlands Park, certain segments of the Santa Cruz River, and the Nogales International Wastewater Treatment Plant, among others.	Mitigation	Corridor-Wide
MM-Water Resources-4	Comply with federal, state, and local regulations pertaining to water resources and acquire the necessary permits and approvals prior to project construction.	Mitigation	Corridor-Wide
MM-Water Resources-5	Coordinate with federal, state, and local jurisdictions as appropriate to identify water resources of concern and to develop strategies to avoid and minimize impacts.	Mitigation	Corridor-Wide
T2-Biological Resources-1	Continue to work with AGFD to determine compensation for the loss of wildlife habitat. Also continue to work with agencies prior to and during the Tier 2 process to conduct surveys needed to identify occupied habitat for ESA-listed species at the time of the Tier 2 project and to develop specific conservation measures to avoid, minimize, or mitigate impacts to listed species.	Analysis	Corridor-Wide
T2-Biological Resources-2	Continue to work with federal and state agencies as well as affected municipalities during the Tier 2 process to evaluate potential impacts to other sensitive species listed by these entities. Work with tribes during the Tier 2 process to avoid or minimize effects to tribal sensitive species.	Analysis	Corridor-Wide



Number	Commitment	Type	Geography
T2-Biological Resources-3	Continue to work with AGFD and other stakeholders and partners prior to and during the Tier 2 process to develop and fund appropriate studies to evaluate wildlife movement and roadway mortality. Sufficient time (at least 2 to 4 years) will be given to ensure the studies acquire adequate data for guiding the development of mitigation measures. Tier 2 impact analyses will focus on refining information relating to specific impact areas within known wildlife linkages and corridors identified now and in the future.	Analysis	Corridor-Wide
T2-Biological Resources-4	Conduct tracking studies using camera traps, satellite telemetry, track plates, or other methods to identify spatial and temporal use patterns of target species within the Study Area. These tracking studies, as well as collision studies, will be utilized to identify sites where overpasses or underpasses could be installed. ADOT will implement on-the-ground mitigation based on recommendations generated by these studies, such as constructing wildlife crossings where previous crossings by wildlife have been documented and building culverts of a specific size and design for wildlife occurring in specific locations in the Study Area. Also existing culverts, bridges, and other roadway features that are in place along co-located highways will be monitored to identify the species that use these and the degree to which these existing features are effective at maintaining movement across the highway barriers.	Analysis	Corridor-Wide
T2-Biological Resources-5	Prepare biological evaluation for the Tier 2 studies and negotiate compensatory mitigation with USFWS if impacts to Endangered Species Act-listed species or habitat are determined likely to occur.	Analysis	Corridor-Wide
T2-Biological Resources-6	Analyze impacts from the Preferred Alternative with west option to Pima County Conservation Lands System lands and coordinate with Pima County to minimize potential impacts and identify appropriate mitigation strategies.	Analysis	Sahuarita to Marana
T2-Biological Resources-7	Partner with state and federal agencies during the Tier 2 design process and use data obtained from habitat suitability studies to inform design features to minimize impacts to the Sonoran desert tortoise and its habitat.	Analysis	Corridor-Wide
T2-Biological Resources-8	Continue to work with federal and state agencies as well as affected municipalities during the Tier 2 process to evaluate potential impacts to other wildlife corridors designated by these entities and not evaluated in detail in this Tier 1 EIS.	Analysis	Corridor-Wide



