APPENDIX H
ENVIRONMENTAL OVERVIEW

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Environmental Overview Technical Memorandum Update

Interstate 10,
Junction Interstate 19 to State Route 83

and

State Route 210,
Golf Links Road to Interstate 10
Feasibility Study

ADOT No. 010 PM 260 H7825 01L
Federal No. 010-E(210)A

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November 10, 2014

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ENVIRONMENTAL OVERVIEW

I. INTRODUCTION

This Environmental Overview (EO) describes the existing environment, including social, economic, and natural resources, and identifies potential environmental issues associated with planned improvements to Interstate 10 (I-10) and the extension of State Route (SR) 210, also known as the Barraza-Aviation Parkway, in Pima County, Tucson, Arizona (Figure 1). This EO is not intended to satisfy compliance with the National Environmental Policy Act (NEPA) but is meant to identify, early in the planning process, those issues, constraints, and opportunities that should be considered in the preliminary analysis of alternatives. Information presented in this document is based on an existing records review, coordination with local jurisdictions and regulatory agencies, and limited field review. This EO was updated to expand the analysis of one of the alternatives previously considered and to add a new alternative for consideration. Future analyses will address environmental considerations in more detail.

This EO was conducted in concert with the *I-10, Junction I-19 to SR 83 and SR 210, Golf Links Road to Interstate 10 Feasibility Study Update* (Arizona Department of Transportation [ADOT] 2014), which examined the traffic demands and operational and engineering considerations of project development. Improvements to I-10 and SR 210 in the study area have been a goal of ADOT, the City of Tucson, Pima County, and the Pima Association of Governments (PAG) since 2003. The extension of SR 210 is under consideration to improve mobility and operations of I-10 into the downtown Tucson area. Because the operations of I-10 and SR 210 are interdependent in this area, one roadway cannot reasonably be studied without consideration of the other. The Feasibility Study and EO assume the proposed SR 210 extension to a connection to I-10 in southeast Tucson would occur.

The two corridors are being addressed together due to the linked mobility and operational goals of improving I-10 service into downtown Tucson. Traffic analysis studies prepared in support of the Feasibility Study confirm the linked relationship between the two corridors. Throughout the EO, the term "study area" refers to the combined I-10 and SR 210 study corridors, which overlap roughly from I-10/Palo Verde Road to I-10/Rita Road. The term "study corridor" is used to refer to the specific I-10 or SR 210 corridor. Potential issues, concerns, or opportunities related to each highway are discussed separately in the EO. Preparation of a Design Concept Report (DCR)/ NEPA document (i.e., Environmental Assessment [EA] or Environmental Impact Statement [EIS]) would constitute the next phase of study if the project proponents decide to proceed with project development. Throughout the remainder of the document, this next phase of study will be referred to as the DCR/NEPA phase.

A. Project Need

The interstate highway system was intended to relieve congestion, improve safety, and enhance the economy—facilitating the movement of goods and people throughout the nation. Increasing traffic volumes on I-10 in Tucson have contributed to a reduction in operational effectiveness, particularly the segment between Interstate 19 (I-19) and SR 83. With multiple access points to I-10 in close proximity, many local trips use the interstate, contributing to traffic congestion and further compounding the problem.

Figure 1. Project vicinity

Most of the traffic interchanges (TIs) were designed 25 to 40 years ago and have operational limitations. The Level of Service (LOS) on I-10 in the coming years is expected to degrade based on capacity limitations and operational inefficiencies of the TIs. Without improvements, I-10 performance will reach an unacceptable LOS in the study area.

Subsequent to the construction of I-10, SR 210 was built as an urban highway and business spur. Currently, I-10 motorists have no direct access to downtown Tucson via SR 210. Therefore, motorists must use an indirect route and are more likely to remain on I-10 longer, causing increased traffic volumes and congestion. Adding a connection between I-10 and SR 210 in southeast Tucson would facilitate the use of SR 210 as a business spur, providing local downtown traffic with a desirable alternative to I-10, offloading traffic, and thereby improving traffic operations on I-10.

The study area for the Feasibility Study and the EO falls within the city of South Tucson, the city of Tucson, and unincorporated Pima County (Figure 2). The I-10 study corridor begins at the junction of I-19/I-10 at milepost (MP) 260.2 and continues east to SR 83 at MP 282.0. The existing SR 210 is about 4 miles long and is oriented northwest–southeast from Broadway Road in downtown Tucson to Alvernon Way/Golf Links Road near Davis-Monthan Air Force Base (DMAFB). The SR 210 study corridor begins at MP 4.0 (Golf Links Road) and extends south to I-10 and east along I-10 to MP 274.0 (approximately 1.25 miles west of Houghton Road).

The Feasibility Study focused on the existing I-10 corridor; no new I-10 alignments or bypass segments were considered. Potential improvements to I-10 included adding travel lanes, frontage roads, and interchange access ramps, and reconfiguring existing TIs. The I-10 study corridor width is approximately 0.25 mile on each side of I-10. All Feasibility Study improvement concepts fell within the boundaries of this study corridor.

The SR 210 alignment extensions are constrained by the DMAFB and the Union Pacific Railroad (UPRR) on the north and by I-10 on the south. The study corridor generally parallels Palo Verde Road in its north–south segment (western end of study corridor) and is between DMAFB and I-10 in its east–west segment (Figure 2). With the exception of short segments for three alternatives, as discussed in the following section, the Feasibility Study improvement concepts fell within the boundaries of this study corridor.

B. Alternatives

This EO focuses on the roadway improvement alternatives addressed in the Feasibility Study. The study evaluated I-10 mainline improvements and I-10 TI improvements and developed multiple alternative scenarios for the extension of SR 210 and its connection to I-10. The SR 210 extension scenarios are referred to as "system alternatives," or Systems I, II, III, and IV. The System III scenarios included subalternatives referred to as Systems IIIa, IIIb, and IIIc.

The System I, II, and IIIc alternatives were carried forward for further analysis in the 2012 EO. The System III, IIIa, and IIIb alternatives were eliminated from further consideration in the Feasibility Study based on engineering issues and potential social, economic, and environmental impacts identified early in the process. The System IV alternative was identified subsequent to the 2012 EO and incorporated into the updated Feasibility Study and EO.

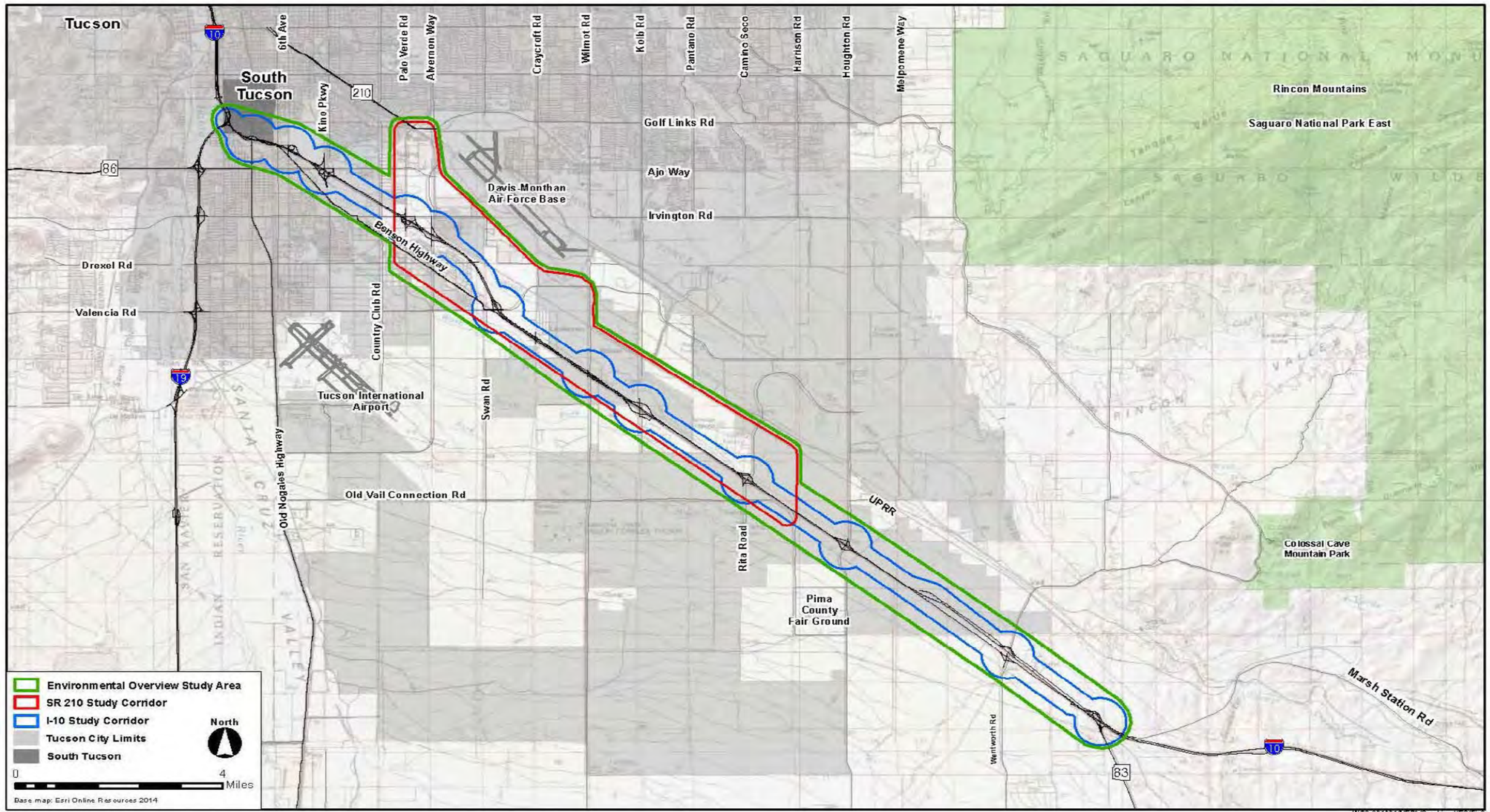

Figure 2. Project location

This EO documents known environmental considerations of the system alternatives carried forward for further analysis; Systems III, IIIa, IIIb, and IIIc are referenced to document the rationale used in the decision-making process to not carry them forward.

The following sections describe the alternatives evaluated in this EO: the SR 210 system alternatives, the I-10 mainline improvements, and the I-10 TI improvements. More detailed alignment and interchange design configurations are included in the Feasibility Study.

1. System Alternatives

The system alternatives involve the extension of SR 210 and its connection to I-10. The proposed alignments and point of connection represent the basic differences among the system alternatives. The analysis completed for the SR 210 extension identified and evaluated these alignments, which are shown in Figures 3a, 3b, and 3c.

During the preliminary screening stage of the Feasibility Study, several alternatives for relocating the I-10/SR 210 connection to a point east of Wilmot Road were investigated. However, projected I-10 traffic data for design year 2040 indicated that only marginal I-10 traffic improvements would be gained if the I-10/SR 210 connection was located east of Wilmot Road. Therefore, these connection alternatives were eliminated from further consideration.

a. System I Alternative

Under the System I alternative (Figure 3a), SR 210 would be extended south, generally along Alvernon Way, to intersect I-10 at the existing Alvernon Way TI. The TI would be reconfigured to accommodate this connection. With this alternative, the new SR 210 would cross Ajo Way on a new grade-separated TI. The length of this new roadway would be about 2.5 miles. The new roadway would replace the existing Alvernon Way. New connections at Alvernon Way, Golf Links Road, and Palo Verde Road would occur. A new grade-separated diamond interchange with Ajo Way would be added, and SR 210 would be elevated over the UPRR and Irvington Road. Local access would change because no direct access would occur off the SR 210 extension.

New right-of-way (ROW) would be required from a triangular area of commercial/industrial property bounded by the UPRR, Golf Links Road, and 34th Street, from commercial property in the southwest quadrant of Irvington Road and Alvernon Way, and along Alvernon Way to accommodate a freeway cross-section.

b. System II Alternative

Under the System II alternative (Figure 3a), SR 210 would be extended diagonally southeast, roughly following the DMAFB property line to Swan Road. At Swan Road, the alignment would turn south to connect with I-10 just west of the existing Valencia Road TI, which would be reconfigured. With this alternative, new SR 210 connections to Golf Links Road and Alvernon Way would be reconfigured through a series of ramps where the current connections are made. SR 210 would be depressed under Alvernon Way to the south and remain partially depressed along the DMAFB boundary to Swan Road. The new SR 210 would be grade-separated over Irvington Road as well as over the UPRR and Tucson Electric Power (TEP) railroad spur. This alignment would be about 3.5 miles long.

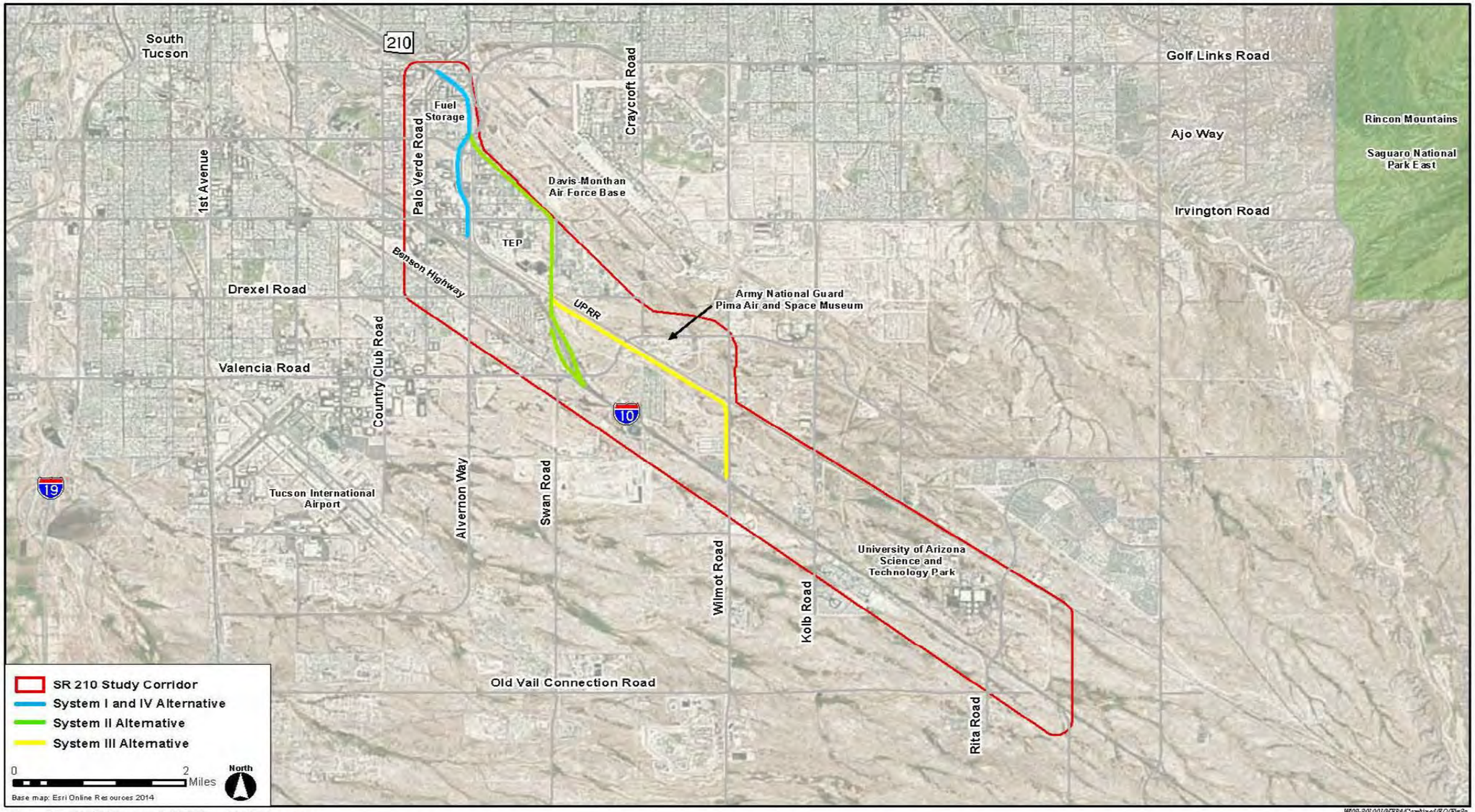

Figure 3a. SR 210 System I, II, III, and IV alternatives

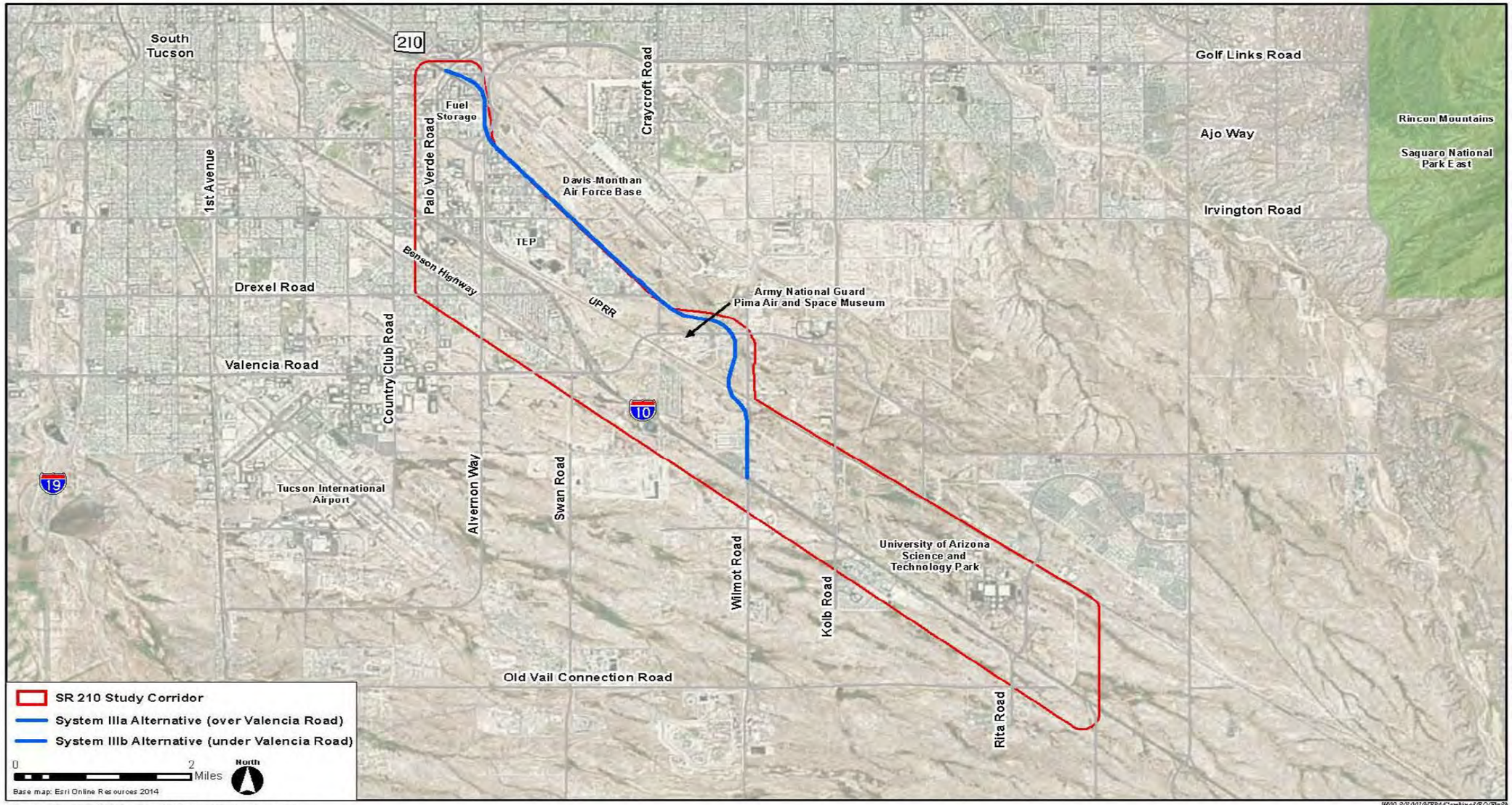

Figure 3b. SR 210 System IIIa and IIIb alternatives

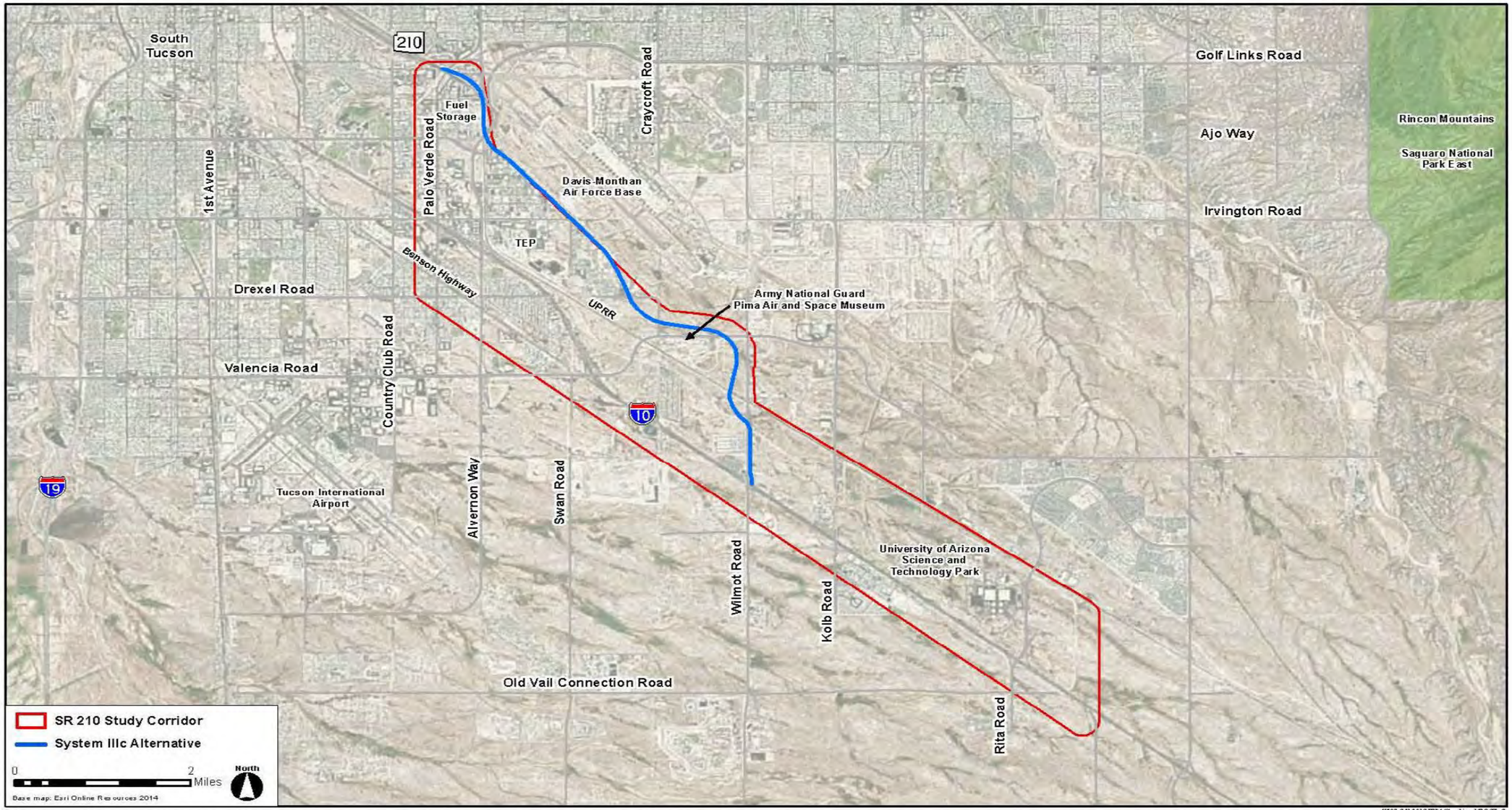

Figure 3c. SR 210 System IIIc alternative

New ROW in the same triangular commercial/industrial area noted with System I would be required. From just south of the triangular area to Swan Road, new ROW would be required from mostly commercial/industrial properties. Some roadway ROW exists on Swan Road; however, new ROW would be needed to extend the alignment south to I-10.

c. System III Alternatives

The original System III alternative (Figure 3a) would begin along the same alignment as System II and would share the same features through the grade-separated crossing of the UPRR. After crossing the UPRR, the alignment would head east parallel to, and along the south side of, the railroad to Wilmot Road. A new diamond interchange with Valencia Road would occur west of Craycroft Road. The alignment would cross over Wilmot Road, parallel the road on the east side, and then proceed south to connect to I-10.