Number	Commitment	Type	Geography
MM-Biological Resources-1	Participate, support, and commit to long-term invasive and noxious weed management efforts in the I-11 corridor. To effectively combat noxious and invasive weeds, a coordinated effort across federal, state, and local levels is required. Noxious and invasive weed control on Bureau of Land Management or USFS lands would occur in accordance with previously approved environmental assessments. Long-term management of invasive and noxious weeds would be necessary to minimize indirect and cumulative effects to the Pima pineapple cactus and its habitat.	Mitigation	Corridor-Wide
MM-Biological Resources-2	Notify the Arizona Department of Agriculture prior to the start of construction, if needed, to compensate for impacts to native plants.	Mitigation	Corridor-Wide
MM-Biological Resources-3	Discuss the need for habitat compensation with AGFD during the Tier 2 process. Arizona Game and Fish Commission Policy A1.9 and Department Policy 12.3 (AGFD 1994) state the Department shall seek compensation at a 100 percent level, when feasible, for actual or potential habitat losses resulting from land and water projects.	Mitigation	Corridor-Wide
MM-Biological Resources-4	Coordinate with AGFD and relevant agencies and stakeholders to determine wildlife connectivity data needs and study design. ADOT will then fund and facilitate implementation of identified studies prior to the initiation of the Tier 2 process, due to the timeline required (likely 2 to 4 years) to collect and analyze sufficient data before draft design plans begin to limit the mitigation measures possible. ADOT and the stakeholders will identify the crossing structures, design features, and supporting mitigation measure or conservation necessary to facilitate the movement of wildlife through the roadway barrier and will incorporate the solutions into subsequent I-11 projects.	Mitigation	Corridor-Wide
MM-Biological Resources-5	Establish partnering opportunities with key landowners (e.g., private, BLM, Bureau of Reclamation, Maricopa County, Pinal County, Pima County, and Santa Cruz County) and appropriate municipal, county, state, and federal agencies prior to and during the Tier 2 process for long-term planning strategies.	Mitigation	Corridor-Wide
MM-Biological Resources-6	Evaluate the Wildlife Connectivity Assessment reports from Pima, Pinal, Maricopa, Santa Cruz, and Yavapai Counties to identify and, if possible, avoid I-11 impacts on the diffuse, landscape, and riparian wildlife movement areas identified in each report prior to the Tier 2 analysis.	Mitigation	Corridor-Wide
MM-Biological Resources-7	Evaluate structures designed to enhance wildlife connectivity, such as wildlife overpasses and underpasses, and fencing to funnel wildlife to these structures in association with AGFD and relevant agencies and stakeholders.	Mitigation	Corridor-Wide



Number	Commitment	Type	Geography
MM-Biological Resources-8	Avoid or minimize impacts to designated or proposed critical habitat. If impacts to critical habitat cannot be avoided, consultation with USFWS will occur during the Tier 2 analysis.	Mitigation	Corridor-Wide
MM-Biological Resources-9	Conduct a thorough habitat assessment in all areas that have potential habitat for Endangered Species Act-listed species for the section being studied prior to the Tier 2 process. If suitable habitat occurs within the construction footprint, ADOT will avoid or minimize impacts. Additionally, pre-construction surveys will be completed for all Endangered Species Act-listed species, or it will be assumed that the species occurs on-site. For the southwestern willow flycatcher, western yellow-billed cuckoo, and Yuma Ridgway's rail, 2 years of breeding season surveys will be conducted prior to the Tier 2 process.	Mitigation	Corridor-Wide
MM-Biological Resources-10	Continue to honor commitments within the Candidate Conservation Agreement for the Sonoran desert tortoise in Arizona (USFWS 2015a).	Mitigation	Corridor-Wide
MM-Biological Resources-11	Conduct habitat suitability surveys within agency-mapped tortoise habitat that may be impacted by the I-11 section being considered prior to the Tier 2 process.	Mitigation	Corridor-Wide
MM-Biological Resources-12	Follow ADOT's existing mitigation strategies for any future I-11 segments selected for construction that are located within Sonoran desert tortoise habitat. ADOT has developed comprehensive Sonoran desert tortoise mitigation that includes, but is not limited to, education of contractors and ADOT staff on tortoise awareness, pre-construction surveys, relocation of tortoises, on-site monitoring of construction activities, and best management practices designed to reduce potential tortoise mortalities during construction.	Mitigation	Corridor-Wide
MM-Biological Resources-13	Avoid widening I-19 to the east along the Santa Cruz River and impacting southwestern willow flycatcher, yellow-billed cuckoo, and their critical habitat; Gila topminnow; and Northern Mexican garter snake habitat; conduct pre-construction surveys where appropriate; and consult with USFWS, as needed (Option A).	Mitigation	Nogales to Sahuarita
MM-Biological Resources-14	Minimize the construction footprint to the extent possible and improve or construct wildlife crossings that jaguar and ocelots will use (Option A).	Mitigation	Nogales to Sahuarita
MM-Biological Resources-15	Avoid or minimize construction footprint through quality Pima pineapple cactus habitat, survey suitable habitat 1 year prior to the Tier 2 process to inform design; implement long-term control of invasive and noxious weeds; and negotiate compensatory mitigation with USFWS, as needed (Option A).	Mitigation	Nogales to Sahuarita



Number	Commitment	Type	Geography
MM-Biological Resources-16	Avoid or minimize impacts to the riparian corridor associated with the Santa Cruz River. The need for potential additional wildlife crossings would be assessed and implemented where warranted to preserve wildlife movement. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Option A).	Mitigation	Nogales to Sahuarita
MM-Biological Resources-17	Avoid or minimize impacts to the Santa Rita-Tumacácori Linkage and Santa Rita-Sierrita Detailed Linkage. Assess whether recommendations provided in the specific or county linkage reports can be used to improve or construct wildlife crossings in these linkages. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Option A).	Mitigation	Nogales to Sahuarita
MM-Biological Resources-18	Conduct 2 years of pre-construction surveys during the breeding season in suitable habitat for yellow-billed cuckoo; implement seasonal restrictions; and consult with USFWS, as needed (Option B or Preferred Alternative with east option). Avoid widening I-19 or I-10 into the Santa Cruz River floodplain.	Mitigation	Sahuarita to Marana
MM-Biological Resources-19	If the Preferred Alternative with east option is selected during Tier 2 studies, avoid or minimize impacts to the Santa Rita-Sierrita Detailed Linkage, Tucson-Tortolita-Santa Catalina Linkage, and Coyote-Ironwood-Tucson Detailed Linkage. Assess whether recommendations provided in the specific or county linkage reports can be used to improve and construct wildlife crossings in these linkages. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Option B or Preferred Alternative with east option).	Mitigation	Sahuarita to Marana
MM-Biological Resources-20	Avoid or minimize construction footprint through quality Pima pineapple cactus habitat; survey suitable habitat 1 year prior to the Tier 2 process to inform design; implement long-term control of invasive and noxious weeds; and negotiate compensatory mitigation with USFWS, as needed.	Mitigation	Sahuarita to Marana
MM-Biological Resources-21	Avoid critical and occupied habitat for the Chiricahua leopard frog that occurs adjacent to the southern end of this option (Options C, D, CAP Option, I-10 Connector).	Mitigation	Sahuarita to Marana
MM-Biological Resources-22	Avoid or minimize impacts to the Santa Rita-Sierrita Detailed Linkage, Coyote-Ironwood-Tucson Detailed Linkage. Assess whether recommendations provided in the linkage-specific or county linkage reports can be used to improve and construct wildlife crossings in these linkages. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Options C, D, CAP Option, I-10 Connector).	Mitigation	Sahuarita to Marana



Number	Commitment	Type	Geography
MM-Biological Resources-23	If the Preferred Alternative with west option is chosen during Tier 2, studies will be developed to avoid, minimize, or mitigate impacts to the Tucson Mitigation Corridor, including coordination with Bureau of Reclamation, AGFD, and other relevant agencies to improve and design wildlife crossings in and near the Tucson Mitigation Corridor. Specific mitigation related to the Tucson Mitigation Corridor includes (1) relocating and reclaiming Sandario Road; (2) conducting wildlife studies prior to the Tier 2 process; (3) aligning I-11 wildlife crossing structures to match the existing CAP canal siphons (seven crossings total); (4) creating additional wildlife crossing(s) near the Tucson Mitigation Corridor depending on the results of wildlife studies; (5) acquiring property (at a minimum 1:1 ratio) to support additional wildlife connectivity corridors between the Tucson Mountains and the Roskrige and Silver Bell Mountains for the number of acres of the Tucson Mitigation Corridor that will be impacted by the project; and (6) implementing design restrictions, such as no interchanges in the Tucson Mitigation Corridor or between Snyder Hill Road and Manville Road, and minimizing the width of I-11, to limit the I-11 footprint in the Tucson Mitigation Corridor area.	Mitigation	Sahuarita to Marana
MM-Biological Resources-24	Avoid or minimize impacts to the Santa Cruz River along this option; conduct 2 years of pre-construction breeding season surveys for yellow-billed cuckoo; implement seasonal restrictions; and consult with USFWS, as needed (Option F).	Mitigation	Marana to Casa Grande
MM-Biological Resources-25	Avoid or minimize impacts to the Coyote-Ironwood-Tucson Detailed Linkage, Ironwood-Picacho Linkage. Assess whether recommendations provided in the linkage-specific or county linkage reports can be used to improve and construct wildlife crossings in these linkages. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Option F).	Mitigation	Marana to Casa Grande
MM-Biological Resources-26	Avoid or minimize impacts to the Ironwood-Picacho Linkage. Assess whether recommendations provided in the linkage-specific or county linkage reports can be used to improve and construct wildlife crossings in these linkages. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Option G, not applicable to the Preferred Alternative).	Mitigation	Marana to Casa Grande
MM-Biological Resources-27	Avoid or minimize impacts to the Gila Bend-Sierra Estrella Linkage. Assess whether recommendations provided in the linkage-specific or county linkage reports can be used to improve and construct wildlife crossings in these linkages. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Options K and L).	Mitigation	Casa Grande to Buckeye