This alternative would require the reconfiguration of the existing Wilmot Road/I-10 tight diamond TI. The existing Wilmot Road would remain for local access. This alignment would be almost 7.5 miles long and would impact a 100-year floodplain, would be in close proximity to two public schools, and would pose a potential environmental justice issue related to the community of Littletown. System III would also directly impact a Pima County regional park, a Section 4(f) resource. If federal funding was used to construct the SR 210 extension, Section 4(f) of the Department of Transportation Act of 1966 would apply. As discussed in Section II.A.8, the use of park resources for project construction would not likely be approved by the Federal Highway Administration (FHWA). For these reasons, System III was eliminated from further consideration.

Variations of System III, referred to as Systems IIIa and IIIb (Figure 3b) were then developed to avoid the regional park by keeping the SR 210 alignment north of the UPRR and adjacent to the DMAFB from Swan Road to Valencia Road. To provide an adequate intersection at Valencia Road, the SR 210 alignment would cross a corner of the DMAFB property under both system alternatives. The only difference between Systems IIIa and IIIb would occur at the crossing of Valencia Road: System IIIa would cross over Valencia Road and System IIIb would cross beneath the road. Both alternatives would connect to I-10 at Wilmot Road.

Challenges were identified for Systems IIIa and IIIb, including ROW acquisition from the DMAFB; encroachment on the DMAFB Aircraft Clear Zone, Accident Potential Zone, and Approach-Departure Corridor; and geometric/operational issues at Valencia Road. For these reasons, Systems IIIa and IIIb were eliminated from further consideration.

Through coordination with PAG and the Pima County Department of Transportation, it was determined that an I-10/SR 210 connection option at Wilmot Road was important to consider, resulting in the evaluation of a System IIIc alternative (Figure 3c). This alternative modified Systems IIIa and IIIb to reduce potential conflicts with DMAFB operations. Under System IIIc, the portion of the SR 210 alignment adjacent to the DMAFB would be depressed and would then shift away from the DMAFB boundary at Drexel Road to provide a setback or buffer from a runway hazardous object pad (munitions storage area). The alternative would cross under Valencia Road and remain west of Wilmot Road until approximately Julian Wash, then cross to the east side of Wilmot Road and continue to the I-10 connection.

The System IIIc alignment would conflict with the DMAFB Approach-Departure Corridor and with potential hazardous materials sites and would pose DMAFB security concerns. Coordination with DMAFB indicated an agreement to further consideration of System IIIc through the DCR phase. However, upon further analysis of operational, cost, and environmental impact factors, the System IIIc alternative was eliminated. The unconventional alignment, extended depressed roadway segment, floodplain impacts, DMAFB Aircraft Approach/Departure conflicts, and high cost ruled out this alternative from further consideration in the DCR/NEPA phase.

d. System IV Alternative

The System IV alternative is an improvement of I-10 from the I-10/I-19 TI easterly through the SR 83 TI and the extension of SR 210 south along the Alvernon Way alignment to I-10. This alternative features collector-distributor (CD) roadways adjacent to both the eastbound and westbound I-10 mainline roadway from Alvernon Way easterly through the Kolb Road TI. The adjacent CD roadways provide an expanded frontage road system to handle local destination traffic and the mainline freeway with limited access points for through traffic.

An I-10/SR 210 system interchange will provide access between SR 210 and the eastbound and westbound I-10 CD roadways and will be integrated with the diamond interchange at the junction of Alvernon Way and I-10. The connection at SR 210 shares the same configuration as Alternative I from Golf Links Road to I-10. This alternative allows direct free-flow connections from I-10 to SR 210 at the Alvernon Way TI. Access points to CD roadways will occur at Valencia Road, Craycroft Road, Wilmot Road, and Kolb Road.

Additional ROW will be required for SR 210, the SR 210/Golf Links TI, the Ajo Way TI, and the I-10/SR 210 system interchange. Because of the additional width of the CD roadways along I-10, some additional ROW may be required along I-10.

2. I-10 Mainline Improvements

The need for improvements to the I-10 mainline relates to the capacity to carry the projected 2040 design year traffic demand. Based on current PAG projections for the region, population is expected to be about 1.4 million in 2040, a reduction from the previous projection of 1.8 million (Pima County 2014a). The current 2014 population in the region is just over 1 million. The traffic demand for I-10 was determined in the Feasibility Study based on population growth, and traffic studies of travel patterns, including origins and destinations of motorists. Adding lanes to I-10 would be a typical means to achieve an adequate LOS of D or better. LOS is a measure of traffic operations ranging from LOS A, representing optimal free-flow conditions, to LOS F, representing considerable congestion and delay (Figure 4). I-10 currently ranges from two to three lanes in each direction.

To meet the LOS goal, I-10 widening is under consideration. The ultimate width after widening would range from two to five lanes in each direction depending on the section of I-10, noted as follows and depicted in Figure 5:

- I-19 to future SR 210 System TI—three or four lanes in each direction
- Future SR 210 System TI to Kolb Road—five lanes in each direction

• Kolb Road to Houghton Road—four lanes in each direction

Level of Service A

Level of Service B

Level of Service C

Level of Service D

Level of Service E

Level of Service F

Figure 4. Levels of service

Figure 5. I-10 proposed improvements

- Houghton Road to Wentworth Road—three lanes in each direction
- Wentworth Road to SR 83—two lanes in each direction

Other mainline I-10 improvements include:

- Adding auxiliary lanes between successive entrance and exit ramps
- Widening into the median from Park Avenue to a point approximately 7,000 feet east of Kolb Road while maintaining an open median to the east
- Replacing structures and pavement, as needed
- Updating pavement drainage and lighting systems
- Modifying existing interchanges and/or ramps to improve safety
- With the System IV alternative, the interstate frontage roads would be expanded to two and three lanes in each direction to provide improved local street access

3. *I-10 Interchange Improvements*

a. Interchange Spacing

Three of the I-10 interchanges in the study corridor do not meet nominal intersection spacing (at least 1 mile between intersections):

- Park Avenue TI—0.7 mile from the 6th Avenue and the Kino Parkway TIs
- Palo Verde Road TI—0.6 mile from Alvernon Way TI
- Craycroft Road TI—0.85 mile from Valencia Road TI

Elimination of the Palo Verde Road TI is under consideration. A new interchange at Country Club Road is being proposed to provide access to I-10 between Kino Parkway and Alvernon Way. Because of the need for access to businesses and government services, the Park Avenue and Craycroft Road TIs were not considered for elimination.

b. Interchange Functionality

To improve the functional operation of I-10 and its crossroads, modifications to the existing TIs were considered in the Feasibility Study. These modifications are described by interchange as follows and depicted in Figure 5. The modifications described are preliminary. During the DCR/NEPA phase of the process, these concepts may be refined or revised.

i. I-10/I-19 System TI

At the I-10/I-19 TI, existing I-10 is three lanes in each direction and has physical constraints that would restrict its widening within the interchange to four lanes in each direction. As noted in the Feasibility Study, the two additional lanes could be accommodated within the 29th Street entrance and exit ramps and frontage road system. These improvements would require widening the existing I-10 bridge over 10th Avenue and lowering the profile of 10th Avenue to maintain the minimum required vertical clearance. No new ROW is required with this modification.

ii. I-10/6th Avenue TI

The existing diamond interchange at 6th Avenue could be retained. Additional lanes on the 6th Avenue crossroad would be needed. The existing two eastbound ramps and the westbound entrance ramp would not require major improvements. The westbound exit ramp would be relocated to the east side of Park Avenue and would cross over the exit ramp to Park Avenue on a grade-separated structure. The westbound frontage road would be shifted north to accommodate westbound widening to the outside. New ROW would be required for the shifted frontage road and for a portion of the relocated exit ramp.

iii. I-10/Park Avenue TI

The existing partial cloverleaf-type interchange at Park Avenue could be converted to a standard diamond interchange by removing the westbound loop entrance ramp and replacing it with a standard ramp west of Park Avenue. An additional northbound lane would be created by restriping the pavement, without having to widen the roadway. The eastbound exit ramp would be extended to the Park Avenue crossroad; this may require the acquisition of the motel in the southwest quadrant of the interchange.

iv. I-10/Kino Parkway TI

The existing partial cloverleaf-type interchange at Kino Parkway could be converted to a standard diamond interchange. Because of heavy volumes of southbound to eastbound movement, the loop ramp in the southwest quadrant would be retained. Direct access from westbound I-10 to Ajo Way would be removed. The interchange reconfiguration would require the acquisition of new ROW and the disposal of excess ROW. Widening of the crossroad is required within the interchange.

v. I-10/Country Club Road TI

A new diamond interchange could be constructed at Country Club Road to replace the Palo Verde Road TI. New ROW would be required in all four quadrants, especially in the southwest quadrant. The crossroad would be widened substantially, thus requiring new ROW.

vi. I-10/Palo Verde Road TI

The existing partial cloverleaf interchange at Palo Verde Road, which is too close to the Alvernon Way TI, could be removed and excess ROW made available for sale.

vii. I-10/Alvernon Way TI

The existing partial diamond interchange at Alvernon Way could remain but would be modified. A westbound entrance ramp would be added, requiring new ROW. The westbound exit ramp would be reconfigured to provide access to southbound Alvernon Way. The eastbound exit ramp would be reconfigured to improve the skew angle at the crossroad, requiring new ROW. The construction of additional lanes on the crossroad would require new ROW to match the existing lanes. A Pima County Regional Transportation Plan project to widen Alvernon Way may precede this project.

viii. I-10/SR 210 System TI Alternatives

Systems I and IV: Under the System I and IV alternatives, SR 210 could be extended along the Alvernon Way alignment. Improvements to the existing diamond TI and crossroad, discussed previously, would be performed. The new system-to-system TI would be placed on top of the existing diamond TI and would involve four new directional ramps. Two of the new ramps for the south-to-east and south-to-west movements would require new ROW from commercial property, affecting several buildings. The east-to-north ramp would require new ROW from vacant property. The design and operation of the I-10/SR 210 TI will be further refined during the DCR/NEPA phase.

System II: Under the System II alternative, SR 210 could be extended to tie to I-10 at a point approximately 0.5 mile west of Valencia Road. The new system-to-system TI would involve four new directional ramps, requiring new ROW for all four ramps. The SR 210 mainline and the south-to-west ramp would cross over the UPRR and the TEP spur railroad tracks. Eastbound exit ramps and westbound entrance ramps from Valencia Road and Craycroft Road would extend into the interchanges to provide connections to I-10 and SR 210. The design and operation of the I-10/SR 210 TI will be further refined during the DCR/NEPA phase.

ix. I-10/Valencia Road TI

The existing diamond interchange at Valencia Road could be retained. Additional lanes on the crossroad are needed. The need for new ROW is not anticipated.

x. I-10/Craycroft Road TI

The existing tight diamond interchange at Craycroft Road could be retained. The westbound exit ramp would be realigned to improve the skew angle at the crossroad. The eastbound exit ramp would diverge from I-10 north of Valencia Road and roughly follow the alignment of the existing eastbound frontage road, which would be removed. The westbound entrance ramp would roughly follow the alignment of the existing westbound frontage road, which would be removed. The ramp would merge with I-10 west of Valencia Road. New ROW would be required for these three ramps. Minor widening of the crossroad would occur and may require new ROW.

xi. I-10/Wilmot Road TI

The existing tight diamond-type interchange at Wilmot Road could be retained under the System I and II alternatives. All ramps would be realigned to improve the skew angles at the crossroad. New ROW would be required in the northeast and southwest quadrants. Both parcels are undeveloped. Widening of the crossroad would require new ROW. As noted earlier, this interchange would be reconfigured under System IIIc.

xii. I-10/Kolb Road TI

The existing spread diamond-type interchange at Kolb Road could be converted to a platform diamond interchange. With this configuration, I-10 would remain at ground level, and Kolb Road would be two levels above I-10. Both carry only through traffic. Turning movements are restricted to roadways in the middle level—the "platform." Therefore, the turning movements do not interfere with the through movements. All ramps that connect to the platform would be standard diamond ramps. A new south connector road would be required to improve access to

the existing two-way frontage road east of Kolb Road along the south side of I-10. It would intersect with the two platform ramps but pass under Kolb Road. Under this concept, new ROW would be needed, but excess ROW could be made available for sale.

xiii. I-10/Rita Road TI

The existing spread diamond-type interchange at Rita Road could be converted to a standard diamond interchange. Ramps would be realigned to improve skew angles at the crossroad. New ROW would be needed, but excess ROW could be made available for sale.

xiv. I-10/Houghton Road TI

The existing spread diamond interchange at Houghton Road could be converted to a diverging diamond interchange. Ramps would be realigned to improve skew angles at the crossroad. New ROW would be needed, but excess ROW could be made available for sale. Pima County has requested that Houghton Road be realigned to roughly follow the section line. Pima County and the City of Tucson are designing Houghton Road improvements from the UPRR to I-10. The results of that design and realignment of Houghton Road south of I-10 to the section line will be evaluated in the DCR/NEPA phase. To accelerate the construction of a new interchange to match the Houghton Road improvements, ADOT may choose to advance the planning phase for this interchange in a separate DCR/NEPA document.

xv. I-10/Wentworth Road TI

The existing spread diamond-type interchange at Wentworth Road could be retained. Wentworth Road would be realigned to improve skew angles with I-10 and the ramps. Major ramp realignment with subsequent ROW acquisition is needed for the eastbound exit ramp. Some new ROW is needed for the two entrance ramps. The realignment of Wentworth Road would require new ROW and tapers to match existing lanes. The final realignment of Wentworth Road would be determined during the DCR/NEPA phase.

xvi. I-10/SR 83 TI

The existing trumpet interchange at SR 83 could be converted to a standard diamond interchange. The new ramps would be aligned to improve skew angles at the crossroad. The two-way frontage road in the southwest quadrant would be shifted to provide proper offset from eastbound I-10, requiring new ROW. The frontage road would also be extended to tie into SR 83 opposite the Old SR 83 roadway to create a new intersection. Realignment of the frontage road would require new ROW. The crossroad would be extended to the north; the extent would be determined during the DCR/NEPA phase. For the new ramps, some new ROW would be required, and some excess ROW would result from the reconfiguration.

II. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONCERNS

Based on a review of available information, no prime or unique farmlands, wetlands, wilderness areas, or wild and scenic rivers are present in the study area. Therefore, these items are not discussed further in this EO. This section describes the affected environment for the overall study area and the environmental concerns for each study corridor by resource topic. The SR 210 environmental concerns sections discuss each system alternative individually, as warranted.

Recommendations for additional analysis and coordination are identified in the Environmental Concerns sections throughout this document.

A. Physical and Natural Environment

1. *Topography/Physiography*

a. Affected Environment

The study area lies between 2,410 and 3,440 feet elevation[1] on relatively flat to gently rolling terrain in the eastern Santa Cruz River Valley. The south-to-north-flowing Santa Cruz River is approximately 0.75 mile west of the I-19/I-10 interchange. The drainages in the study area flow roughly southeast to northwest and are ephemeral, eventually combining with Julian Wash, which joins the Tucson Diversion Channel before entering the Santa Cruz River west of the I-10/I-19 junction. The following five named washes are in the study area:

- Julian Wash, which parallels I-10 from roughly Kolb Road until crossing under I-10 west of the Swan Road alignment (much of the wash is channelized from Wilmot Road west to the Santa Cruz River)
- Earp Wash, which is just south of the Benson Highway and does not cross I-10
- Pima Air Museum Wash, which is a tributary of Julian Wash, converges near Craycroft Road and Valencia Road
- North Fork Airport Wash, which is south of I-10 east of Wilmot Road
- Franco Wash Tributary, which crosses I-10 at MP 278 (west of Vail Road/Wentworth Road)

Several other unnamed washes are in the study area.

The terrain in the study area generally is flat to gently sloping downward to the northwest. Nearby mountain ranges have steeper, more rugged, rocky terrain, including the Tucson Mountains, rising to 4,267 feet west of the Santa Cruz River, approximately 1.5 miles west of the study area; the Rincon Mountains, with foothills extending approximately 3 miles northeast of the study area and rising as high as 8,664 feet; and the Santa Rita Mountains, whose northern extension is approximately 4.5 miles southeast of the study area, with a maximum elevation of 9,453 feet.

Soils in the study area are of the Nickel-Latene-Cave Association. These are well-drained, deep and shallow, limy and gravelly, medium and moderately coarse-textured soils on nearly level to steep soils on dissected alluvial fan and terrace escarpments. These soils formed in calcareous old alluvium derived from igneous and sedimentary rocks (Hendricks 1985).

b. Environmental Concerns and Recommendations for Further Analysis

i. <u>I-10 (Junction I-19 to SR 83)</u>

Improvements in the I-10 study corridor would not be precluded by existing topography, landform, geologic features, soil, or drainages, nor would the character of the landform features be substantively altered by I-10 improvements. Minor cut/fill slopes would be expected at several locations between Houghton Road and SR 83. An analysis of drainage needs would occur during the DCR/NEPA phase. It is expected that drainage pipes or culverts would accommodate cross-drainage. A geotechnical evaluation of soils would be expected during design to determine pavement, slope protection, and interchange-bridge structural needs.

ii. <u>SR 210 (Golf Links Road to I-10)</u>

Construction of the SR 210 alternatives would not be precluded by topography, landform, geologic features, soil, or drainages, nor would the character of the landform features be substantively altered by the alternatives. An analysis of drainage needs for each alternative would occur during the DCR/NEPA phase. A geotechnical evaluation of soils would be needed during design.

2. *Vegetation*

a. Affected Environment

The majority of the study area lies within the creosote bush *(Larrea tridentata)*–dominated Arizona Upland subdivision of Sonoran desertscrub (Turner and Brown 1994). The western end of the study area is predominately urban and highly developed; therefore, native vegetation is limited to scattered patches of undeveloped terrain. Landscaping within the ADOT ROW occurs from I-19 to Park Avenue and features native or desert adaptable plants. East of Park Avenue, naturally established native plants within the ROW and on adjacent undeveloped parcels are more abundant. From Kolb Road east to SR 83, the majority of the unpaved I-10 ROW and adjacent lands are vegetated with Sonoran desertscrub species. Large, continuous remnant areas of natural vegetation are present in the study area east of Swan Road.

In the study area where natural plant communities still exist, the plant community varies in diversity from areas containing almost exclusively creosote bush to areas with much higher plant diversity, such as ephemeral drainages or areas with rocky soils and rolling terrain where cacti are prevalent. Other plants in the study area include blue paloverde *(Parkinsonia florida)*, foothill paloverde *(Parkinsonia microphylla)*, velvet mesquite *(Prosopis velutina)*, desertbroom *(Baccharis sarothroides)*, burroweed *(Isocoma tenuisecta)*, cholla (*Cylindropuntia* spp.), pricklypear (*Opuntia* spp.), candy barrel cactus *(Ferocactus wislizeni)*, triangle bursage *(Ambrosia deltoidea)*, fourwing saltbush *(Atriplex canescens)*, and spiny hackberry *(Celtis ehrenbergiana)*. Native grasses include purple threeawn *(Aristida purpurea)*, sideoats grama *(Bouteloua curtipendula)*, and alkali sacaton *(Sporobolus airoides)*. The introduced buffelgrass *(Pennisetum ciliare)* is often abundant within the disturbed ROW and median. Along xeroriparian drainages adjacent to and crossing the roadway, the plant community tends to be of higher density, with a greater representation of tree and shrub species.

The eastern half of the study area from approximately Rita Road to SR 83 falls within the *City of Tucson Greater Southlands Habitat Conservation Plan* (HCP) (City of Tucson 2006) and the *Pima County Multi-species Conservation Plan: Administrative Draft* (MSCP) (Pima County 2010). These plans were developed in conformance with Section 10 of the Endangered Species Act for an Incidental Take Permit of protected plant and animal species. Additional discussion of these plans is located in Section II.A.3, Biology. The HCP and MSCP areas are included within the broader *Pima County Sonoran Desert Conservation Plan* (SDCP) (Pima County 2014b). The SDCP identifies a broad area generally between the Rincon Mountains and the Santa Rita Mountains as a Biological Core and Multi-Use area (Figure 6).

[1] Elevations in this document are referenced to mean sea level.

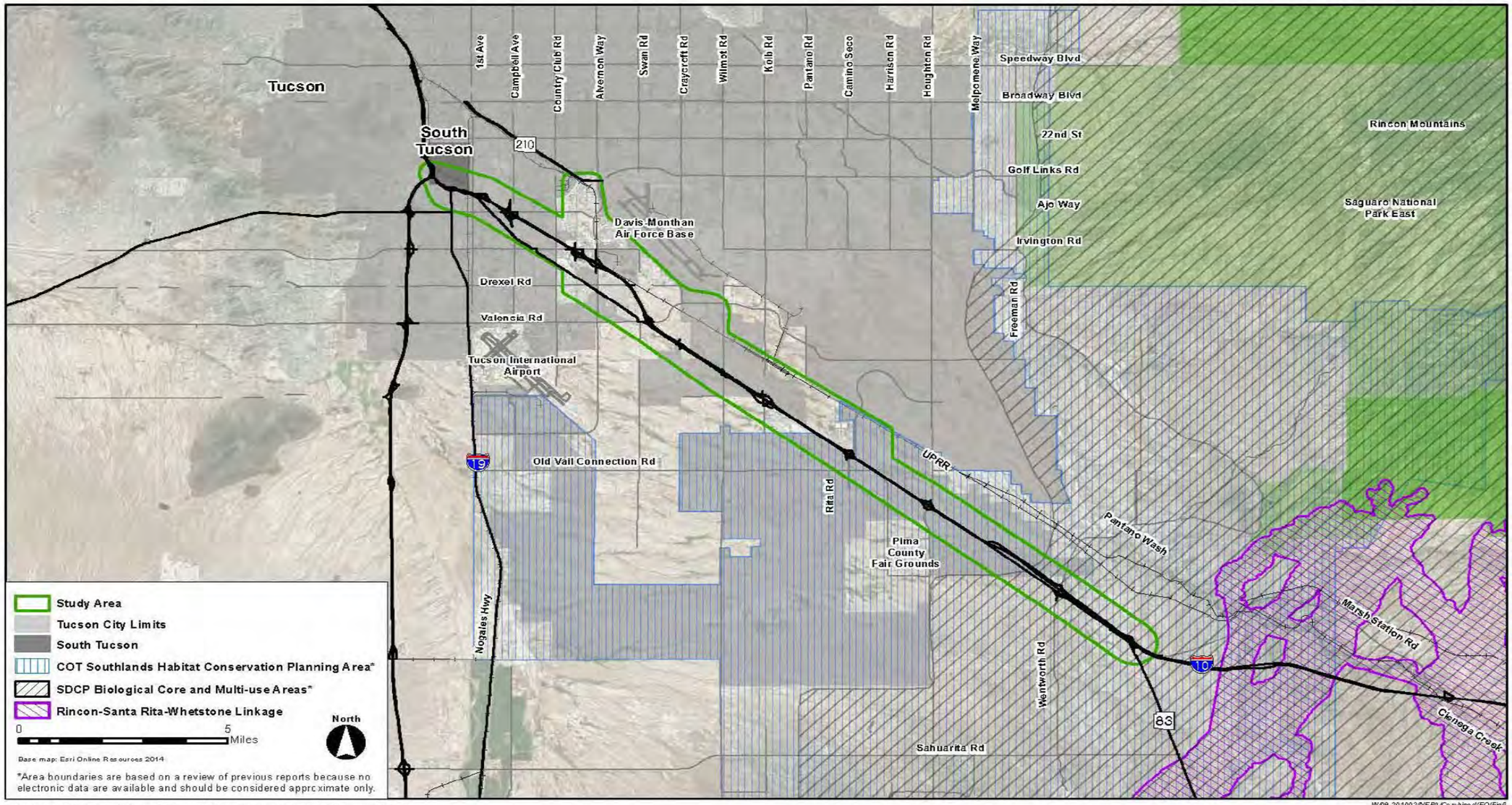

Figure 6. Conservation plans, wildlife movement corridors, and linkages

W:\09-301002\NEPA\Combined\EO\Fig6

The plans identify these areas due to the large generally undeveloped blocks of land and intact native vegetation. The goal of the plans, as stated in the MSCP (Pima County 2010), is to "ensure the long-term survival of the full spectrum of plants and animals that are indigenous to Pima County through maintaining or improving the habitat conditions and ecosystem functions necessary for their survival."

b. Environmental Concerns and Recommendations for Further Analysis

i. I-10 (Junction I-19 to SR 83)

Any widening or improvement of I-10 in the study corridor has the potential to affect native plants, including cacti and trees protected under the Arizona Native Plant Law. The eastern end of the study corridor from Vail Road/Wentworth Road to SR 83 coincides with the City of Tucson HCP and the Pima County SDCP Biological Core Management Area. Impacts to vegetation should be minimized in this area, and opportunities to mitigate or landscape/reseed areas disturbed by construction should be explored. Due to the presence of the invasive buffelgrass in the study corridor, measures should be taken to prevent the spread of the species. The loss of native plants and the presence of an invasive species would not represent a substantial obstacle to the proposed I-10 mainline widening or interchange configurations.

ii. SR 210 (Golf Links Road to I-10)

All alternatives have the potential to affect protected native plants. The System I, System II, and System IV alternatives, adjacent to urban, industrial, and commercial land uses, would have limited effects on vegetation. The System III alternatives would result in more native vegetation removal because these alternatives cross more undisturbed land than the other alternatives. Potential effects on native plants and desert riparian habitat generally increase to the east. Native plant removal would be subject to the Arizona Native Plant Law. The loss of native plants would not represent a substantial obstacle to the proposed SR 210 extension.

3. Biology

a. Affected Environment

i. Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation (IPaC) System website was accessed on October 13, 2014 (USFWS 2014). An official list of federally protected species with the potential to occur in the study area was obtained. This list was reviewed by a qualified biologist (Stephen Hale, EcoPlan Associates, Inc.) to determine which species may occur in the study area (Table 1).

Though no critical habitat has been designated for any of the listed species potentially occurring in the study area, suitable habitat is noted for the jaguar, the lesser long-nosed bat, the Pima pineapple cactus, and the Sonoran Desert tortoise. The presence of jaguars would be extremely rare because the nearest sightings are more than 20 miles to the south, southeast, and southwest. The Tucson HCP and the Pima County MSCP recognize the potential presence of the lesser long-nosed bat, the Pima pineapple cactus, and the Sonoran Desert tortoise in the study area. Both plans identify the need to protect habitat for the cactus ferruginous pygmy-owl despite the federal delisting of the species.

Table 1. USFWS listed species, status, habitat requirements, and potential for occurrence in the study area

Name	Status	Habitat Requirements	Potential for Occurrence
California least tern *Sterna antillarum browni*	E	Open, bare, or sparsely vegetated sand, sandbars, gravel pits, or exposed flats along shorelines of inland rivers, lakes, reservoirs, or drainage systems. Elevation: <2,000 feet.	No suitable habitat. The study area lies above the known elevation range for the species. The species normally frequents West Coast beaches, but occasional individuals range into Arizona, rarely breeding in the state.
Chiricahua leopard frog *Lithobates chiricahuensis*	T	Permanent waters in ponds, tanks, cienegas (wet meadows), and small streams provide habitat. Currently restricted to springs, livestock tanks, and streams in upper portions of watersheds that are free from nonnative predators or where marginal habitat for nonnative predators exists. Elevation: 3,281 and 8,890 feet.	No suitable habitat. The study area does not occur within or cross permanent ponds, tanks, cienegas, or small streams. The nearest known populations of the species lie along semipermanent streams in the Santa Rita Mountains to within approximately 15 miles south of the study area.
Desert pupfish *Cyprinodon macularius*	E	Small streams, backwaters, shallow springs, marshes, and cienegas. Elevation: <4,000 feet.	No suitable habitat. No perennial stream habitat is in the study area. No naturally occurring or introduced populations lie in the vicinity of the study area. The nearest introduced populations are maintained in cement impoundments in Tucson, approximately 10–20 miles north and northwest of the study area.
Gila chub *Gila intermedia*	E	Pools in smaller streams, cienegas, and artificial impoundments. Elevation: 2,000 to 5,500 feet.	No suitable habitat. No perennial stream habitat occurs in the study area. The nearest native population occurs along Cienega Creek approximately 2 miles northeast of the eastern end of the I-10 study corridor.
Gila topminnow *Poeciliopsis occidentalis occidentalis*	E	Small streams, springs, and cienegas. Found primarily in shallow areas with aquatic vegetation and debris for cover. Can tolerate relatively high water temperatures and low dissolved oxygen. Elevation: <4,500 feet.	No suitable habitat. No perennial stream habitat occurs in the study area. The nearest native population occurs along Cienega Creek approximately 2 miles northeast of the eastern end of the I-10 study corridor.
Jaguar *Panthera onca*	E	Found in Sonoran desertscrub up through subalpine conifer forest. Elevation: 1,600 to 9,000 feet.	No suitable habitat. No breeding populations are in Arizona. Occasional individuals cross into Arizona from Mexico. Migrant jaguars would not be expected to remain in the vicinity of the study area due to the presence of humans, noise, and traffic in the area. Through 2006, more than 47 documented jaguar events, including 28 photos, nine sets of tracks, and 10 fecal samples, have occurred in Arizona since 2001 (McCain and Childs 2006).

Table 1. USFWS listed species, status, habitat requirements, and potential for occurrence in the study area

Name	Status	Habitat Requirements	Potential for Occurrence
Lesser long-nosed bat *Leptonycteris curasoae yerbabuenae*	E	Caves and mines for roost sites and access to healthy stands of saguaro cactus and paniculate agaves for foraging. Sonoran desertscrub vegetation community in early summer forage base, for bats found in southwestern Arizona. Semi-desert grassland and oak woodlands in late summer for bat in southeastern Arizona. Elevation: 1,600 to 11,500 feet.	No suitable caves or mines occur in the study area. The nearest known roost sites lie in the Santa Rita Mountains to within 10 miles south of the study area. Saguaros are widely scattered in the study area. Any saguaros potentially affected by project activity would be relocated outside disturbance areas. Migrating bats and foraging individuals may be occasionally expected within or passing through the study area during nocturnal activities in late summer and early fall, but these individuals would not be expected to be present during the springtime saguaro flowering season or during daytime construction activity.
Mexican spotted owl *Strix occidentalis lucida*	T	Mixed conifer or pine forest with multilayered foliage structure in steep canyons or on high mesas. Elevation: 4,100 to 9,000 feet.	No suitable habitat. No mixed conifer or pine forest with multilayered foliage structure is present in the vicinity of the study area. The study area is more than 1,000 feet below the known species elevation range.
Northern Mexican gartersnake *Thamnophis eques megalops*	T	Found in cienegas and stock tanks and river habitat that includes pools and backwaters. Elevation: 3,000 to 8,500 feet.	No suitable habitat. No cienegas, stock tanks, or river habitat in the study area. The nearest population occurs along a perennial portion of Cienega Creek approximately 2 miles northwest of the eastern end of the I-10 study corridor.
Pima pineapple cactus *Coryphantha scheeri* var. *robustispina*	E	Found in alluvial basins or on hillsides in semi-desert grassland and Sonoran desertscrub. Soils range from shallow to deep, and silty to rocky, with a preference for silty to gravely deep alluvial soils. The plant occurs most commonly in open areas on flat ridge tops or areas with less than 10–15% slope. Elevation: 2,300 to 4,500 feet.	Much of the study area between the intersection of I-10 and Alvernon Road and the junction of I-10 and SR 83 to the southeast lies within the northern edge of the range of the Pima pineapple cactus. Scattered records of occurrence are from the northwestern end of this portion of I-10, with increasing numbers of individuals reported from within the limits of the study area to the southeast. Some individuals have even been reported from within the existing ROW of I-10 between Houghton Road and SR 83.

Table 1. USFWS listed species, status, habitat requirements, and potential for occurrence in the study area

Name	Status	Habitat Requirements	Potential for Occurrence
Sonoran Desert tortoise *Gopherus morafkai*	C	Primarily rocky (often steep) hillsides and bajadas of Mohave and Sonoran desertscrub but may encroach into desert grassland, juniper woodland, interior chaparral habitats, and even pine communities. Washes and valley bottoms may be used in dispersal. Elevation: <7,800 feet.	The Sonoran Desert tortoise has been reported from within 3 miles of much of the study area. However, much of the northwestern end of the area lies on nearly flat alluvial terrain within the Tucson Basin, an area that provides less than suitable desert tortoise habitat. In addition, development over much of the northwestern end of the study area has substantially reduced the potential for tortoises to disperse into that area. Records from within the buffer at the northwestern end of the study area are attributable to individuals reported from the Tucson Mountains to the west. To the southeast, with less development and proximity to more favorable tortoise habitat along Cienega Creek/Pantano Wash to the northeast and rolling terrain to the south, habitat suitability and the potential for occurrence in the study area is increased.
Sonoyta mud turtle *Kinosternon sonoriense longifemorale*	C	Restricted to pond and stream habitat at Quitobaquito Springs in Organ Pipe Cactus National Monument, Arizona, and in nearby Rio Sonoyta, Sonora, Mexico. Elevation: 1,100 feet.	No suitable habitat. The study area does not lie within the known distribution of this subspecies. The nearest known populations lie approximately 130 miles southwest of the study area.
Southwestern willow flycatcher *Empidonax traillii extimus*	E	Cottonwood/willow and saltcedar vegetation communities along rivers and streams. Elevation: <8,500 feet.	No suitable habitat. No dense thickets of cottonwood/willow and salt cedar vegetation are present along the ephemeral washes in the study area. There are seasonal records for the species along perennial portions of Cienega Creek within approximately 1–2 miles northeast of the southeastern end of the study area.
Yellow-billed cuckoo *Coccyzus americanus*	PT	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries). Elevation: <6,500 feet.	No suitable habitat. No riparian cottonwood/willow woodlands or tamarisk gallery forests are in the study area. Seasonal records for the species are from along portions of Cienega Creek within approximately 1–2 miles northeast of the southeastern end of the study area as well as along the Santa Cruz River within 1 mile of the northwestern end of the survey area.

C = Candidate, E = Endangered, PT = Proposed Threatened, T = Threatened (USFWS 2014).
Species in bold = Pima County MSCP.

ii. Other Special Status Species

The Arizona Game and Fish Department (AGFD) On-line Environmental Review Tool (AGFD 2014) was accessed to determine other special status species known to occur within 3 miles of the study area (Table 2). The AGFD On-line Environmental Review Tool identified bat colonies, the Rincon–Santa Rita–Whetstone Linkage Design Wildlife Corridor, and the species listed in Table 2 as occurring within 3 miles of the study area. Several special status species noted previously would be expected to occur in the study area.

Table 2. Other special status species in Pima County, Arizona, and evaluation of effects

Common Name	Scientific Name	Status	Suitable Habitat Present?	Occupied Habitat Present?	Species Affected?
Arizona giant sedge	*Carex ultra*	S	No	No	No
California leaf-nosed bat	*Macrotus californicus*	SC, S, WSC	Yes	Yes	Yes
Cave myotis	*Myotis velifer*	SC	Yes	Yes	Yes
Desert sucker	*Catostomus clarkii*	SC, S	No	No	No
Giant spotted whiptail	*Aspidoscelis burti stictogrammus*	SC, S	No	No	No
Gila longfin dace	*Agosia chrysogaster chrysogaster*	SC, S	No	No	No
Gray hawk	*Buteo plagiatus*	SC, WSC	No	No	No
Lowland leopard frog	*Rana yavapaiensis*	SC, S, WSC	No	No	No
Mexican long-tongued bat	*Choeronycteris mexicana*	SC, S, WSC	Yes	Yes	Yes
Needle-spined pineapple cactus	*Echinomastus erectocentrus* var. *erectocentrus*	SC, SR	Yes	Yes	Yes
Northern beardless-tyrannulet	*Camptostoma imberbe*	S	No	No	No
Staghorn cholla	*Opuntia versicolor*	SR	Yes	Yes	Yes
Tumamoc globeberry	*Tumamoca macdougalii*	S, SR	Yes	No	No
Western burrowing owl	*Athene cunicularia hypugaea*	SC, S	Yes	Yes	Yes
Western narrow-mouthed toad	*Gastrophryne olivacea*	S, WSC	Yes	Yes	Yes

S = U.S. Forest Service or Bureau of Land Management Sensitive, SC = USFWS Species of Concern, SR = Salvage Restricted, WSC = Wildlife of Special Concern in Arizona (AGFD 2014).
Species in bold – Pima County MSCP

iii. Wildlife Movement Corridors and Linkages

The movement of wildlife through the study area depends on the availability of preferred habitat, foraging range, migration, and dispersal patterns. Many resident birds and terrestrial wildlife species find the limited cover, altered habitat, and the presence of structures and roads in developed areas to present a barrier to movement. For these species, wildlife corridors include gaps in development where animals are funneled between patches of preferred habitat. EcoPlan combined a review of aerial photographs, on-the-ground surveys for evidence of wildlife usage, literature from wildlife management agencies, and anecdotal data to locate and determine potential wildlife movement corridors and linkages in the study area. In addition, the Feasibility

Study team met with AGFD representatives to discuss concerns and opportunities related to movement corridors and wildlife linkages on November 9, 2010, and during subsequent regular project progress meetings.

The traffic, noise, and fencing associated with the I-10 corridor poses a barrier for most large mammals and other terrestrial species seeking to disperse across the study area, increasing mortality rates and the likelihood of negative wildlife-human interactions. Some individuals may avoid the corridor altogether, remaining within preferred habitat of the desert mountain ranges and other areas of relatively undisturbed desertscrub habitat well away from I-10. Terrestrial wildlife seeking to cross the I-10 corridor may frequent areas where relatively undisturbed desertscrub habitat abuts the roadway and where drainage crossing structures exist; however, vehicle-wildlife collision data collected along this section of I-10 suggest that individuals are also crossing the open roadway where no crossing structures exist (AGFD 2010a), placing motorists and wildlife in danger. No wildlife crossings of existing SR 210 are known; the roadway is fenced and has substantial development barriers on both sides.

The Arizona Wildlife Linkages Workgroup is a cooperative effort among ADOT, the USFWS, the Bureau of Land Management, the AGFD, and several other federal and state agencies, academic institutions, and conservation organizations. This group has identified known and potential wildlife corridors and developed Arizona's Wildlife Linkages Assessment (Figure 6). The Workgroup has identified the Rincon–Santa Rita–Whetstone Linkage (Beier et al. 2006), a wildlife movement corridor between mountain ranges north and south of I-10. This linkage does not cross the study area. Maintaining linkages between habitat blocks helps to ensure that wildlife populations remain healthy and viable by allowing day-to-day movement, seasonal migration routes, dispersal of offspring, and gene flow, and increasing the potential for recolonization of unoccupied habitat. The AGFD identified the I-10 corridor as the most significant threat to connectivity between wildlife habitat blocks. The Rincon–Santa Rita–Whetstone Linkage lies approximately 2 miles east of SR 83 and is outside the study area (AGFD 2010a).

Similar to the Rincon–Santa Rita–Whetstone Linkage, Pima County identified Critical Landscape Connections (CLC) (Pima County 2014a, 2014b), which outline general areas where wildlife moves between large habitat blocks of intact, protected natural landscapes. CLCs are defined by Pima County as "areas where biological connectivity is significantly compromised, but where opportunity to preserve or otherwise improve the movement of wildlife between major conservation areas and/or mountain ranges still persists" (Pima County 2014a, 2014b). CLC 3 encompasses areas on both sides of I-10 from the border of Pima and Cochise counties west to the area around Houghton Road. The area from SR 83 west to the Wentworth Road/Colossal Cave Road TI, is categorized in the Conservation Lands System (CLS) as a Biological Core Management Area—an area with high biological value. Farther west, the area is categorized as a Multiple Use Management Area—an area where biological values are significant but not as high as the Biological Core Management Areas (Pima County 2014a).

Wildlife may use undeveloped areas with relatively little disturbance as movement corridors due to the isolation from human disturbances. The natural drainage channels crossing the study area, especially Julian Wash due to its size and length, can also act as wildlife corridors. In these washes, habitat complexity and topographic relief provided by the drainage channels and

bordering xeroriparian vegetation funnel wildlife through adjacent developed or open terrain. These xeroriparian corridors are beneficial to wildlife because they provide:

- Continuous natural corridors through areas of development
- Ephemeral water sources for wildlife
- A visual screen from surrounding development, thereby increasing the actual and perceived sense of security for passing wildlife
- A corridor of preferred habitat for riparian birds
- Habitat and migration corridors for smaller terrestrial species (rodents, reptiles, and amphibians)
- Habitat for xeroriparian plant species

During pedestrian and driving surveys of the study area January 3–6, 2011, there was ample evidence (tracks in the sandy bottom of wash crossings under and adjacent to I-10 and roadside carcasses) to indicate that javelina *(Tayassu tajacu)*, coyote *(Canis latrans)*, and possibly kit fox *(Vulpes macrotis)*, gray fox *(Urocyon cinereoargenteus)*, and skunks (family Mephitidae) traverse and forage in the undeveloped space and wash corridors in the study area. As shown in Table 3, additional vehicle-wildlife collision data provided by the AGFD for 2006–2010 (2010a) indicate that mule deer *(Odocoileus hemionus)* and white-tailed deer *(Odocoileus virginianus)* also use the study area as a movement corridor. Immediately east of the study area, the vehicle-wildlife collision data indicate that in addition to the previous species, American black bear *(Ursus americanus)* and mountain lion *(Puma concolor)* cross I-10. The AGFD staff interviewed posited that the reported vehicle-wildlife collisions only represent 5 to 25 percent of wildlife mortalities (AGFD 2010a); therefore, Table 3 provides the number of mortalities reported and the estimated mortalities based on this research. Continued coordination with AGFD representatives during the DCR/NEPA phase will update collision data.

b. Environmental Concerns and Recommendations for Further Analysis

i. <u>I-10 (Junction I-19 to SR 83)</u>

Any improvements in the study corridor east of Houghton Road have the potential to affect plants and wildlife identified in the Tucson HCP, the Pima County MSCP, the AGFD special status species list, or the USFWS threatened and endangered species list. During the DCR/NEPA phase, a more detailed Biological Evaluation would be needed to determine the specific presence/absence of protected species and potential mitigation measures. Further coordination with the USFWS, the AGFD, the City of Tucson, and Pima County would be needed. A survey for protected native plants (as defined by the Arizona Department of Agriculture) would need to be undertaken during future environmental analyses.