Number	Commitment	Type	Geography
MM-Biological Resources-28	Avoid or minimize impacts to the Buckeye Hills East-Sonoran Desert National Monument Linkage. Assess whether recommendations provided in the linkage-specific or county linkage reports can be used to improve and construct wildlife crossings in these linkages. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Option M).	Mitigation	Casa Grande to Buckeye
MM-Biological Resources-29	Minimize the footprint of the bridge crossing the Gila River to the extent possible; conduct 2 years of pre-construction breeding season surveys for yellow-billed cuckoo, southwestern willow flycatcher, and Yuma Ridgway's rail suitable habitat; implement seasonal restrictions; and consult with USFWS, as needed (Option N, not applicable to the Preferred Alternative).	Mitigation	Casa Grande to Buckeye
MM-Biological Resources-30	Avoid or minimize impacts to the Gila River riparian corridor. The need for potential additional wildlife crossings will be assessed to preserve wildlife movement. Coordination with relevant agencies would occur to implement modifications that will enhance wildlife movement (Option N, not applicable to the Preferred Alternative).	Mitigation	Casa Grande to Buckeye
MM-Biological Resources-31	Avoid or minimize impacts to the Gila Bend-Sierra Estrella Linkage. Assess whether recommendations provided in the linkage-specific or county linkage reports can be used to improve and construct wildlife crossings in these linkages. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Option Q1, not applicable to the Preferred Alternative).	Mitigation	Casa Grande to Buckeye
MM-Biological Resources-32	Minimize the footprint of bridge widening or new bridge construction on the SR 85 crossing the Gila River to the extent possible; conduct two years of pre-construction, breeding season surveys in suitable habitat for yellow-billed cuckoo, southwestern willow flycatcher, and Yuma Ridgway's rail; implement seasonal restrictions; and consult with USFWS, if species present, as needed (Option Q2).	Mitigation	Casa Grande to Buckeye
MM-Biological Resources-33	Avoid or minimize impacts to the Gila River riparian corridor. The need for potential additional wildlife crossings will be assessed to preserve wildlife movement. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Option Q2).	Mitigation	Casa Grande to Buckeye
MM-Biological Resources-34	Minimize construction in the Gila River floodplain to the extent possible; conduct 2 years of pre-construction, breeding season surveys in suitable habitat for yellow-billed cuckoo; implement seasonal restrictions; and consult with USFWS, if species present, as needed (Options Q3 and R).	Mitigation	Casa Grande to Buckeye



Number	Commitment	Type	Geography
MM-Biological Resources-35	Avoid, minimize, and mitigate impacts to the White Tank-Belmont Hieroglyphics Linkage, Wickenburg-Hassayampa Linkage and primary and secondary wildlife crossing structures on Reclamation's CAP canal. Assess whether recommendations provided in the linkage-specific or county linkage reports can be used to improve and construct wildlife crossings in these linkages. Coordinate with relevant agencies to implement modifications that will enhance wildlife movement (Options S, U, and X).	Mitigation	Buckeye to Wickenburg
MM-Indirect-1	Participate in continued, long-term planning efforts with metropolitan planning organizations, local jurisdictions, resource agencies, and private stakeholders to cooperatively plan development along the I-11 corridor. The effort would coordinate wildlife connectivity, local land use planning, and context sensitive design for the I-11 facility. Details regarding long-term planning efforts are dependent on the planning process for each individual organization, jurisdiction, and/or agency. ADOT commits to participating in these efforts but does not have the jurisdiction to lead them.	Mitigation	Corridor-Wide
MM-Indirect-2	If the Preferred Alternative with west option is selected during Tier 2 studies, avoid building exits or interchanges between West Snyder Hill Road and Manville Road in the area around the Tucson Mitigation Corridor in order to limit project-induced development.	Mitigation	Sahuarita to Marana
T2-Section 4(f)-1	If the Preferred Alternative east option is selected during Tier 2 studies, ADOT will examine roadway design solutions to avoid or minimize impacts to Section 4(f) properties in downtown Tucson. Examples of such solutions would include, but may not be limited to, applying minimum required roadway cross sections, and shifting the proposed roadway alignment to avoid some properties, elevating I-11 over I-10, tunneling I-11 under I-10, and removing frontage roads. The benefits and impacts of design solutions will be quantified, compared, and reported in Tier 2 analyses. Such reporting will also enable comparison of the Preferred Alternative east option findings with those of the Preferred Alternative west option in Tier 2.	Analysis	Nogales to Sahuarita
T2-Section 4(f)-2	If the Preferred Alternative east option is selected during Tier 2 studies, ADOT will develop measures to minimize harm during Tier 2 in coordination with the officials with jurisdiction over the affected properties in downtown Tucson.	Analysis	Nogales to Sahuarita
T2-Section 4(f)-3	Coordinate with Central Arizona Water Conservation District and the Bureau of Reclamation on the applicable design standards in Tier 2 studies.	Analysis	Corridor-Wide



Number	Commitment	Type	Geography
T2-Section 4(f)-4	Continue considering ways to avoid use of Section 4(f) properties through engineering design and mitigation.	Analysis	Corridor-Wide
T2-Section 4(f)-5	Evaluate the need for and effectiveness of measures to mitigate impacts to Section 4(f) properties. Types of measures to be evaluated include replacement of land and facilities of comparable value and function; compensation; restoration, preservation, interpretation, and recordation (such as for historic structures and properties); and other types of mitigation developed in coordination with the officials with jurisdiction over Section 4(f) properties.	Analysis	Corridor-Wide
T2-Section 4(f)-6	Continue coordinating with officials with jurisdiction in Tier 2 regarding potential impacts to Section 4(f) properties. Where impacts to Section 4(f) properties potentially would occur, coordination will focus on identifying appropriate and reasonable measures to minimize and mitigate impacts.	Analysis	Corridor-Wide
MM-Section 4(f)-1	Coordinate with the Bureau of Reclamation, NPS, AGFD, and Pima County regarding the Tucson Mitigation Corridor during Tier 2 studies.	Mitigation	Corridor-Wide
MM-Section 4(f)-2	Relocate and reclaim Sandario Road. If the Preferred Alternative west option (including the CAP Design Option) is chosen in Tier 2, ADOT will further study relocation of Sandario Road to coincide with the new I-11 alignment. ADOT will remove and reclaim an approximately 2-mile section of the existing road with native vegetation. The design would reduce barriers for wildlife (including the road and associated roadway fencing) while maintaining necessary local access.	Mitigation	Sahuarita to Marana
MM-Section 4(f)-3	Co-align wildlife crossings with CAP canal wildlife crossings. If the Preferred Alternative west option is chosen in Tier 2, ADOT will study placement of wildlife crossings on I-11 that align with the six existing CAP siphon crossings in the Tucson Mitigation Corridor and would place one wildlife crossing immediately north of the Tucson Mitigation Corridor (a total of seven crossings). The purpose of the I-11 wildlife crossings is to provide continuity to the existing CAP wildlife crossings (siphons) and minimize impacts to wildlife movements between the Tucson Mountains and Roskrige Mountains.	Mitigation	Sahuarita to Marana
MM-Section 4(f)-4	Provide no interchanges between West Snyder Hill Road and West Manville Road. To maximize the effectiveness of the Tucson Mitigation Corridor mitigation measures, ADOT will not build exits or interchanges on I-11 between West Snyder Hill Road and West Manville Road if the Preferred Alternative west option is chosen in Tier 2. The distance between these two roads is approximately 9 miles.	Mitigation	Sahuarita to Marana