Table 3. Vehicle-wildlife collision data, MP 274 to MP 302, 2006–2010

MP	Species	Number of Recorded Mortalities Over Approximately Past 5 Years	Extrapolation If Only 25% of Mortalities Were Recorded	Extrapolation If Only 5% of Mortalities Were Recorded
In the Study Area				
274–276	Mule deer	2	20	40
	Unknown species	2	20	40
278–280	Mule deer	3	12	60
	White-tailed deer	1	4	20
	Unknown species	9	36	180
281–283	Unknown species	6	24	120
Total Mortalities 274–283		**23**	**92**	**460**
Immediately East of the Study Area				
284–286	Mule deer	2	8	40
	Black bear	1	4	20
	Unknown species	2	8	40
288–290	Mule deer	5	20	100
	White-tailed deer	1	4	20
	Mountain lion	2	8	40
	Unknown species	1	4	20
291–293	Mule deer	1	4	20
	Unknown species	3	12	60
294–296	Mule deer	5	20	100
	Unknown species	4	16	80
297–299	Mule deer	5	20	100
	Mountain lion	2	8	40
	Javelina	2	8	40
	Unknown species	3	12	60
300–302	Javelina	3	12	60
Total Mortalities 284–302		**42**	**168**	**840**

The primary species of concern based on the limited data collection and field review would include:

- Pima pineapple cactus—Individual plants were observed in the I-10/SR 83 TI vicinity during field review. Should this protected species be affected, Section 7 consultation with the USFWS would be required.
- Lesser long-nosed bat—Though roosting sites are not likely in the study area, forage species of columnar cacti and agave species are present. Informal consultation with the USFWS would be needed to determine whether mitigation measures would be required (e.g., avoidance of plant forage species or landscaping opportunities).
- Sonoran Desert tortoise—The eastern end of the study corridor supports potential habitat for the Sonoran Desert tortoise. Occurrences have been recorded within 3 miles north and east of the study area (AGFD 2004), including a tortoise that was struck crossing I-10 approximately 8.6 miles east of SR 83 (AGFD 2010b). It is recommended that coordination take place with the USFWS to determine whether additional information is available on the presence of this species in the study corridor or vicinity.

The wildlife corridors identified in this EO are based on current data, field observations, and communication with the AGFD. Additional corridors and linkages may exist. During the design process for this project, it is recommended that the design team coordinate with the AGFD, the USFWS, and the Arizona Wildlife Linkages Workgroup to incorporate elements and features into the final design to protect wildlife from roadway traffic and allow for the ease of movement of wildlife across the project area in safety.

ii. SR 210 (Golf Links Road to I-10)

No direct effects to threatened and endangered species would be expected with the System I and System II alternatives. Based on the occurrence of natural terrain, the System IIIc alternative may cross suitable habitat for the lesser long-nosed bat, the Pima pineapple cactus, and the Sonoran Desert tortoise. The primary species of concern, based on the limited data collection and field review, would include:

- Pima pineapple cactus—No individual plants were observed in the SR 210 study corridor during field review. Should this protected species be affected, Section 7 consultation with the USFWS would be required.
- Lesser long-nosed bat—Though roosting sites are not likely in the study area, forage species of columnar cacti and agave species are present. Informal consultation with the USFWS would be needed to determine whether mitigation measures are required (e.g., avoidance of plant forage species or landscaping opportunities).
- Sonoran Desert tortoise—The eastern end of the study corridor supports potential habitat for the Sonoran Desert tortoise. It is recommended that coordination take place with the USFWS to determine whether additional information is available on the presence of this species in the study corridor or vicinity.

A survey for protected native plants (as defined by the Arizona Department of Agriculture) should be undertaken during future environmental analyses.

The designated SDCP and Rincon–Santa Rita–Whetstone Linkage wildlife movement corridors are east of the study corridor and would not be affected by any of the three alternatives under consideration. All three alternatives would have a potential to affect xeroriparian drainages, which provide sheltered movement corridors for wildlife. The System IIIc alternative would likely have a greater impact on these resources than the System I and System II alternatives because the potential for impact generally increases to the east.

The wildlife corridors identified in this EO are based on current data and anecdotal field observations. Additional corridors and linkages may exist. Coordination with the AGFD and the USFWS to incorporate elements and features into the final design to protect wildlife from roadway traffic and allow for the ease and safety of movement of wildlife across the study area should be undertaken during the design process.

With the System I or System II alternatives, impacts to biological resources would be expected to be minimal.

4. *Hydrology*

a. *Affected Environment*

i. Floodplains

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map panels dated June 16, 2011 (FEMA 2014) for the study area (maps 04019C2278L, 04019C2279L, 04019C2283L, 04019C2284L, 04019C2286L, 04019C2287L, 04019C2291L, 04019C2293L, 04019C2295L, 04019C2315L, 04019C2900L, 04019C2905L, 04019C2925L, and 04019C2940L) shows that a portion of the study area falls within a 100-year floodplain (Zone A) and a 100- to 500-year floodplain (Zone X). Zone A is defined as areas subject to a 1 percent annual chance of flooding, and Zone X are areas of moderate flood hazard between the 100- and 500-year floods (Figure 7). The major floodplain in the study area is the Julian Wash floodplain, which parallels I-10 from I-19 to the Pantano Road alignment east of Kolb Road. No floodplains are in the study area east of the Pantano Road alignment.

ii. Water Quality

Section 404 of the Clean Water Act regulates the placement of fill or dredged material into Waters of the United States (Waters). The U.S. Army Corps of Engineers has regulatory jurisdiction of Waters. A Section 401 Water Quality Certification, which is administered by the Arizona Department of Environmental Quality (ADEQ), is required for any action subject to Section 404; however, most projects that fall under a Nationwide Permit are conditionally certified under Section 401. In Arizona, Waters generally include rivers, natural ponds, lakes, most washes, some canals, and wetlands. Three large drainage features (greater than 2,000 cubic feet per second) cross I-10 in the study area: the Tucson Diversion Channel, which crosses under I-10 at MP 262.8; Julian Wash, which crosses I-10 east of Alvernon Way (the wash then joins the Tucson Diversion Channel just south of I-10 at Kino Parkway); and Franco Wash Tributary, which crosses I-10 at about MP 277.2 (east of Houghton Road). All three exhibit characteristics indicative of Waters. Other minor drainages (less than 2,000 cubic feet per second) occur in the study area and may be jurisdictional.

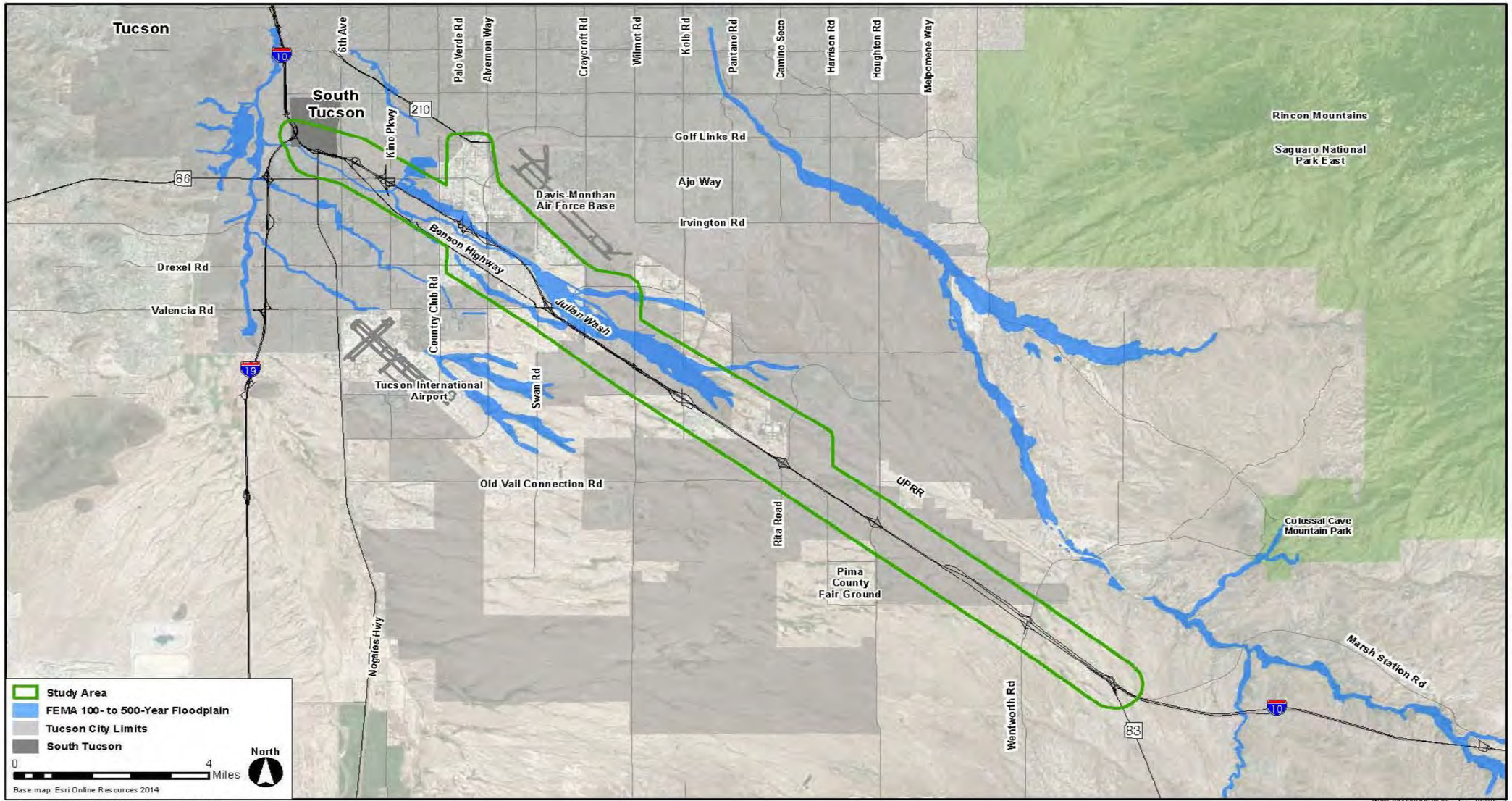

Figure 7. 100- to 500-year floodplain

iii. Sole Source Aquifer

This study area is within the Upper Santa Cruz & Avra Basin Sole Source Aquifer designated area. In accordance with the November 2002 U.S. Environmental Protection Agency (EPA)/ FHWA Memorandum of Understanding, a Safe Drinking Water Act Section 1424(e) review by the EPA would be required because this project would likely be processed as an EA. Depth to groundwater based on registered wells in the study area varies from 57 feet to 380 feet, with most wells recording water at 80- to 110-foot depth (Allands 2010).

b. Environmental Concerns and Recommendations for Further Analysis

i. I-10 (Junction I-19 to SR 83)

Impacts to floodplains, water quality, or the sole source aquifer would not be expected to have a major role in determining I-10 improvements. Any widening of the I-10 mainline and new interchange ramps on the north side of I-10 between Kino Parkway and Craycroft Road may encroach on the 100- to 500-year Julian Wash floodplain. Drainage analysis during design would be needed to determine the degree of impacts. Primarily, impacts could be expected at Country Club Road (new TI), Alvernon Way (expanded TI under System I), and Swan Road (new TI under System II).

A jurisdictional delineation should be conducted during final design to identify all Waters in the study area. Julian Wash crosses I-10 at MP 265.7 via a box culvert. An extended culvert would be required with the planned improvements to I-10. The Franco Wash Tributary crosses I-10 at MP 277.4 via a small bridge. This crossing would likely require a new or expanded structure. Multiple smaller washes would similarly require extended pipes or culverts. Work within Waters would be anticipated to qualify under a Section 404 Nationwide Permit. Further analysis of jurisdictional waters should be addressed in the DCR/NEPA phase of project development.

Coordination with the EPA during design would need to occur relative to sole source aquifer impacts. Transportation projects typically do not affect sole source aquifers due to limited excavation depths and best management practices that preclude the introduction of contaminants to the aquifer from construction activities. Typical roadway construction does not affect the aquifer due to the depth of groundwater and lack of need for deep bridge/pier foundations. Landscaping with low water use desert or desert adaptable plantings would be consistent with EPA guidelines.

ii. SR 210 (Golf Links Road to I-10)

The System I, II, IIIc, and IV alternatives would all cross the Julian Wash floodplain. The System I and IV alternatives would have the least effect, crossing the 100- to 500-year floodplain for only a short distance at I-10 and Alvernon Way. The System II alternative crosses the 100- to 500-year floodplain for about 0.25 mile along the Swan Road alignment north of I-10. The greatest potential effect to the floodplain would occur with the System IIIc alternative; this alignment would cross the 100-year west of Wilmot Road in a relatively undisturbed segment of the wash. The System III alternatives would require multiple crossings of Julian Wash, primarily in channelized areas; this impact is one of the reasons why the System III alternatives were eliminated from further consideration.

A jurisdictional delineation should be conducted during final design to identify all Waters in the study area. Many of the drainages that cross the alternatives support limited habitat due to their urban settings and because many are channelized. With any of the alternatives, the project would necessitate the crossing of Waters and compliance with Clean Water Act Sections 401 and 404. Further analysis of jurisdictional Waters should be addressed in the DCR/NEPA phase of project development. It is likely the System I, II, and IV alternatives would qualify for a Nationwide Permit 14 for Linear Transportation Projects. System III alternatives might require an Individual Permit due to needed channelization and multiple wash crossings.

Transportation projects typically do not affect sole source aquifers due to limited excavation depths and best management practices that preclude the introduction of contaminants to the aquifer from construction activities. The selection of alignment alternatives would not be influenced by the presence of the sole source aquifer.

5. Noise

The following terms are used to quantify impacts and define sound levels:

- *Decibel.* A decibel (dB) is a unit of measure for the intensity or loudness of sound.
- *dBA.* dBA represents the noise levels in decibels measured with an A-weighted frequency. The A-weighting corresponds to the A-scale on a standard sound level instrument that closely approximates frequencies that the human ear can detect.
- *L_{eq}.* L_{eq} is defined as the equivalent continuous sound level. For normal human hearing, the actual sound level measurement is modified by applying A-weighting. The A-weighted sound level is the most widely used measure of environmental noise. L_{Aeqlh} is used when L_{eq} is measured hourly and the A-weighted scale is used.

The key regulations and guidance that assist in the determination of noise impacts in Arizona and when it is applicable to provide mitigation for impacted noise-sensitive land areas (receptors) include:

- FHWA Procedures for Abatement of Highway Traffic Noise and Construction Noise (Code of Federal Regulations [CFR] Title 23, Part 772)
- FHWA Highway Traffic Noise Analysis and Abatement Guidance, July 2010 (FHWA 2011a)
- ADOT Noise Abatement Policy, July 2011 (ADOT 2011a)

CFR Title 23, Part 772, provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. Under CFR Title 23, Part 772.7, projects are categorized as Type I, Type II, or Type III. A Type I project includes construction of a highway on a new location; physical alteration of an existing highway; addition of a new through lane, high-occupancy-vehicle lane, or auxiliary lane; addition or relocation of interchange lanes or ramps added to complete an existing partial interchange; restriping existing pavement for the purpose of adding a through traffic lane or auxiliary lane; or addition of a new or substantial alteration of a weigh stations, rest stops, ride share lot, or toll plaza. A noise analysis is required for all Type I projects. A Type II project is for noise abatement on an existing highway that involves no changes to highway capacity or alignment. ADOT does not currently have a Type II program. A Type III project is one that does not meet the classification of

a Type I or Type II project. The addition of turn lanes would be a Type III project. Type III projects do not require a noise analysis. The proposed improvements include the addition of through lanes, which is considered a Type I project. Therefore, a noise analysis is required.

The FHWA Noise Abatement Criteria (NAC) has defined noise levels for land activity categories (Table 4). ADOT has adopted these NAC and established thresholds for noise levels that approach the FHWA NAC. ADOT defines this threshold as 3 dBA below the NAC for Categories A–E. Categories F and G do not have a noise impact threshold. FHWA guidelines also state that noise abatement should be considered when the noise levels substantially exceed the existing noise levels (CFR Title 23, Part 772.5[g]). This criterion is defined by ADOT as increases in the L_{eq} of 15 dBA or more above existing noise levels.

Table 4. FHWA Noise Abatement Criteria, hourly A-weighted sound level decibels (dBA)

Activity Category	L_{Aeqh} exterior	L_{Aeqh} interior	Description of Activity Category
A	57	–	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[a]	67	52	Residential
C1	67	–	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	–	52	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E[a]	72	–	Hotels, motels, offices, restaurants/bar, and other developed lands, properties or activities not included in A–D or F
F	–	–	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	–	–	Undeveloped lands that are not permitted for development

[a] Includes undeveloped lands permitted for this activity category.

a. Affected Environment

Land uses in the study area consist of residential, commercial development, light industrial uses, schools, parks, and places of worship. The study area is heavily developed on the northwest and central portions of the study area, and is rural with scattered residential dwellings near the southeast end of the study area. In addition to roadway and interstate facilities, three major noise generation sources influence ambient noise in the study area: the DMAFB (immediately adjacent to the study area), Tucson International Airport (2.5 miles south of the study area), and the UPRR.

More than 500 residential receivers are within 1,000 feet of the study area; some are adjacent to, or have minimal setback from, I-10 (Figure 8). Scattered subdivisions are on both sides of I-10 from I-19 to Kolb Road. A large-lot subdivision near SR 83 is immediately south of I-10.

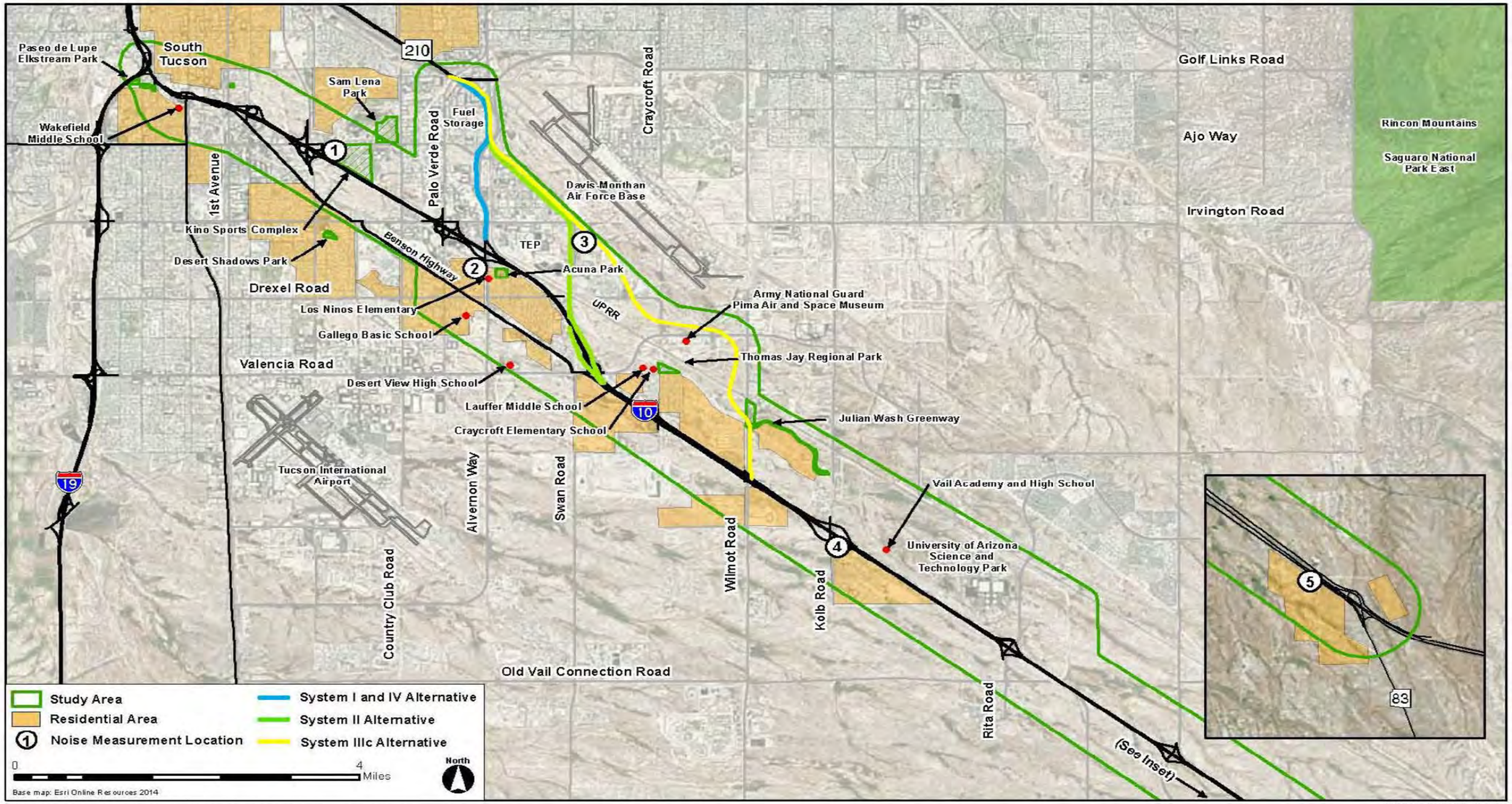

Figure 8. Noise-sensitive receptors and noise measurement locations

An isolated residential parcel near Alvernon Way and SR 210 is in the SR 210 study corridor, and several residential developments are in the Wilmot Road vicinity. The central portion of the study area between Rita Road and Wentworth Road has no residential receptors.

Field noise measurements were taken at five locations in the study area to determine ambient noise levels. Noise levels were taken during peak traffic volume periods—from 7 to 9 a.m. and from 4 to 6 p.m. Figure 8 depicts the locations of the field noise measurements.

Table 5 summarizes the field noise measurements in the study area and reflects an arithmetic average of three 15-minute readings taken at each location. The L_{Aeq1h} represents the equivalent continuous sound level (dB) occurring during the measurement period, L_{min} represents the minimum decibel reading, and L_{max} represents the maximum decibel reading of the study occurrence.

Table 5. Field noise measurement summary

Location	Activity Category (NAC)	Time	Distance	L_{Aeq1h}	L_{min}	L_{max}
1. Country Club Park	C	7 a.m.–8 a.m.	150 feet from SR 210 centerline	58.9 dBA	51.6 dBA	70.6 dBA
2. Augie Acuña Los Niños neighborhood park	C	8:30 a.m.–9:30 a.m.	450 feet from I-10 centerline	62.5 dBA	53.1 dBA	75.2 dBA
3. Residential property at Wyoming Street and Arcadia Avenue	B	10:15 a.m.–11 a.m.	Not available	56.0 dBA	51.6 dBA	69.2 dBA
4. Residential property at I-10 Frontage Road and Kolb Road	B	5:30 p.m.–6:30 p.m.	350 feet from I-10 centerline	68.9 dBA	59.4 dBA	77.0 dBA
5. Residential propertyI-10 and Sonoita Ranch Circle	B	4 p.m.–5 p.m.	275 feet from I-10 centerline	51.6 dBA	53.8 dBA	76.2 dBA

b. Environmental Concerns and Recommendations for Further Analysis

i. I-10 (Junction I-19 to SR 83)

A detailed noise analysis should be completed during the DCR/NEPA phase of project development. Peak hour traffic noise levels would be modeled for noise receptors within 1,000 feet of the I-10 study corridor using the FHWA's approved Traffic Noise Model version 2.5 (TNM2.5). In addition, the TNM2.5 would be used to establish the existing, future no-build, and build scenarios.

Since future traffic noise impacts are anticipated to occur as a result of the proposed project, noise abatement measures should be assessed for all affected noise receptors. Noise abatement measures considered during the DCR/NEPA phase would include alteration of the roadway alignment, acquisition of ROW to provide buffer zones, traffic management measures (control devices and traffic/vehicle restrictions), insulation of Category D land use facilities when exterior noise abatement is not feasible and reasonable, and noise barriers (noise walls, noise berms, combination wall/berms). Noise abatement measures that are feasible and reasonable

would be recommended. Best management practices would be recommended as necessary for temporary construction-related noise impacts.

Pima County and the City of Tucson have developed a code of ordinances and noise policies to protect sensitive land uses from roadway traffic noise. Because federal and state funds would be used for this project, the detailed noise analysis would adhere to FHWA and ADOT regulations and policies. The county and city ordinances and policies pertaining to noise abatement would only be considered after consultation among FWHA, ADOT, and the relevant jurisdictions.

During the DCR/NEPA phase, a quantitative analysis of potential noise impacts using FHWA TNM2.5 would occur. Locations along I-10 warranting further evaluation during the DCR/NEPA phase could include, but would not be limited to, the vicinity of the following cross streets:

- 10th Avenue—eastbound and westbound
- Country Club Road—eastbound southwest quadrant
- Alvernon Way to Drexel Road alignment—eastbound
- Valencia Road—eastbound southwest quadrant
- Craycroft Road to Wilmot Road—westbound
- Wilmot Road—eastbound
- Kolb Road to 0.5 mile east—eastbound
- SR 83 to 0.5 mile west—eastbound

Due to projected year 2040 traffic volumes ranging from just over 74,500 Average Daily Traffic (ADT) east of SR 83 on I-10 to over 217,600 ADT on I-10 approaching I-19, it is expected noise mitigation would be required at several of the above-noted locations.

ii. SR 210 (Golf Links Road to I-10)

A detailed noise analysis should be completed during the DCR/NEPA phase of project development. Noise receptors within 1,000 feet of the I-10 study corridor would be modeled using the FHWA's approved Traffic Noise Model version 2.5 (TNM2.5). In addition, the TNM2.5 would be used to validate the existing field measurements.

Because future traffic noise impacts are anticipated to occur as a result of the proposed project, noise abatement measures would be assessed for all affected noise receptors. Noise abatement measures considered during the DCR/NEPA phase would include alteration of the roadway alignment, acquisition of ROW to provide buffer zones, traffic management measures (control devices and traffic/vehicle restrictions), insulation of Category D land use facilities when exterior noise abatement is not feasible and reasonable, and noise barriers (noise walls, noise berms, combination wall/berms). Noise abatement measures that are feasible and reasonable would be recommended. Best management practices would be recommended as necessary for temporary construction-related noise impacts.

Pima County and the City of Tucson have developed a code of ordinances and noise policies to protect sensitive land uses from roadway traffic noise. Because federal and state funds would be used for this project, the detailed noise analysis would adhere to FHWA and ADOT regulations and policies. The county and city ordinances and policies would only be considered after consultation between FHWA, ADOT, and the relevant jurisdictions.

During the DCR/NEPA phase, a quantitative analysis of potential noise impacts using FHWA TNM2.5 modeling would occur. Only the System IIIc alternative would appear to present substantial potential to affect residential noise receptors in the vicinity of Wilmot Road. The System I and System II alternatives are primarily in a business/industrial setting and therefore would have limited potential to affect residential properties or require mitigation. The isolated residential area near SR 210 and Golf Links Road would be evaluated for impacts and possible noise abatement.

6. *Air Quality*

Air quality is assessed at the regional and project level. The study area is under the jurisdiction of the EPA, the ADEQ, the Pima County Department of Environmental Quality (PDEQ), and the PAG.

Areas can be classified as non-attainment, attainment, or maintenance. Geographic areas that exceed National Ambient Air Quality Standards (NAAQS) for a criteria pollutant are considered "non-attainment" areas for that pollutant. Conversely, areas that are below a criteria pollutant standard are considered "attainment." Maintenance areas are defined as previously exceeding the NAAQS (non-attainment) for a criteria pollutant but are currently attaining that standard. Maintenance areas are required to develop a maintenance plan outlining steps for continued attainment over the maintenance period.

The Clean Air Act (CAA) of 1970, which was last amended in 1990, is the federal law that governs air quality. The EPA is responsible for establishing NAAQS for each of six criteria pollutants to protect public health (primary standards) and welfare (secondary standards) associated with air pollution. These six criteria pollutants are carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 2.5 microns in diameter and less than 10 microns in diameter ($PM_{2.5}$ and PM_{10}), and lead (Pb). The State of Arizona has adopted the NAAQS for these criteria pollutants. Pollutants typically associated with vehicle traffic are CO, O_3, nitrogen oxides, and particulate matter (PM). Table 6 provides the NAAQS for criteria pollutants.

a. Affected Environment

Pima County is designated as an attainment area with a maintenance plan for CO and attainment for all other criteria pollutants. Vehicle emissions are a major source of CO. The entire study area falls within the Tucson Carbon Monoxide Maintenance Area. The northwest and central portions of the study area are heavily developed, and the southeast portion is primarily rural with dispersed residences. Land uses in the study area consist of residential, commercial development, light industrial uses, schools, parks, and places of worship.

Table 6. National Ambient Air Quality Standards for criteria pollutants

Pollutant/Averaging Time	Primary Standard	Secondary Standard
Carbon monoxide (CO)		
8-hour	9 ppm[a]	–
1-hour	35 ppm	–
Lead (Pb)		
Rolling 3-month average	0.15 μg/m³	0.15 μg/m³
Nitrogen dioxide (NO_2)		
Annual arithmetic mean	53 ppb	53 ppb
1-hour	100 ppb	100 ppb
Ozone (O_3)		
1-hour	Revoked	Revoked
8-hour	0.075 ppm	0.075 ppm
Particulate matter less than 10 microns (PM_{10})		
Annual	Revoked	Revoked
24-hour	150 μg/m³	150 μg/m³
Particulate matter less than 2.5 microns ($PM_{2.5}$)		
Annual	15 μg/m³	15 μg/m³
24-hour	35 μg/m³	35 μg/m³
Sulfur dioxide (SO_2)		
Annual arithmetic mean	Revoked	–
24-hour	Revoked	–
1-hour	75 ppb	–
3-hour	–	0.5 ppm

ppm = parts per million; μg/m³= micrograms per cubic meter; ppb = parts per billion.
Source: EPA 2011.

i. Air Quality Monitoring

Concentrations of criteria pollutants in Pima County are monitored by the PDEQ. Six monitoring stations in Pima County monitor CO concentrations (Table 7). As shown in Table 7, CO concentrations have not exceeded the NAAQS.

Table 7. Monitored CO values at Pima County monitoring stations

Monitoring Station	Compliance Standard[1]	CO (parts per million)			
		2011	2012	2013	2014
1237 S. Beverly Ave.	CO 1-hour	2.0	1.8	1.6	1.6
	CO 8-hour	0.9	1.0	0.7	0.7
22nd Street and Alvernon Road (closest station to the study area, approximately 1.5 miles north of SR 210 and about 3 miles north of I-10)	CO 1-hour	2.5	2.3	1.8	1.7
	CO 8-hour	1.6	1.2	1.1	0.9
2745 N. Cherry Ave.	CO 1-hour	1.7	1.4	1.8	1.4
	CO 8-hour	1.2	1.2	1.1	1.0
400 W. River Road	CO 1-hour	1.1	1.0	0.9	0.9
	CO 8-hour	0.6	0.6	0.6	0.6
2601 S. Kolb Road	CO 1-hour	1.6	1.4	1.3	1.2
	CO 8-hour	1.1	0.9	0.8	0.8

[1]The maximum of the second-highest monitored value in a two-year period must not exceed the NAAQS compliance standard; 1 hour (9 ppm), 8-hour (35 ppm).
Sources: EPA 2014 and Pima County 2014c.

ii. Mobile Source Air Toxics

In addition to the NAAQS for criteria air pollutants, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the CAA Amendments of 1990. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted into the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

Seven of the 21 MSATs have been labeled by the FHWA as priority MSATs and include formaldehyde, naphthalene and polycyclic organic matter, acrolein, benzene, 1,3-butadiene, diesel PM, and diesel exhaust organic gases.

iii. Class I Areas

Under the provisions of the CAA, the EPA has designated a number of areas in Arizona as Mandatory Class I Federal Areas, where visibility is an important value. These include national parks and wilderness areas. These mandatory Class I areas are listed in CFR Title 40, Part 81.406. Of the mandatory Class I areas, Saguaro National Park is the closest to the study area. The nearest boundary of the park is approximately 10 miles northwest of the SR 210 study area and 6.5 miles northeast of I-10.

iv. Conformity

The CAA requires that all regionally significant and federally funded transportation projects in non-attainment or maintenance areas must meet the transportation conformity regulations. Pursuant to the conformity provisions of the CAA, projects in non-attainment or maintenance areas must conform to a state implementation plan and ensure that transportation activities will not cause or contribute to new violations, worsen existing violations, or delay attainment of air quality standards.

An air quality nonexempt project generally adds transportation capacity and must comply with the conformity requirements. All projects within an attainment/maintenance area must be included in the current fiscally constrained and air quality conforming Regional Transportation Plan and Transportation Improvement Program.

At the project level, ADOT is mostly concerned with CO because it is directly emitted from the tailpipes of motor vehicles. Conformity at the project level requires a "hot spot" analysis if an area is in "non-attainment" or "maintenance." For this project, a CO "hot spot" analysis would be required.

b. Environmental Concerns and Recommendations for Further Analysis

i. I-10 (Junction I-19 to SR 83)

The project would need to be included in fiscally constrained and air quality confirming programs and plans and would need to adhere to local air quality regulations, including Title 17 of the Pima County Code, Title 18 of the Arizona Administrative Code, and the Arizona Revised Statutes Section 49-401.

During the Design DCR/NEPA phase of the project, quantitative microscale air quality impacts would be evaluated using the EPA Motor Vehicle Emissions model version 2014 (MOVES2014) and the FHWA CAL3QHC model. The degrees of air quality impacts are contingent on the operational efficiency of each alternative. Factors such as traffic volume, LOS, intersection delay times, speed, percent of heavy trucks, and directional flow influence the modeling results. Until the detailed modeling is complete, it is not known how the I-10 improvements would perform in terms of air quality. Typically, such analysis does not represent a critical factor in determining the best alternative or dropping an alternative.

A qualitative assessment of MSATs should be completed during the DCR/NEPA phase based on projected traffic volumes, which exceed 150,000 vehicles per day on segments of I-10 between I-19 and SR 210, consistent with ADOT's Level 3 MSAT guidance and derived in part from a study conducted by the FHWA titled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives* (FHWA 2012a). The MOVES2014 model provides a method for making quantitative comparisons of MSAT emissions among project alternatives; however, the assessment of health impacts associated with MSATs is still not well established. The EPA trend projections in MSAT emissions and the limitations in developing a health-based standard are presented in Appendix A.

ii. SR 210 (Golf Links Road to I-10)

The project would need to be included in fiscally constrained and air quality confirming programs and plans and would need to adhere to local air quality regulations, including Title 17 of the Pima County Code, Title 18 of the Arizona Administrative Code, and the Arizona Revised Statutes Section 49-401.

During the DCR/NEPA phase of the project, quantitative microscale air quality impacts would be evaluated using the FHWA CAL3HQC model. The degrees of air quality impacts are contingent on the operational efficiency of each alternative. Factors such as traffic volume, LOS, intersection delay times, speed, percent of heavy trucks, and directional flow influence the modeling. Until the detailed modeling is completed, it is not known which of the three alternatives would perform best in terms of air quality. Typically, such analysis does not represent a critical factor in determining the best alternative or dropping an alternative.

A qualitative assessment of MSATs should be undertaken during the DCR/NEPA phase, which would be consistent with ADOT's Level 2 MSAT guidance and derived in part from a study conducted by the FHWA (FHWA 2012b).

7. *Hazardous Materials*

Hazardous materials are regulated by the EPA pursuant to the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act. The regulation and administration of hazardous materials, incidents, and databases is the responsibility of the ADEQ and the EPA. A background review of federal and state hazardous materials databases was completed for the project (Allands 2010). The purpose of the background review was to evaluate and identify the presence of hazardous materials or similar environmental concerns that may adversely affect the project. This effort included a review of recent aerial photography and an evaluation of a study area database search. See Appendix B for approximate mapping of the database sites. A 2014 database report was not conducted because no substantive land use changes have occurred, and completion of a newer report was not likely to result in new information that would indicate a fatal flaw in any alignment. During the DCR/NEPA phase, more detailed analysis including Preliminary Initial Site Assessments or Phase 1 Environmental Site Assessments would be required.

a. Affected Environment

The database search for the study area revealed about 80 underground storage tanks (UST) or leaking UST sites, 40–50 hazardous materials incidents requiring emergency response, almost 50 Emergency Response Notification System incidents, 20 Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) sites, and more than 100 RCRA sites in the study area. No landfills are known to be located in the study area. Two listed landfills are nearby but outside of the study area. The DMAFB Closed Solid Waste Landfill is southwest of the main DMAFB runway and was active 40 to 60 years ago. The second is at the Tucson Terminal at 3685 E. Ajo Way, which may still remain active/open.

Only two leaking UST cases remain open—the Park Avenue Shell Station at Benson Highway and Park Avenue (0.125 mile south of I-10/Park Avenue TI) and the Tucson Unified School District facility at 4115 E. Illinois St. (currently a construction contractor's office and equipment yard). Remediation for subsurface contaminated soils is ongoing. All other former leaking UST facilities were granted regulatory case closure between 1987 and 2008, when their subsurface soils and/or groundwater contamination were mitigated to meet the state risk-based correction action levels.

Only one of the listed CERCLIS sites in the study area was not listed under the No Further Remedial Action Planned status—the IBM facility at 9000 S. Rita Road (just north of I-10/Rita Road), which may still be under investigation and consideration for the National Priorities List. All Emergency Response Notification System incidents have achieved ADEQ closure. Only four of the RCRA facilities in or near the study area had any histories of noncompliance or regulatory violations. Three of the sites are on Rita Road near I-10 and the fourth is on Benson Highway; all facilities were granted closure.

The DMAFB provided additional information regarding ongoing remediation and known potential hazardous materials sites (DMAFB 2012). The sites include:

- A Military Munitions Response Program site (unexploded ordinances, metals, and semivolatile organic compounds)

- A former training area and target range with minimal potential for unexploded ordinances and debris piles (metal waste, auto parts, drums)

The SR 210 alternatives that would encroach on DMAFB property would require further hazardous materials evaluation.

b. Environmental Concerns and Recommendations for Further Analysis

i. <u>I-10 (Junction I-19 to SR 83)</u>

No hazardous materials issues are known within the current ADOT I-10 ROW or the immediately adjacent properties. Though several properties adjacent to I-10 use or contain hazardous or regulated materials, none currently is subject to any remediation activity. No known hazardous materials sites or incidents would pose a significant obstacle to project development. A more detailed evaluation based on specific ROW needs should occur during the DCR/NEPA phase of project development.

ii. <u>SR 210 (Golf Links Road to I-10)</u>

All three alternatives share the western portion of the project area and cross, or are adjacent to, industrial/commercial properties listed in the various databases. The System II and System IIIc alternatives would have greater potential to encounter contamination or acquire property on which hazardous or regulated materials are stored or used. A more detailed evaluation based on specific ROW needs would occur during the DCR/NEPA phase of project development.

8. *Section 4(f) and 6(f) Resources*

Section 4(f) of the U.S. Department of Transportation Act of 1966 states that the Secretary of Transportation:

> "...may approve a transportation program or project ... requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if ... there is no prudent and feasible alternative to using that land and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use" (49 U.S.C. 303[c]).

A "use" of a Section 4(f) resource, as defined in CFR Title 23, Part 771.135(p) occurs:

a) when property is permanently incorporated into a transportation facility;

b) when there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or

c) when there is a constructive use of a Section 4(f) property.

A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from a Section 4(f) resource but the project's proximity impacts are so severe

that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. For example, a constructive use can occur when:

a) the projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a property protected by Section 4(f);

b) the proximity of the proposed action substantially impairs aesthetic features or attributes of a property protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the property. Examples of such an effect would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or substantially detracts from the setting of a Section 4(f) property which derives its value in substantial part due to its setting; or

c) the project results in a restriction of access which substantially diminishes the utility of a significant publicly owned park, recreation area, or historic site.

A historic site is considered a Section 4(f) property if it is eligible for the National Register of Historic Places (NRHP) under Criterion A, B, or C if the site (A) is associated with events that have made a significant contribution to the broad patterns of our history, (B) is associated with the lives of persons significant in our past, or (C) embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction.

The Land and Water Conservation Fund Act (LWCFA) of 1965 regulates user fees at certain recreational areas and establishes a fund in the U.S. Department of the Treasury to subsidize governmental acquisition of lands and waters for recreational and conservation purposes (16 U.S.C. 4601-4 et seq.). Under Section 6(f) of the LWCFA, any conversion to non-recreational uses for recreational lands and waters that used LWCFA funds during facility acquisition, establishment, or improvements requires the prior approval of the National Park Service and Arizona State Parks.

a. Affected Environment

The study area, and a 0.25-mile buffer around the study area, was reviewed for significant historic sites and publicly owned parks, recreation areas, and wildlife and waterfowl refuges protected under Section 4(f). The 0.25-mile buffer accounts for potential constructive use impacts (i.e., noise and visual) that may extend outside of the study area. No wildlife or waterfowl refuges are in the study area. Appendix C provides a listing of properties that were preliminarily evaluated for Section 4(f) resource potential; the table includes parks, recreation areas, and historic properties. The table provides the location of the resource and its proximity to the project; the agency or owner having jurisdiction over the resource, features, and/or amenities; and whether the resource is recommended for protection under Section 4(f).

Numerous Section 4(f) parks, recreation areas, and historic sites are in the study area or within the 0.25-mile buffer around the study area (see Appendix C):

- Fifteen existing public parks and one planned park

- Eight existing linear paths or trials and 23 additional planned paths/trails
- Nine existing schools
- Twelve historic linear features (roadways, railroads, utilities)

Several properties are noted in Appendix C as "potential" Section 4(f) resources. Those properties would require additional coordination with the local official with jurisdiction over each property to determine whether they are of local significance. Determining the Section 4(f) eligibility of schools requires investigation into whether publicly owned school recreational facilities are available for public use, based on coordination with the district(s) having jurisdiction over the school. If school facilities are available for public use without prior authorization after school hours, then the school is afforded Section 4(f) protection. Even fenced schools would be considered Section 4(f) if their gates remain open.

A number of the potential sites are in the planning stage of development. Close coordination with the future owner/operators of these facilities (Pima County Natural Resources, Parks and Recreation, Tucson Parks and Recreation) would be prudent during the DCR/NEPA phase of project development. This could provide for opportunities to avoid the resources, minimize impacts, or ensure compatibility.

The historic properties that are also potentially Section 4(f) resources would require coordination with the official with jurisdiction, the Arizona State Historic Preservation Office (SHPO), and/or local preservation agencies to determine whether the property is locally important.

With the passage of Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users in 2005, Congress amended Section 4(f) requirements to allow the FHWA to approve a project that would result in a *de minimis* impact on a resource afforded protection under Section 4(f) without evaluation of avoidance alternatives typically required in a Section 4(f) Evaluation. The 2008 Section 4(f) Final Rule established procedures for determining when a direct use would result in a *de minimis* impact on the resource. As it relates to affected areas, the regulation (CFR Title 23, Part 774.17) defines a de minimis use as follows: "For parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact is one that will not adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f)." The FHWA would make a de minimis determination only after the public has been provided an opportunity to comment and the official with jurisdiction has submitted written concurrence.

A Section 4(f) evaluation report would document (1) coordination with local jurisdictions and, as warranted, stakeholders, (2) attempts to avoid the resources, (3) direct or constructive use impacts, (4) measures to minimize harm, and (5) any impacts from temporary occupancy of a Section 4(f) resource.

During the DCR/NEPA phase, any parks and other recreational facilities that could be impacted by I-10 or SR 210 improvements would be evaluated to determine whether LWCFA funds were used at the facilities.

b. Environmental Concerns and Recommendations for Further Analysis

i. I-10 (Junction I-19 to SR 83)

The first requirement when dealing with properties afforded Section 4(f) protection is to develop specific measures to minimize harm—avoidance being the preferred alternative. With the alternatives developed in the Feasibility Study, the potential to directly affect a Section 4(f) property is minimal. Proximity effects would need to be considered at several locations:

- *Paseo De Lupe Eckstrom Park (10th Avenue and I-10)*—The park includes the full array of park facilities: picnic tables/grills, ramadas, a multi-use path, ball courts, and a playground. Mainline widening on I-10 would move traffic lanes closer to the park. Noise impacts should be considered.
- *Kino Veterans Memorial Sports Complex (adjacent to I-10 east of Kino Parkway)*—The adjacent ball fields are only used as practice facilities for major and minor league baseball teams. Future use could include college and other non-professional teams. No general public use is allowed on the fields adjacent to I-10. Mainline widening on I-10 would move traffic closer to the baseball diamonds. Further discussion with Pima County Stadium District would be needed to determine whether the fields could be open for public use in the future.
- *Augie Acuña Park/Los Niños Elementary School (southeast quadrant of I-10/Alvernon Way)*—The park includes the full array of park facilities: picnic tables/grills, ramadas, a multi-use path, ball courts, baseball field, and a playground. The school is part of the Sunnyside Unified School District. At its nearest point, the park is about 230 feet from the current eastbound I-10 on-ramp. The school is about 540 feet from the eastbound ramp. The Alvernon TI interchange configuration under the System I alternative would add a second ramp and move the existing ramp about 50 feet closer to the park and school. Noise and visual impacts should be considered in the EA phase.