Number	Commitment	Type	Geography
MM-Section 4(f)-5	Minimize width of I-11 in Tucson Mitigation Corridor. If the Preferred Alternative west option is chosen in Tier 2, ADOT will minimize the width of I-11 through the Tucson Mitigation Corridor using appropriate interstate design standards.	Mitigation	Sahuarita to Marana
MM-Section 4(f)-6	Partner with land use planning organizations and agencies. Understanding the potential for indirect and cumulative land use effects that could occur if the Preferred Alternative west option is chosen in Tier 2, ADOT will be an active partner in a broader effort with metropolitan planning organizations, local jurisdictions, resource agencies, and private stakeholders to cooperatively plan development in the I-11 Corridor. The effort would coordinate wildlife connectivity, local land use planning, and context-sensitive design for the I-11 facility. The White Tank Mountains Conservancy may be a model for this type of effort. Coordination with Pima County on the implementation of the Sonoran Desert Conservation Plan also could be part of the effort.	Mitigation	Sahuarita to Marana
MM-Section 4(f)-7	Apply design standards. The Bureau of Reclamation and the Central Arizona Water Conservation District have design standards for facilities that encroach on CAP lands. ADOT will comply with these standards where I-11 crosses CAP lands or is adjacent to the CAP facility.	Mitigation	Corridor-Wide
MM-Section 4(f)-8	Comply with dark skies objectives. Roadway lighting will be compatible with dark skies objectives and lighting would be limited to be consistent with land use and development patterns at the time of the I-11 Corridor implementation.	Mitigation	Corridor-Wide
MM-Section 4(f)-9	Visually screen the Project. If the Preferred Alternative west option is chosen in Tier 2, the roadway will be designed in such a way as to screen the facility from sensitive viewpoints in the area. The design will use various measures, such as vegetation, berms, and topography or partial depression of the roadway, to accomplish this. The screening also could reduce noise impacts.	Mitigation	Sahuarita to Marana



Number	Commitment	Type	Geography
MM-Section 4(f)-10	Undertake wildlife studies and create or enhance wildlife corridor(s). ADOT will coordinate with AGFD and USFWS, as recognized wildlife authorities, on determining the studies required to understand east-west wildlife movement needs (both on and off the Tucson Mitigation Corridor) between the Tucson Mountains and the Roskrige Mountains. ADOT will undertake and use the results of the wildlife studies, in consultation with AGFD, USFWS, and the Tucson Mitigation Corridor Working Group, to develop specific mitigation measures that will be incorporated into the I-11 Corridor. Mitigation measures may include creation of new or enhancement of existing wildlife corridor(s) on or outside the Tucson Mitigation Corridor property, but would be located between the Tucson Mountains to the east and the Roskrige Mountains to the west, and they would support the purpose of the Tucson Mitigation Corridor. These studies will gather baseline wildlife data, including evaluation of historical and current movement data, and surveys of existing populations. Using the baseline data, the studies will identify the extent, location, requirements, target species, and expected benefits of additional and enhanced wildlife movement corridors, supporting structures, and other mitigation measures. The wildlife studies will identify adaptive management thresholds and likely actions. ADOT will fund and facilitate the implementation of the identified wildlife studies in Tier 2 so that the results can be used to inform the I-11 Corridor design.	Mitigation	Sahuarita to Marana
MM-Section 4(f)-11	Replace or compensate for any land in the Tucson Mitigation Corridor acquired for I-11 by considering comparable value and function, restoration of land value, and preservation of land. If the Preferred Alternative west option requires acquisition of Tucson Mitigation Corridor land, ADOT will assess the feasibility of transferring land acquired for Tucson Mitigation Corridor mitigation to an entity that would protect the lands for wildlife and wildlife movement purposes. ADOT will consult with the Tucson Mitigation Corridor partners to jointly identify and agree on the appropriate entity.	Mitigation	Sahuarita to Marana
MM-Section 4(f)-12	Avoid the use of specific properties that are partially or entirely within the Build Corridor Alternatives. The properties are identified in the Preliminary Section 4(f) Evaluation and can be avoided by accommodation, shifting the corridor, or grade-separating the corridor.	Mitigation	Corridor-Wide



Number	Commitment	Type	Geography
MM-Section 4(f)-13	Commit to Tier 2 studies, during which the selected Build Corridor Alternative will be refined to a specific roadway alignment, potential impacts and uses as defined by Section 4(f) will be identified, measures to avoid or minimize impacts to Section 4(f) properties will be identified and assessed, measures to mitigate adverse impacts to Section 4(f) properties will be identified, and a Final Section 4(f) Evaluation will be completed, prior to making a final Section 4(f) approval.	Mitigation	Corridor-Wide

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