Through further study in the DCR/NEPA phase of project development, the alternatives would be analyzed for Section 4(f) direct use, constructive use, and, if warranted, measures to minimize harm to planned recreation facilities in proximity to the alternatives. In addition, if recreational lands that used LWCFA funds could be impacted by the I-10 alternatives, prior approval would be sought from the National Park Service and Arizona State Parks.

ii. SR 210 (Golf Links Road to I-10)

The first requirement when dealing with properties afforded Section 4(f) protection is to develop specific measures to minimize harm—avoidance being the preferred alternative. System I, System II, and System IV alternatives may conflict with long, linear historic features. However, neither of the features, the El Paso Natural Gas Line and the El Paso and Southwest Railroad, is recommended as a Section 4(f) resource. Under the System III alternative, it would not be feasible to avoid the Pima County Thomas Jay Regional Park and, therefore, the project would result in the direct use of the Section 4(f) resource. This impact is one of the reasons that the System III alternative was eliminated from further consideration. The System IIIc alternative would avoid the park. Through further study in the DCR/NEPA phase of project development, the alternatives would be analyzed for direct use, constructive use, and, if warranted, measures to minimize harm to planned recreation facilities in proximity to the alternatives.

As with the I-10 improvements, if recreational lands that used LWCFA funds could be impacted by the SR 210 alternatives, prior approval would be sought from the National Park Service and Arizona State Parks.

B. Socioeconomic Environment

1. Land Use, Ownership, and Jurisdiction

a. Affected Environment

The study area is within the city of South Tucson, the city of Tucson, and unincorporated Pima County, Arizona. Most adjacent lands are privately owned, with the exception of lands administered by the Arizona State Land Department (ASLD) and the DMAFB (Figure 9).

Nearby jurisdictions include San Xavier Indian Reservation (3.5 miles southwest) and the Saguaro National Park East (6.5 miles northeast of I-10).

The study area land use planning is directed by the City of South Tucson, the City of Tucson, and Pima County, Arizona. The *City of South Tucson, Arizona, Comprehensive Plan* (City of South Tucson 1999) The *City of Tucson General Plan* (City of Tucson 2001), and The *Pima County Comprehensive Plan Update 2012* (Pima County 2012) serves as the planning tools for growth and development in the study area and the surrounding region. Pima County is in the process of developing a 2015 plan, called Pima Prospers (Pima County 2014a).These plans, the Arizona Land Resource Information System (ALRIS 2014), and the Pima County Map Guide (Pima County 2014d) were used to determine existing land ownership, existing land use, and future land use within, and adjacent to, the corridor.

Land use is a representation of existing occupation and/or physical use of land. Existing land uses were verified using current Pima County and City of Tucson zoning data and aerial photography of the study area. Uses consist of rural, residential, commercial, industrial, recreational, governmental services, and Planned Area Development, which are master-planned communities that integrate mixed uses (Figure 10).

The study area can be characterized as urban from I-19 to Kolb Road, then suburban to rural beyond Kolb Road to SR 83. Commercial, industrial, and residential development occurs on both sides of I-10 in the urban section, with a few scattered undeveloped parcels. East of Kolb Road, adjacent development is limited to the University of Arizona Science and Research Park and low-density residential between Wentworth Road and SR 83.

Residential development abuts I-10 at several locations—in the 10th Avenue vicinity (north and south sides of I-10), Alvernon Way to Drexel Road (south side), Valencia Road (north and south sides), Craycroft Road to Wilmot Road (north side), Wilmot Road to Kolb Road (south side), and Wentworth Road to SR 83 (south side). Planned development adjacent to the I-10 study area is focused on state lands in the Houghton Road corridor and a large tract of primarily state lands south of I-10 between Wilmot Road and Houghton Road and east along I-10 to Wentworth Road, referred to as Rincon/Southeast Subregional Plan 1995, Revised 2005 (City of Tucson 2005).

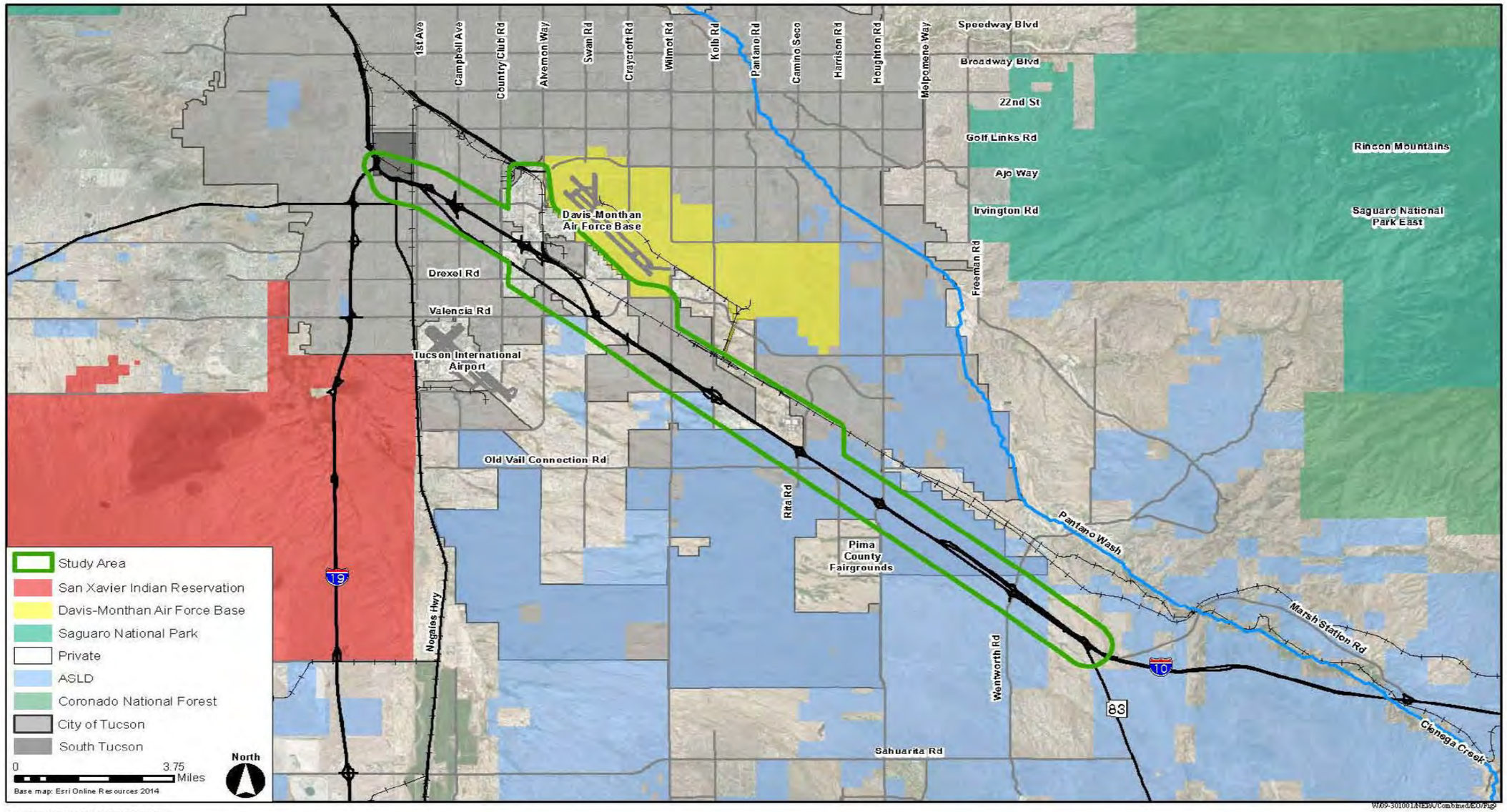

Figure 9. Land jurisdiction

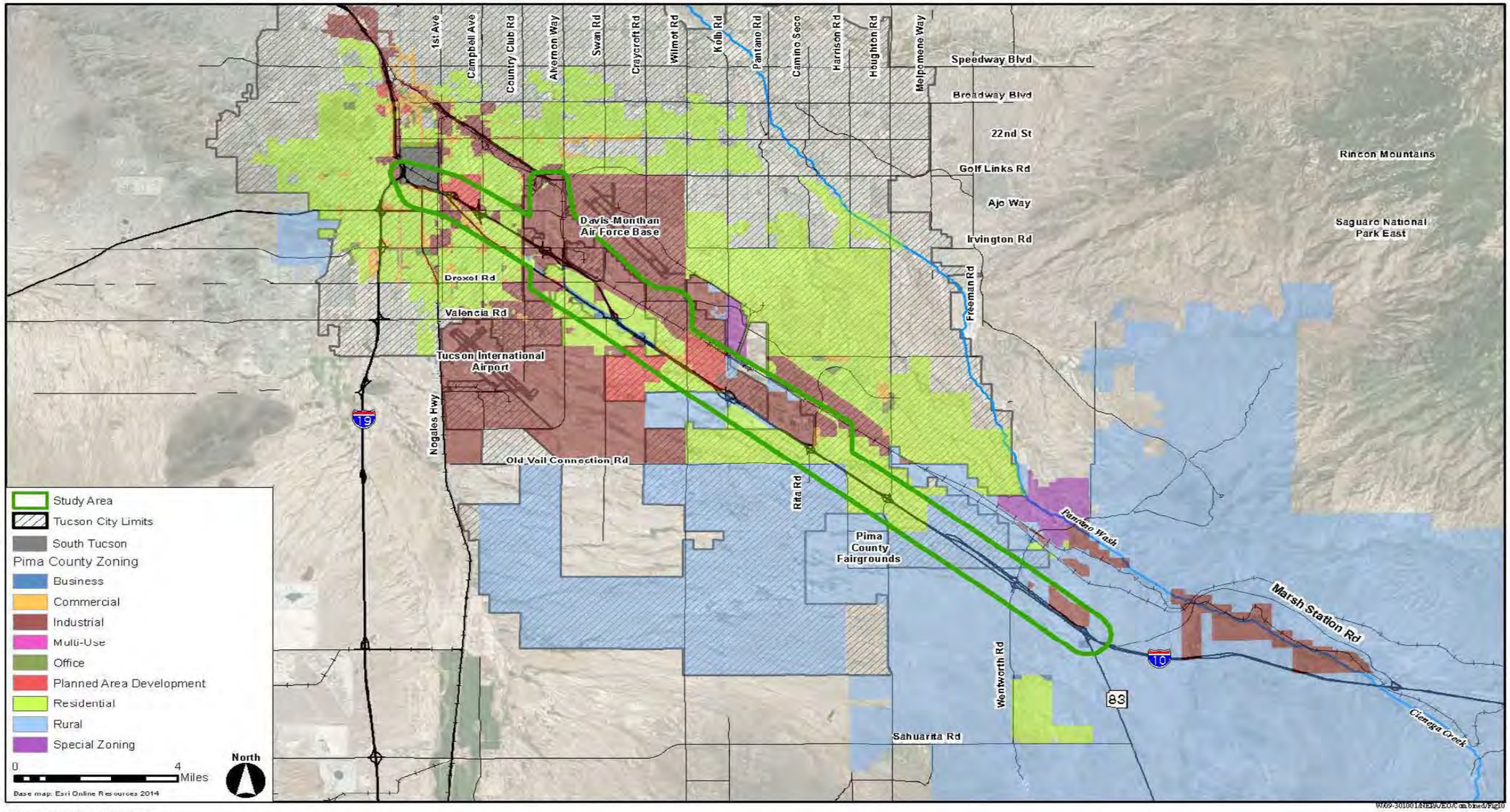

Figure 10. Current zoning

Commercial and industrial development is primarily along the western portion of the SR 210 study area, particularly adjacent to the DMAFB and within the City of Tucson limits. Residential development in this area is limited. East of the City of Tucson limits, most of the land is zoned as industrial or rural uses, and consists primarily of undeveloped desert and medium- to low-density residential development (Figure 10).

Manufacturing, business parks, and light industry dominate the Alvernon Way corridor of Systems I and IV. The UPRR essentially parallels Alvernon Way between I-10 and SR 210. The UPRR main switching and maintenance yard is just northwest of the study area. A bulk fuel oil storage facility (tank farm) occupies about 40 acres west of Alvernon Way, and the Tucson Electric Power Company–Irvington Station (TEP Station) is east of Alvernon Way at I-10. The area bounded by DMAFB, Alvernon Way/Contractors Way, and I-10 includes a number of auto and metal salvage operations, construction firms, and materials supply and moving/storage facilities. The western portion of the study area is a major employment center, including critical facilities that support the region (e.g., TEP Station, tank farm, UPRR).

The study area from the Valencia Road vicinity east is less developed. Land uses are more residential in nature, with subdivisions between Valencia Road and Kolb Road. Other uses include the Pima Air and Space Museum, the Army National Guard facility, the University of Arizona Science and Technology Park, two public schools, and Thomas Jay Regional Park. Undeveloped lands are generally in the vicinity of the Julian Wash floodplain.

b. Environmental Concerns and Recommendations for Further Analysis

i. <u>I-10 (Junction I-19 to SR 83)</u>

The improvements identified for the I-10 corridor would primarily have impacts at the new or reconfigured TIs. These impacts would include property acquisition and access changes but would not typically result in a zoning or land use change other than converting commercial property to transportation use. Along the I-10, mainline improvements would not be expected to alter any zoning or land use; however, additional noise abatement measures could be expected adjacent to residential areas.

Specific potential impact areas include:

- *I-10/Park Avenue TI*—The conversion to a standard diamond interchange would require acquisition of a motel in the southwest quadrant.
- *I-10/Kino Parkway TI*—The impacts would be balanced at this TI with the acquisition of new ROW and disposal of excess ROW. The new ROW would be on undeveloped property.
- *I-10/Country Club TI*—This new TI could eliminate a retail plant nursery in the northwest quadrant and acquire property from one or two large-lot residential properties in the southwest quadrant.
- *I-10/Palo Verde Road TI*—The removal of this TI could result in excess ADOT ROW for sale. Local business access would not be altered by the removal of the TI, but it would result in short, out-of-direction travel to several businesses on Irvington Road and Palo Verde Road.
- *I-10/Alvernon Way*—This TI is subject to two configurations—one for the System I alternative and another for the System II alternative. Under the System I and IV alternatives, new ROW impacts in the northwest quadrant would remove four or five of the eight buildings associated with a window manufacturer. The newly built solar warehouse facility in the southwest quadrant would be avoided. With the System II alternative, the window manufacturer would be avoided, and ROW acquisition would be minimal.
- *I-10/Valencia TI*—The existing TI would be retained; however, ramp adjustments in the southeast and northeast quadrants would encroach on a residential subdivision.
- *I-10/Craycroft TI*—The interchange configuration would be retained. The new truck stop in the northeast quadrant would be avoided.
- *I-10/Wilmot Road*—The interchange ramps would be realigned, requiring new ROW in the northeast and southwest quadrants. Though both quadrants are currently vacant, residential development is planned for the northeast quadrant as an expansion of an existing residential community.
- *I-10/Kolb TI*—The conversion of this interchange to a diverging diamond would require new ROW in all quadrants of the System I, II, and IV alternatives. A relocated two-way frontage road on the south side of I-10 would encroach on a recreational vehicle (RV) park. The land use adjacent to the I-10 frontage is RV storage; occupied units are set back about 500 feet from I-10.
- *I-10/Rita TI*—The conversion from a spread diamond to a tight diamond would require new ROW in all quadrants. All the subject land is undeveloped.
- *I-10/Houghton TI*—The conversion from a spread diamond to a diverging diamond would require new ROW in all quadrants for System I, II, and IV alternatives. All the subject land is undeveloped. Though the alternative plan sheets in the Feasibility Study depict the realignment of Houghton Road south of I-10 on a section line, the actual alignment that would be used would be determined during future evaluations. No development occurs near this TI.
- *I-10/Wentworth TI*—The alignment of Wentworth Road would be shifted to reduce the skew angle and realign ramps. This design would require new ROW from undeveloped land.
- *I-10/SR 83 TI*—The conversion from a trumpet interchange to a diamond interchange would require new ROW in all quadrants. The two-way frontage roads north and south of I-10 would be relocated. No new ROW would be required from developed property; however, the relocated south frontage road would be shifted closer to several large-lot residential properties. Noise impacts would be evaluated at this location.

ii. <u>SR 210 (Golf Links Road to I-10)</u>

All alternatives would affect commercial and industrial land uses along the Golf Links Road and Alvernon Way alignments. The System II alternative would have additional impacts on the commercial areas along Swan Road adjacent to the DMAFB and a planned residential area along Valencia Way. The System III alternatives would affect the same areas as the System II alternative and would be in close proximity to two public schools; this is one reason the System III alternative was eliminated from further consideration. System III would also impact a regional park and would be in close proximity to residential communities. Though all alternatives would affect existing land uses and require displacements of businesses and residents, the System I and IV alternatives would be expected to have the fewest displacements.

All alternatives would have substantial business impacts due to property acquisition and access changes at Golf Links Road and Alvernon Way. Due to the fully built-out commercial area at the current SR 210 terminus at Golf Links Road, new ROW in a commercial triangle bound by Alvernon Way, 34th Street, and SR 210 would require acquisitions of 10 to 15 local businesses, including auto repair, paint distribution, drywall, sign manufacturing, roofing, granite countertop, and building supply firms. Through access modifications, the potential impact could be reduced. Further analysis during the DCR/NEPA phase would be required.

The System I and IV alternatives would have additional impacts to businesses along Alvernon Way through acquisition for access changes. The most significant acquisition would be in the northwest quadrant of Alvernon Way and Irvington Road, where the eastbound SR 210 ramp to I-10 would cross through four or five buildings of a large window manufacturing company. The System II alignment along the DMAFB boundary is adjacent to dense commercial development between Contractors Way and the DMAFB. Impacts to 15 to 20 businesses could occur. These businesses tend to be on larger lots and include moving and storage, auto salvage, auto repair, construction materials, landscaping, and recycling firms. During the DCR/NEPA phase, additional analysis would be required to determine ROW needs.

Encroachment or acquisition of property from the DMAFB is of concern for security reasons. In addition, U.S. Customs and Border Protection (CBP) has built a new "seizure vault" (storage for seized contraband) near Irvington Road and the DMAFB boundary. CBP officials have indicated that the System II alternative alignment may pose a security risk to the facility and have recommended that the alignment be eliminated from further consideration (CBP 2011). The business impacts with Systems I and IV related to acquisition and access represent the greatest issue with the SR 210 project. The acquisition costs and the opportunity to relocate businesses in the vicinity would need to be investigated in the DCR/NEPA phase. Other than converting commercial property to transportation use, land use and zoning would not change. The SR 210 extension would be compatible with commercial/industrial uses. The limited residential land uses along the System I, System II, and System IV alternatives can be compatible with major transportation corridors with appropriate mitigation (noise abatement, ROW fencing, landscaping, and aesthetic features).

2. *Socioeconomics*

a. *Affected Environment*

Jurisdiction in the study area is split between unincorporated Pima County and incorporated City of Tucson and City of South Tucson. The county had a population of 996,554 in 2013, with 525,116 in Tucson and 5,696 in South Tucson (U.S. Census Bureau 2011). Pima County growth has been moderate since the 2000 Census, about 15 percent between 2000 and 2010. The growth in the cities of Tucson and South Tucson has been 9 to 11 percent over the same period. Projections by PAG indicate population growth to 718,187 in Tucson and 1,379,622 for the county by 2040. The study area is moderately populated, with residential subdivisions dispersed between I-19 and Kolb Road along I-10. In the SR 210 study corridor, residential development is light, with most residences near I-10.

Primary employment sectors of government, trade/transportation/utilities, and education are well represented in the study area. DMAFB, the largest employer in the city, is adjacent to the study

area. A broad variety of industrial/trade/commercial employment is adjacent to Alvernon Way and along the DMAFB boundary. More than 300 businesses are in the study area. Along I-10, commercial development is dominant, particularly at or near the TIs. The study area is ideally suited for industry and manufacturing due to the proximity of transportation services (UPRR and I-10) and Tucson International Airport (about 3 miles south of I-10). TEP has a major facility near Alvernon Way and Irvington Road in the study area. The U.S. Department of Defense Veterans Administration has a large medical facility just south of I-10 east of 6th Avenue. Several business parks are located throughout the study area. Education employment is represented at the University of Arizona Science and Technology Park and the four public schools in the study area. Two Pima County Sheriff's Department facilities and three fire stations are in the study area.

The residential neighborhoods in the study area are primarily adjacent to I-10 or Benson Highway. Neighborhood continuity is mixed as the subdivisions are scattered and separated by I-10 and undeveloped lands. The South Tucson community north of I-10 and the Littletown community north of I-10 between Craycroft and Wilmot roads exhibit a sense of continuity/cohesion. South Tucson is essentially a 1 square mile incorporated area completely surrounded by the City of Tucson. The community's Hispanic ethnic character is widely known through its restaurants, architecture style, and outdoor murals. The Littletown area is anchored by Lauffer Middle School, Craycroft Elementary School, Thomas Jay Regional Park, and Littletown Community Center, and is linked by the Julian Wash Greenway (linear park).

b. *Environmental Concerns*

i. <u>I-10 (Junction I-19 to SR 83)</u>

The I-10 improvements would result in few developed property acquisitions. Possible acquisitions include a motel at Park Avenue, a window manufacturer at Alvernon Way (related to the System I and System IV SR 210 alternatives), and a plant nursery at County Club Road. The majority of the I-10 ROW needs would be undeveloped property.

The improvements identified in the Feasibility Study for I-10 would not appear to represent a major economic impact in the corridor. The ability to relocate acquired businesses back into the I-10 corridor would limit possible job losses. Neighborhood continuity impacts would not appreciably increase beyond the current I-10 influence on neighborhoods. No property acquisition or substantive access change is anticipated in South Tucson.

As with all major construction projects, access during and after construction is likely to be of primary concern to residents and business owners. An aggressive public and business community involvement program is critical to minimize issues and assist businesses. ADOT has employed such programs with recent I-10 improvements in downtown Tucson and should incorporate a similar program for this project.

ii. <u>SR 210 (Golf Links Road to I-10)</u>

Though actual impacts cannot be determined until more detailed design and ROW needs are identified during the DCR/NEPA phase, it is anticipated that all of the SR 210 alternatives would result in business and residential acquisitions/relocations.

The reconfiguration of the SR 210/Alvernon Way/Golf Links Road connection is generally shared by the all alternatives and could require 15 to 20 business acquisitions as well as potential severance damage to several other parcels. One parcel in the area of this connection, near Alvernon Way and Technical Drive, contains three homes; this residential land use is not consistent with zoning and may be present by exception to the zoning. Access changes in the area could result in the acquisition of the parcel.

The System II and III alternatives could both affect an additional 15 to 20 businesses along the DMAFB border between Contractors Way and Irvington Road. Many of the businesses along the DMAFB border are auto salvage, materials storage, equipment yards, and construction contractors; on-site adjustments could limit the need for full acquisition. The System II and III alternatives may also encroach on DMAFB property, requiring considerable coordination with, and ultimately action by, the U.S. Department of Defense to approve encroachment or ROW acquisition.

Additionally, the System IIIc alternative could impact the existing Window Rock East and Julian Ranch residential subdivisions along the west side of Wilmot Road north of I-10; the La Estancia residential subdivision on the east side of Wilmot Road, north of I-10, in various stages of development; and the existing Desert Stone residential subdivision in the southeast quadrant of the I-10/Wilmot Road TI.

The possible impacts through full or partial business acquisitions and access changes represent a major impact and would require thorough communication and coordination with the City of Tucson, Pima County, and the business community. The impacts could result in job losses or relocation outside of the study corridor. A number of these businesses rely on an industrial setting with suitable rail and road access, separated from residential development or other sensitive land uses. Other economic implications may occur through loss of property or sales tax revenue if businesses cannot relocate in the area.

Due to the industrial development and major movement barriers of the DMAFB and the UPRR, little community cohesion is present today other than in the Littletown area. Impacts to neighborhood continuity/community cohesion would only be anticipated with the construction of the System IIIc alternative, which could represent an intrusion to the four aforementioned residential subdivisions. This intrusion contributed to the elimination of the System IIIc alternative.

As with all major construction projects, access during and after construction is likely to be of primary concern to residents and business owners. A comprehensive and proactive public and business community involvement program is critical to minimize issues and assist businesses. ADOT has employed such programs with recent I-10 improvement in downtown Tucson and should implement a similar program for this project.

3. Title VI/Environmental Justice

Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which was signed by President Clinton on February 11, 1994, directs that programs, policies, and activities identify and address, as appropriate, disproportionately high and adverse human health and environmental effects on minority and low-income populations.

Tables D-1 and D-2 in Appendix D summarize the demographic data obtained from Summary File 1 of the 2010 Census for the block groups of interest, the City of Tucson, and Pima County as a whole (U.S. Census Bureau 2011). Demographic data are included for racial and ethnic groups, total minority populations, persons 60 and older, disabled persons, persons living below the poverty level, and the number of households with a female head of household with children younger than 18 (U.S. Census Bureau 2012). Figure 11 depicts the study area Census tracts (CT). For environmental justice evaluations, a racial or ethnic minority population is an aggregate composed of the following categories: Black/African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Other Races, Two or More Races, and Hispanic. Table D-1 provides a breakdown of the percentage of each minority population category in each of the selected block groups and lists the aggregate of these minority populations.

a. Affected Environment

The 2010 Census data indicate that persons 60 or older (elderly residents), persons with disabilities, persons living below the poverty level, and households with a female head of household with children younger than 18 reside in the selected CTs (Table C-2). The percentages of these populations reflect concentrations that are lower than, similar to, or only moderately higher than those of the comparison populations of Tucson and Pima County.

Data from the 2010 Census indicate that minority populations live in the selected CTs. Thirteen of the 20 CTs have protected populations based on minority status. The percentage of total minority populations for CT 20, CT 21, CT 22.01, CT 22.02, CT 23, CT 24, CT 25.01, CT 36, CT 41.12, CT 41.15, CT 41.16, CT 41.17, and CT 41.21 indicates a population that is meaningfully higher than the corresponding percentages for Tucson and Pima County. Therefore, those 13 CTs are considered to contain protected populations.

b. Environmental Concerns and Recommendations for Further Analysis

i. <u>I-10 (Junction I-19 to SR 83)</u>

Potential effects on protected populations should be discussed as part of the environmental document prepared for this project during the DCR/NEPA phase. The environmental justice data should be updated during the preparation of the environmental document.

Generally, environmental justice would not be a substantive factor in determining the viability of improvements in this study corridor because no acquisition of residential property is anticipated. Impacts due to traffic noise or access changes could occur. The future DCR/NEPA phase would allow meaningful participation in the project development process by all residents, including low-income and minority populations.

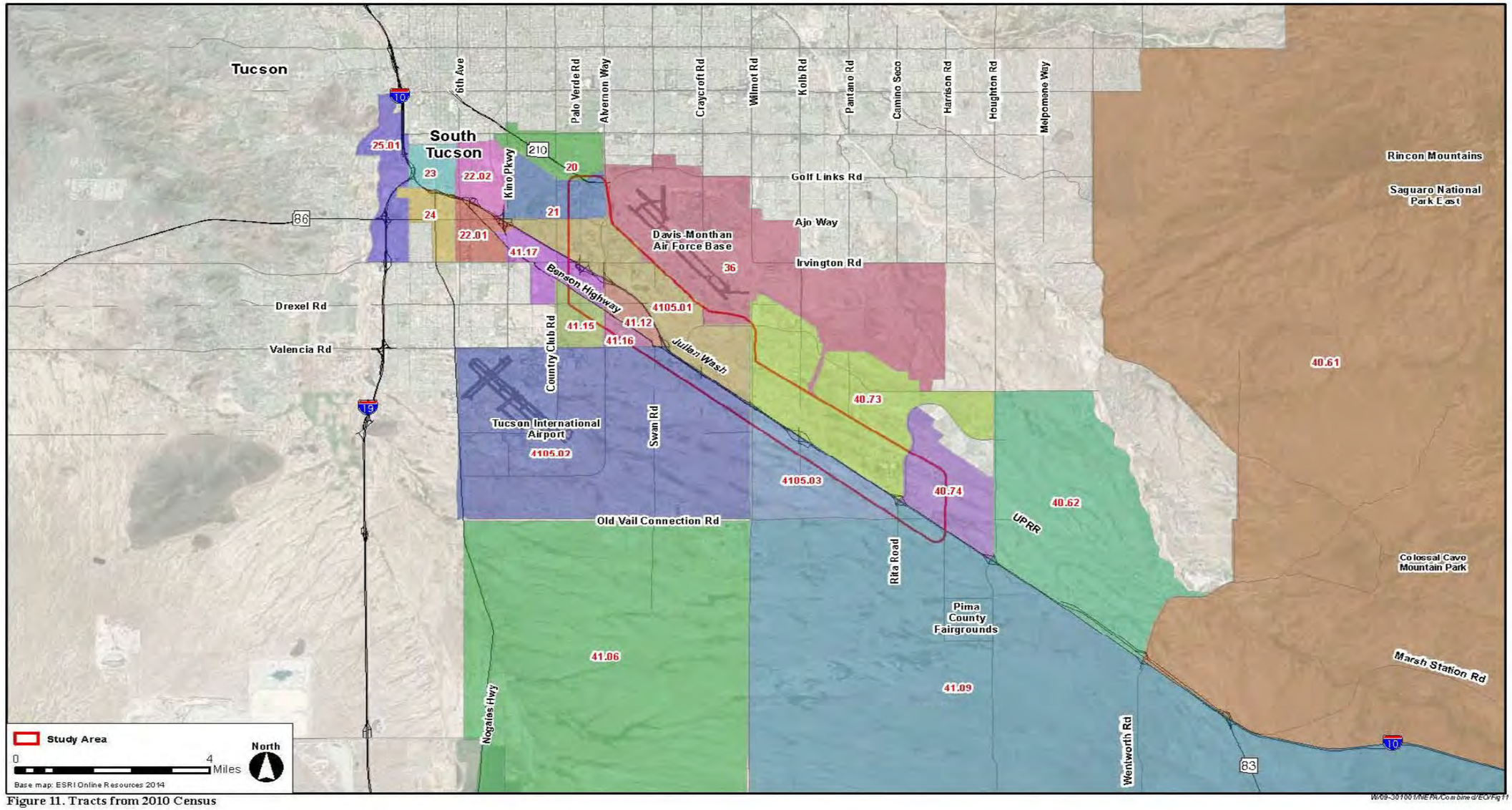

Figure 11. Tracts from 2010 Census

ii. SR 210 (Golf Links Road to I-10)

Potential effects on protected populations should be discussed as part of the environmental document prepared for this project during the DCR/NEPA phase. The environmental justice data should be updated during the preparation of the environmental document.

Generally, environmental justice would not be a substantive factor in determining the viability of alternatives in this study corridor. All alternatives could affect the isolated residential parcel near Alvernon Way and Technical Drive. Impacts due to traffic noise or access changes to businesses that may be minority-owned could occur. The System III alternative would be situated in close proximity to the Littletown community; avoidance of a potential environmental justice issue is one reason the alternative was eliminated from further consideration. The System IIIc alternative avoids the Littletown community. The future DCR/NEPA phase would allow meaningful participation in the project development process by all residents, including low-income and minority populations, and the business community.

4. *Visual Resources*

a. Affected Environment

The visual character of the study area varies from a highly developed urban/industrial setting in the northwest to large, open, undeveloped areas east of Kolb Road. No designated scenic roads/byways or land management agency visual analysis requirements are in the study area. East of Kolb Road, views are dominated by generally undeveloped terrain and mountain ranges. Much of the northwest and central portions of the study area are characterized by commercial/industrial development with large, multi-story commercial buildings and highly visible features, including the Veterans Memorial Hospital, TEP Station, and the DMAFB. The rural portion of the study area has more open land, with large, undeveloped areas interrupted by the railroad, residential subdivisions, and other dispersed developments (e.g., Pima Air Museum and the University of Arizona Science and Technology Park). I-10, the UPRR, and major overhead electrical transmission towers from the TEP facility are the dominant linear features along the study area. Sixteen grade-separated TIs are along I-10, and a bridge structure over SR 210 is at Palo Verde Road. The I-19/I-10 TI is a multi-level system interchange that occupies almost 80 acres.

Distant views are of the Rincon Mountains to the east, the Santa Catalina Mountains to the north, the Santa Rita Mountains to the south, and the Tucson Mountains to the west. The nearest of the mountain ranges are the Rincon Mountains, about 6 miles northeast of the study area. Vegetation in the undeveloped areas is sparse, with low shrubs and trees. Foreground and midrange views east of Kolb Road are generally of natural terrain.

b. Environmental Concerns and Recommendations for Further Analysis

i. I-10 (Junction I-19 to SR 83)

The proposed improvements in the I-10 mainline and TIs are consistent in scope and scale with the current facility and adjacent land uses. The I-10 study corridor does not have any adjacent land managed by the National Park Service, the U.S. Forest Service, or other land-managing agencies with visual guidelines or requirements. The Pima County SDCP (Pima County 2000) recognizes the connection between habitat conservation and visual quality. The eastern end of

the I-10 study corridor crosses high-priority conservation lands. Therefore, Pima County would be interested in limiting vegetation removal and aesthetic treatment/landscaping in the rural segment of the study area. A citizen interest group, "Friends of SR 83," would be concerned with visual impacts at the I-10/SR 83 TI. In general, impacts to visual resources would not be a substantive factor in determining viability of the I-10 improvements in the study corridor.

ii. SR 210 (Golf Links Road to I-10)

In general, implementation of any alternative would add to the existing human-made environment, but the new facilities would be of similar character to the existing setting. The System III alternatives would add an additional man-made feature through the generally undeveloped area between Swan Road and Wilmot Road. The proposed SR 210 extension could include the opportunity to apply aesthetic treatment to new bridge structures and landscaping in the new ROW. Impacts to visual resources would not be a substantive factor in determining viability of any SR 210 alternative in the study corridor.

5. *Right-of-Way*

a. Affected Environment

The existing ROW varies widely over the length (approximately 22 miles) of the I-10 corridor. Generally, the I-10 mainline ROW width is about 350 feet in the urban section. In the rural sections east of Kolb Road, the width expands to more than 1,000 feet due to split eastbound and westbound alignments from just east of Houghton Road to SR 83. The amount of ROW needed varies with the TI configuration. Due to existing loop ramp and spread diamond configurations at several TIs, the ROW footprint is varied. No ROW exists for the proposed extension of SR 210 other than the ROW present on the local street system (Alvernon Way/Swan Road).

b. Environmental Concerns and Recommendations for Further Analysis

i. I-10 (Junction I-19 to SR 83)

Detailed analysis of ROW needs would occur in the DCR/NEPA phase. All new ROW would appear to be privately owned or require an easement from the ASLD. Minimal new ROW for mainline widening appears to be required. The needs are primarily at TIs. ROW costs are expected to be a major factor in the TI design considerations during the DCR/NEPA phase.

ii. SR 210 (Golf Links Road to I-10)

The ROW width would generally be 200 feet along mainline sections of the parkway and would vary considerably at intersections and the connection to I-10. Portions of the new parkway could coincide with existing City of Tucson or Pima County roadways; therefore, an ownership transfer/purchase would need to occur.

Detailed analysis of ROW needs would occur in the DCR/NEPA phase. All alternatives would require the purchase of new ROW from private parties. Due to the "jigsaw" pattern of DMAFB property, portions of the System II and III alternatives could potentially require acquisition of land from the U.S. Department of Defense/DMAFB. The acquisition or encroachment on the base boundary is of concern to the DMAFB for security reasons and contributed to the elimination of all System III alternatives.

The System I and IV alternatives would require the least ROW acquisition because they would be the shorter route and would use existing public ROW. The System III alternatives would have required substantially more new ROW than the System I, System II, or System IV alternatives. ROW costs are expected to be a major factor in alignment selection in the DCR/NEPA phase.

6. *Utilities*

a. Affected Environment

The study area contains the full range of utilities expected in an urban community: water, wastewater, above- and below-ground power, above- and below-ground communications, and fuel oil/gas. Major electric power facilities originate out of the TEP Station near Alvernon Way and Ajo Way, a Kinder Morgan gas pipeline serves the fuel storage area near SR 210 and Alvernon Way, and an El Paso Natural Gas pipeline crosses the study area.

b. Environmental Concerns and Recommendations for Further Analysis

i. I-10 (Junction I-19 to SR 83)

Any improvements in the I-10 corridor would involve multiple utilities. During the DCR/NEPA phase, additional investigation into the degree of impacts and any needed relocation or service interruptions would be evaluated. Coordination with utility companies would occur during this phase.

ii. SR 210 (Golf Links Road to I-10)

Any improvements to extend SR 210 would involve multiple utilities. During the DCR/NEPA phase, additional investigation into the degree of impacts and any needed relocation or service interruptions would be evaluated. Coordination with utility companies would occur during this phase.

C. Cultural Resources

Cultural resources are properties that reflect the heritage of local communities, states, and nations. Properties judged to be significant and to retain sufficient integrity to convey that significance are termed "historic properties" and are afforded certain protection in accordance with state and federal legislation. The National Historic Preservation Act (NHPA) of 1966, as amended, defines historic properties as sites, buildings, structures, districts (including landscapes) and objects included in, or eligible for inclusion in, the NRHP, as well as the artifacts, records, and remains related to such properties. Traditional cultural properties having heritage value for contemporary communities (often, but not necessarily, Native American groups) also can be determined eligible for, and listed in, the NRHP because of their association with historic cultural practices or beliefs that are important in maintaining the cultural identities of such communities.

Section 106 of the NHPA requires federal agencies (in this case, the FHWA assisted by ADOT) to consider the potential effects of their undertakings on historic properties. Effects can be direct and result in physical alteration to the property, or indirect, as when the characteristics that qualify the property for NRHP listing are altered as a result of visual, auditory, or atmospheric intrusions.

To be considered eligible for listing in the NRHP, a property must meet at least one of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of our history
- Is associated with the lives of persons significant in our past
- Embodies the distinctive characteristics of a type, period, or method of construction or that represents the work of a master, or that possesses high artistic values, or that represents a significant distinguishable entity whose components may lack individual distinction
- Has yielded, or may be likely to yield, information important in prehistory or history

Archival research and record searches were conducted at the Arizona SHPO, the Arizona State Museum (ASM), Arizona State University Archaeological Research Institute, the AZSITE cultural resource database, the Arizona state and Tucson field offices of the Bureau of Land Management, the NRHP, the City of Tucson, General Land Office map plats, and the ADOT Historic Preservation Portal, as reported by Touchin and Whittlesey (2010). The results of the inventory are covered in two reports: *A Cultural Resources Class I Inventory for Interstate 10, from Interstate 19 to State Route 83, Pima County, Arizona* (ADOT 2011b) and *A Cultural Resources Class I Inventory for State Route 210 (Barraza-Aviation Parkway) Extension, Pima County, Arizona* (ADOT 2011c). Additional cultural surveys for local government or private development may have been undertaken since 2011; however, revising or updating the Class I Inventory reports for this EO update would have been of little value and was not initiated.

a. Affected Environment

The archival research and records searches identified more than 200 prior archaeological projects and nearly 100 previously recorded cultural resource sites in the study area. Known cultural resources include prehistoric archaeological sites, historic archaeological sites, archaeological sites with prehistoric and historic components, historic residential subdivisions, historic natural gas pipeline, historic railroad, historic-age streets, and a component of the Arizona Historic State Highway System as well as more than 60 vehicular bridges in the study area.

Properties eligible for listing on the NRHP vary from "determined" eligible, not eligible or, in some cases, eligibility recommendations have been offered by recorders, but no record of consultation was obtained. In other cases, agencies and SHPO have decided to consider properties as eligible or not eligible for consultation purposes. Therefore, those properties are identified as "recommended" or "considered" eligible or not eligible, respectively.

None of the archaeological sites previously identified in the study area is listed in the NRHP. SHPO has determined eligibility for 10 sites, and 30 other sites have been recommended or are considered eligible. A number of sites have not been formally evaluated for NRHP eligibility.

El Paso Natural Gas Pipeline reach 1007 (AZ AA:12:875 [ASM]) has previously been determined as NRHP-eligible under Criteria A, C, and D. Historic natural gas pipelines are exempt from consideration under Section 106.

The El Paso & Southwestern Railroad's Fairbank-Mescal-Tucson Route (AZ EE:3:74 [ASM]) was determined eligible for inclusion in the NRHP under Criteria A and D; however, the portion of the railroad alignment in the current study area, which was abandoned and salvaged in the 1960s, can be classified as a ruin and does not contribute to the overall eligibility of the historic railroad as a whole.

The historic alignment of U.S. Highway 80/SR 80 is recognized as a component of the Arizona Historic State Highway System, considered by ADOT, the FHWA, and SHPO to be eligible for inclusion in the NRHP under Criterion D. A portion of the historic highway is preserved in the study area as the in-use Benson Highway (Business 10). The remainder of the historic highway in the study area was subsumed by the construction of portions of I-10 in 1961, which becomes 50 years old, and therefore historic, in 2011. Effects to the interstate highway system are exempt from consideration under Section 106 unless they are designated as nationally and exceptionally significant features by the FHWA.

Eight historic vehicular roads that are not components of the Historic State Highway System have been reported in the study area. Each was recommended by its recorders as eligible for inclusion in the NRHP under Criterion A for its importance in the development of Historic Tucson.

Fifty-four vehicular bridges are reported in the study area. Most of the bridges are not yet 50 years old and therefore have not been assessed for eligibility. Fifteen bridges were previously determined not eligible. Only one frontage road bridge near MP 278.0 has been determined eligible for NRHP inclusion.

As project planning progresses, additional cultural resources inventory will likely be required. Efforts to arrive at definitive eligibility assessments, including assessing whether the portions of eligible properties subject to potential effects are contributing or non-contributing, also may be required. It is probable that an agreement document (a memorandum of agreement or a programmatic agreement) will be developed to demonstrate Section 106 compliance. When a preferred alternative is defined (assuming it is one of the build rather than no-build alternatives), the FHWA (assisted by ADOT) would need to determine what effect construction of that alternative will have on historic properties. The three possible effect determinations are "no historic properties affected," "no adverse effect," and "adverse effect."

Just because a historic property is on or near the preferred alternative does not necessarily mean that it will be subject to "adverse effect." Various strategies can be employed to completely avoid effects or to ensure that effects are minimized and therefore not adverse. If it is determined that historic properties would be adversely affected, it would be necessary to identify mitigation measures to ameliorate those effects to the extent possible. Such measures can include data recovery of archaeological sites and documentation of historic buildings and structures. If adverse effects to cultural resources valued for in-place preservation (typically those determined eligible under Criteria A, B, or C) cannot be avoided, a Section 4(f) alternatives evaluation would be required to explore the potential for a prudent and feasible alternative that would not result in a Section 4(f) use.

b. Environmental Concerns and Recommendations for Further Analysis

When project alternatives and an area of potential effects (APE) have been identified, impacts on historic properties would need to be evaluated. In addition, it would be necessary to conduct cultural resource surveys, according to current ASM guidelines, for all portions of the APE that have not been previously surveyed or that were surveyed prior to 2000. It would also be necessary to conduct a detailed review of ADOT as-built plans to determine whether bridges or culverts that are not listed in the *Arizona State Highway Bridge Inventory* are present within the APE and might be affected by the project.

The Section 106 compliance process for this undertaking may involve the following agencies and tribes:

- ADOT
- FHWA
- ASLD
- City of Tucson
- City of South Tucson
- Pima County
- U.S. Department of the Air Force
- UPRR
- Hopi Tribe
- Pascua Yaqui Tribe
- San Carlos Apache Nation
- Tohono O'odham Nation
- White Mountain Apache Tribe
- Yavapai-Apache Nation

i. <u>I-10 (Junction I-19 to SR 83)</u>

The I-10 improvements are coincident with or cross several linear historic features, including U.S. 80 (now I-10), El Paso Natural Gas Pipeline, El Paso and Southwestern Railroad, Old Sonoita Highway, Twin Buttes Railroad, and several historic local roads. The existing I-10 ROW has been surveyed; however, the proposed TI reconfigurations have not received full cultural survey. Therefore, additional sites could potentially be present. During the DCR/NEPA phase, further survey would occur to fully evaluate potential impacts.

ii. <u>SR 210 (Golf Links Road to I-10)</u>

All alternatives cross or connect to linear historic features: U.S. 80 (now I-10) and El Paso and Southern Railway (now UPRR). The specific alternative corridors have not received full cultural survey; therefore, additional historic or archaeological sites could be present. During the DCR/NEPA phase, further survey would occur to fully evaluate potential impacts and mitigation.

III. ENVIRONMENTAL OVERVIEW CONCLUSION

The evaluation of social, economic, and environmental resources in the study area identified a number of issues affecting the selection of viable alternatives evaluated in the Feasibility Study. Specifically, the EO analyses contributed to the elimination of the System III, IIIa, IIIb, and IIIc alternatives because they were determined to have potential "fatal flaw" impacts on social, economic, and environmental resources in the study area. As noted earlier in the EO, the System III alternatives would impact a 100-year floodplain, would be in close proximity to two public schools, would pose a potential environmental justice issue related to the community of Littletown, and would directly impact a Section 4(f) resource. Because viable alternatives to System III alternatives were identified, the System III alternatives will not be carried forward in the DCR/NEPA phase.

The System I, System II, and System IV alternatives for SR 210 extension routing and I-10 mainline widening and proposed TI configurations appear to merit further consideration in the DCR/NEPA phase, when more detailed analysis, stakeholder participation, and development of mitigation measures would occur. The environmental process would follow NEPA (42 U.S. Code 4321–4347) (NEPA 1970), as implemented by the Council on Environmental Quality (CFR Title 40, Part 1508.8), and FHWA guidelines (CFR Title 23, Part 771).

A. I-10 (Junction I-19 to SR 83)

The evaluation of the socioeconomic environment, physical and natural resources, cultural resources, and regulatory requirements conducted for I-10 indicates the proposed improvements from I-19 to SR 83 have no fatal flaws. The proposed improvements are located largely in or near the existing I-10 ROW. Impacts could occur with the TI connections to I-10 with the System I, System II, or System IV alternatives; however, those impacts are moderate, with residential displacements unlikely, few business displacements, and limited impact on cultural resources. Natural or physical resource impacts would be expected with widening and TI reconfigurations in the rural segment of the corridor.

The loss of vegetation, widening of drainage structures, and general addition of more travel lanes could be expected to affect wildlife. As noted earlier, a broad area from Houghton Road east beyond SR 83 has been identified by the USFWS, the AGFD, Pima County, and the City of Tucson as important to wildlife movement and/or conservation of plant and animal species. Project development in the DCR/NEPA phase has an opportunity to work with the agencies to avoid or mitigate natural resource impacts.

Noise impacts typical to interstate widening or TI reconstruction appear to have mitigation opportunities. The preparation of a noise report during the DCR/NEPA phase would identify specific areas affected. Changes in access or cross streets would require continued coordination with the local jurisdictions to minimize impacts.

B. SR 210 (Golf Links Road to I-10)

The evaluation of the socioeconomic environment, physical and natural resources, cultural resources, and regulatory requirements conducted for SR 210 indicates the extension from Golf Links Road to a connection with I-10 has some substantive environmental issues.

The issues related to the System III alternatives (100-year floodplain impacts, close proximity to two public schools, a potential environmental justice issue related to the community of Littletown, and a direct impact on a Section 4[f] resource) resulted in dropping those alternatives from further consideration in the DCR/NEPA phase. The issues related to the System I, II, and IV alternatives, while notable with regard to economic impacts, would not be considered fatal flaws to extending SR 210.

The greatest impacts to the study corridor would be in the form of potential business displacements and changes in access for the System I, II, and IV alternatives. A single residential parcel containing three homes amid industrial zoning would be displaced by all three alternatives. The System I and IV alternatives could require the relocation of approximately 15 to 20 businesses and access changes to several others, while the System II alternative could both require 30 to 40 business relocations and other access changes. Additionally, the System II alternatives may encroach on DMAFB property. During the DCR/NEPA phase, additional evaluation would be needed to determine actual impacts, and input from the public and stakeholders should be considered in the development of design options to minimize the impacts on businesses.

IV. COORDINATION

The Feasibility Study and the EO for I-10 (Junction I-19 to State Route 83) and SR 210 (Golf Links Road to I-10) were conducted in concert. Coordination with stakeholder agencies and team progress meetings were jointly held throughout the process.

A. Agency/Stakeholder Coordination

The initial project kickoff meeting was held on July 21, 2010, at the City of Tucson Fire Central Station. Participants included representatives from:

- FHWA
- ADOT
- PAG
- Pima County Department of Transportation
- Cochise County Highway and Flood Control Departments
- City of South Tucson

Due to the need to further evaluate the System IIIc alternative and introduction of a new alternative, System IV; the Feasibility Study was restarted on January 27, 2014, with a meeting at the ADOT Tucson District office. The participants included the same representative noted above plus representatives from the DMAFB, the AGFD, and the ASLD.

Team meetings were generally held on a regular basis at the ADOT Tucson District office, with a videoconference link to ADOT Phoenix Administration throughout 2011–2012. Project meetings resumed in 2014 and included website and phone-in links to allow participation from remote locations. The videoconference and web links provided for optimal participation in the meetings. Throughout the course of the meetings, additional stakeholder participants included:

- City of Tucson
- City of Benson
- Sun Tran
- CBP
- UPRR

The meetings were chaired by the ADOT Project Manager and Jacobs Engineering Group Inc. Agenda items were varied for each meeting, with a focus on soliciting input from the stakeholders. Presentations to the stakeholders provided data and graphics depicting existing conditions, LOS, operational issues, traffic modeling/forecasts, alternatives development, and environmental resource issues. Early discussions included the potential to enlarge the SR 210 study corridor farther west. The corridor was shifted west to Palo Verde Road. Preliminary traffic analysis indicated connection locations west of Alvernon Way would not generate substantive traffic relief on I-10; therefore, no alternatives using Palo Verde Road were developed.

Several stakeholder-focused discussions supplemented the monthly meetings, including:

- Sun Tran—August 22, 2010
- Utility companies—September 27, 2010 (TEP, Southwest Gas, El Paso Corporation, CenturyLink, Cox Communications, Level 3 Communications, X-Spedius Communications, Vail Water Company, Mescal Lakes Water System, and the City of Benson)
- AGFD—November 11, 2010
- UPRR—March 9, 2011
- PAG—April 6, 2011 (Feasibility Study concepts were presented to PAG as an agenda item during the regular PAG Transportation Planning Committee meeting; this was an information-only presentation; no action was taken by the committee)
- DMAFB, PAG, and Pima County Department of Transportation—March 14, 2012 (discussion of System IIIa, IIIb, and IIIc alternatives)
- Pima County Department of Transportation—January 14 and 21, 2014, and July 30, 2014
- City of Tucson—March 6, 2014
- PAG—April 7, 2014, and October 15, 2014 (presentation to Transportation Planning Committee)

All Feasibility Study materials were made available on the project website at www.jacobsaz.com.

B. Public Involvement

A public information meeting was held on October 6, 2011, at the Holiday Inn Hotel and Suites, 4550 S. Palo Verde Road, Tucson, Arizona. The meeting format was an open house with an informational video. Approximately 70 people attended and had the opportunity to talk to the ADOT team one-on-one at various display graphics. Most discussions revolved around business impacts, access, and schedule. The public was encouraged to remain active in the process as recommendations from the Feasibility Study would be carried forward in the DCR/NEPA phase. Attendees were added to the project mailing list and meeting information for this and future phases will be communicated through a study website, newspaper notice, and postcard, along with coordination with the media, elected officials, and agencies.

The following agencies were represented at the meeting: FHWA, ADOT, Pima County, PAG, the Regional Transportation Authority, DMAFB, and the City of Tucson. The meeting received news coverage through Fox News 11 and KVOA News 4.

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APPENDIX A

Mobile Source Air Toxics

A. Mobile Source Air Toxics

Mobile Source Air Toxics (MSATs) from highway vehicles and non-road equipment are the result of toxic compounds contained in fuel that are emitted into the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. Of the 93 MSATs that are listed in their Integrated Risk Information System (IRIS)[1], a subset of seven compounds has been designated by the U.S. Environmental Protection Agency (EPA) as priority MSATs and are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA)[2]. These are acrolein; benzene; 1,3-butadiene; diesel particulate matter plus diesel exhaust organic gases (diesel particulate emissions); formaldehyde; naphthalene; and polycyclic organic matter.

The EPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA has examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Based on a Federal Highway Administration (FHWA) analysis using the EPA's MOVES2010b model, as shown in Figure B-1, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same period. This is because future reductions realized by new cleaner burning vehicles operating on reformulated fuels would replace older vehicles and are anticipated to significantly offset future increases in emissions associated with a larger fleet size and increased VMT (FHWA 2012).

In February 2007, the EPA issued a final rule to reduce hazardous air pollutants from mobile sources. The final standards will lower emissions of benzene and other air toxics in three ways: (1) by lowering the benzene content in gasoline, (2) by reducing exhaust emissions from passenger vehicles operated at cold temperatures, and (3) by reducing emissions that evaporate from, and permeate through, portable fuel containers. Under this rule, the EPA is requiring that, beginning in 2011, refiners must meet an annual average gasoline benzene content standard of 0.62 percent by volume on all gasoline—the national benzene content of gasoline today is about 1.0 percent by volume. In addition, the EPA is adopting new standards to reduce non-methane hydrocarbon (NMHC) exhaust emissions from new gasoline-fueled passenger vehicles at colder temperatures below 75 degrees. NMHCs include many MSATs, such as benzene. Finally, the February 2007 rule establishes standards that will limit hydrocarbon emissions that evaporate or permeate through portable fuel containers such as gas cans.

[1] U.S. Environmental Protection Agency (EPA). 2014a. *Integrated Risk Information System (IRIS).* Website: http://cfpub.epa.gov/ncea/iris/index.cfm. Accessed February 15, 2014.

[2] EPA. 2014b. *Technology Transfer Network 1999 National-Scale Air Toxics Assessment.* Website: http://www.epa.gov/ttn/atw/nata1999/. Accessed February 15, 2014.

EPA expects that the new fuel benzene standard, and hydrocarbon standards for vehicles and gas cans, will together reduce total emissions of MSATs by 330,000 tons in 2030, including 61,000 tons of benzene. As a result of this rule, new passenger vehicles will emit 45 percent less benzene, gas cans will emit 78 percent less benzene, and gasoline will have 38 percent less benzene overall.

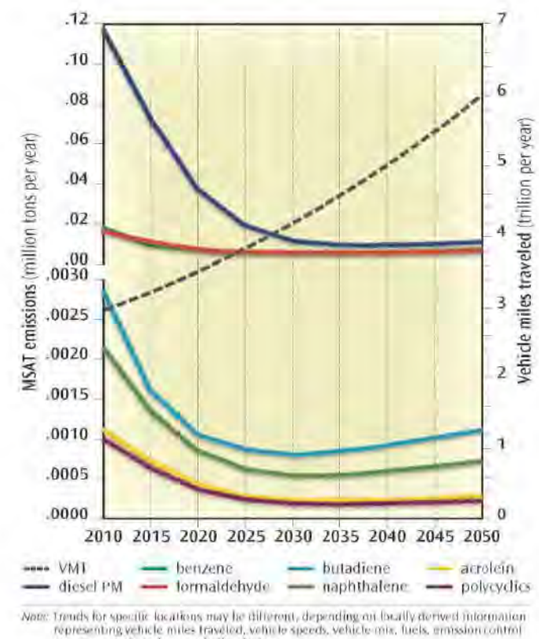


Figure A-1. Projected national MSAT emission trends, 2010 to 2050, for vehicles operating on roadways, using EPA's MOVES2010b model

The hydrocarbon reductions from the vehicle and gas can standards will reduce volatile organic compound emissions (which are precursors to O_3 [ozone] and can be precursors to $PM_{2.5}$) by more than 1 million tons in 2030. The vehicle standards should reduce direct $PM_{2.5}$ emissions by 19,000 tons in 2030 and could also reduce secondary formation of $PM_{2.5}$. Once the regulation is

fully implemented, EPA estimates that these PM (particulate matter) reductions will prevent nearly 900 premature deaths annually (EPA 2007).[3]

Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES improves upon the previous MOBILE model in several key aspects: MOVES is based on a vast amount of in-use vehicle data collected and analyzed since the latest release of MOBILE, including millions of emissions measurements from light-duty vehicles. Analysis of this data enhanced EPA's understanding of how mobile sources contribute to emissions inventories and the relative effectiveness of various control strategies. In addition, MOVES accounts for the significant effects that vehicle speed and temperature have on PM emissions estimates, whereas MOBILE did not. MOVES2010b includes all air toxic pollutants in NATA that are emitted by mobile sources. EPA has incorporated more recent data into MOVES2010b to update and enhance the quality of MSAT emission estimates. These data reflect advanced emission control technology and modern fuels, plus additional data for older technology vehicles.

The implications of MOVES on MSAT emission estimates compared with MOBILE are lower estimates of total MSAT emissions; significantly lower benzene emissions; and significantly higher diesel PM emissions, especially for lower speeds. Consequently, diesel PM is projected to be the dominant component of the emissions total.

MSAT Research

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of National Environmental Policy Act (NEPA).

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

B. Incomplete or Unavailable Information for Project-specific MSAT Health Impact Analysis

This environmental overview includes a basic analysis of the likely MSAT emission impacts of future projects in the study area. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with this study corridor. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality regulations (Code of Federal Regulations [CFR] Title 40, Part 1502.22[b]) regarding incomplete or unavailable information.

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, C-2 would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects."[4] Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations[5] or in the future as vehicle emissions substantially decrease.[6]

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific

[3] EPA. 2007. *Control of Hazardous Air Pollutants from Mobile Sources; Final Rule to Reduce Mobile Source Air Toxics*. Website: http://www.rapca.org/publications/Documents/EPA_MSAT.pdf. Accessed February 15, 2014.

[4] EPA. 2014a. *Integrated Risk Information System (IRIS)*. Website: http://cfpub.epa.gov/ncea/iris/index.cfm. Accessed February 15, 2014.

[5] Health Effect Institute (HEI). 2007a. *Mobile-Source Air Toxics: A Critical Review on the Literature on Exposure and Health Effects*. Website: http://pubs.healtheffects.org/view.php?id=282. Accessed on February 15, 2014.

[6] HEI. 2009. *A Special Report of the Institute's Panel on the Health Effects of Traffic-Related Air Pollution*. Website: http://pubs.healtheffects.org/view.php?id=306. Accessed on February 15, 2014.

location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA[7] and the HEI[8] have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Due to the limitations cited, a discussion such as the example provided in this appendix (reflecting any local and project-specific circumstances), should be included regarding incomplete or unavailable information in accordance with Council on Environmental Quality regulations [40 CFR 1502.22(b)]. The FHWA Headquarters and Resource Center staff Victoria Martinez (787) 766-5600 x. 231, Bruce Bender (202) 366-2851, and Michael Claggett (505) 820-2047, are available to provide guidance and technical assistance and support.

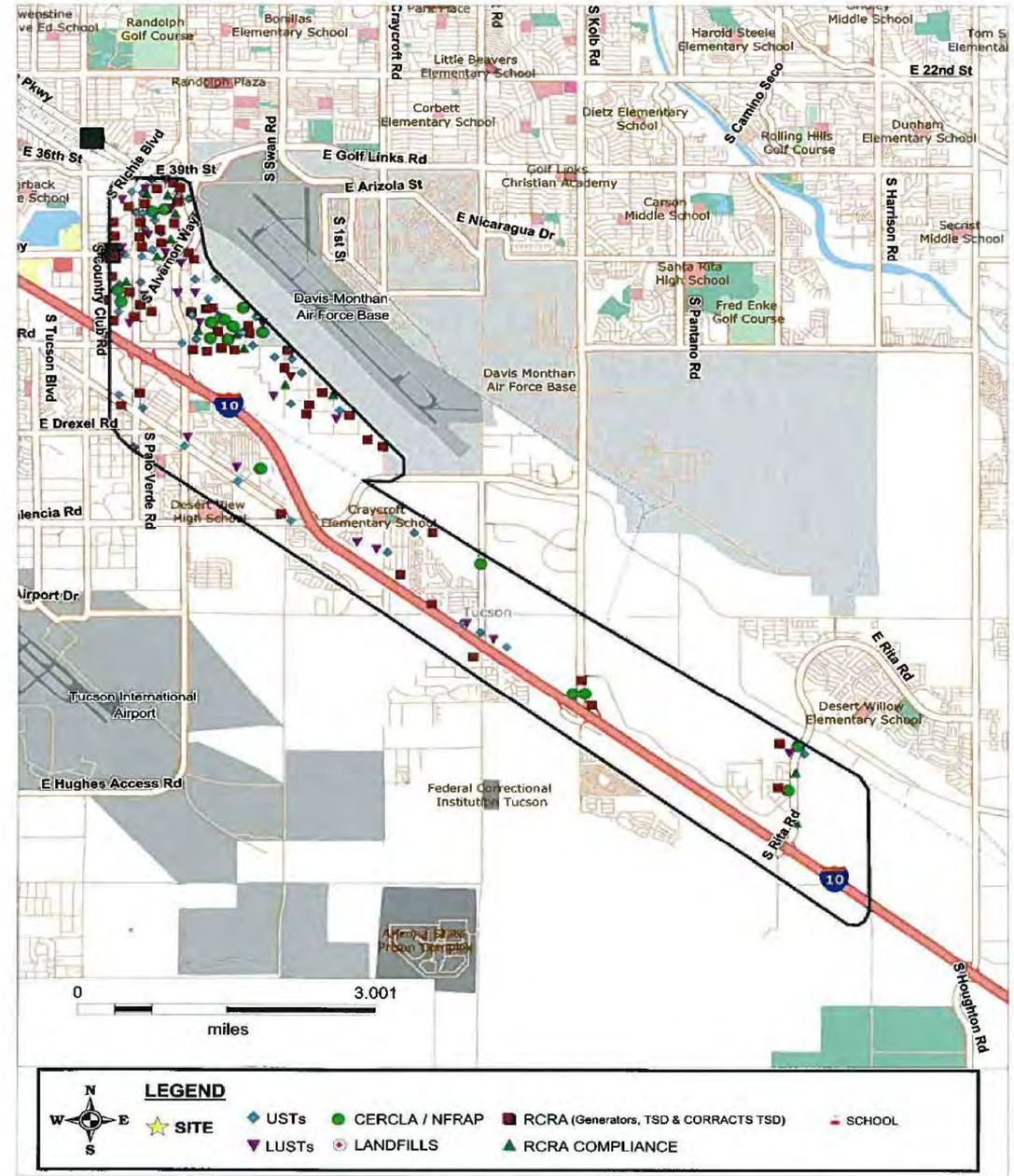
[7] EPA. 2012. *Where do I find risk assessments?* Website: http://www.epa.gov/risk/basicinformation.htm#g. Accessed February 15, 2014.

[8] HEI. 2007b. *Summary of Studies of Diesel Exhaust.* Website: http://pubs.healtheffects.org/getfile.php?u=395. Accessed February 15, 2014.

APPENDIX B

Hazardous Materials Features Maps

E Camp Lowell Dr
E Fort Lowell Rd
E Tanque Verde Rd
E Wrightstown Rd
E Grant Rd
E Pima St
E Speedway Blvd
E 6th St
E 5th St
E Broadway Blvd
E Aviation Pkwy
E 22nd St
E 36th St
E 39th St
E Arizola St
E Golf Links Rd
E Ajo Way
E Irvington Rd
E Escalante Rd
Davis-Monthan Air Force Base
E Drexel Rd
E Bilby Rd
W Valencia Rd
E Valencia Rd
E Old Spanish Trl
E Airport Dr
Tucson International Airport
E Hughes Access Rd
E Rita Rd
E Mary Ann Cleveland Way
E Colossal Cave Rd
E Marsh S
E Pima Mine Rd
E Andrada Rd
E Wetstones Rd
Sahuarita Rd
E Camino Del Toro
0
5.
miles
Scale: 1:161,600
LEGEND
SITE
USTs
LUSTs
CERCLA / NFRAP
LANDFILLS
RCRA (Generators, TSD & CORRACTS TSD)
RCRA COMPLIANCE
SCHOOL


Randolph Golf Course
Bonillas Elementary School
Little Beavers Elementary School
Harold Steele Elementary School
E 22nd St
Corbett Elementary School
Dietz Elementary School
Rolling Hills Golf Course
Dunham Elementary School
E 36th St
E 39th St
E Golf Links Rd
E Arizola St
Golf Links Christian Academy
Carson Middle School
E Nicaragua Dr
Secrest Middle School
Santa Rita High School
Fred Enke Golf Course
Davis-Monthan Air Force Base
Davis Monthan Air Force Base
E Drexel Rd
Desert View High School
Craycroft Elementary School
Tucson International Airport
E Hughes Access Rd
Federal Correctional Institution Tucson
Desert Willow Elementary School
E Rita Rd
0
3.001
miles
LEGEND
SITE
USTs
LUSTs
CERCLA / NFRAP
LANDFILLS
RCRA (Generators, TSD & CORRACTS TSD)
RCRA COMPLIANCE
SCHOOL

APPENDIX C

Possible Section 4(f) Property Inventory

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
1	Santa Cruz River Park	West of the I-10/ I-19 interchange; within 0.25-mile buffer around study area	Pima County Natural Resources, Parks and Recreation (PCPR)	American with Disabilities Act–accessible facilities, paved multi-use path, drinking water, equestrian access, exercise stations, playground, restrooms	Yes
2	John F. Kennedy Park–Fiesta	South 10th Avenue and West 34th Street; in study area	Tucson Parks and Recreation Department (TPR)	Grassy amphitheater with a stage and 18 permanent vendor booths	Potential[1]
3	Julian Wash Cultural History Walk	Southern quadrant of the I-10/ I-19 interchange; in study area	City of South Tucson Parks	Interpretive site with walking path, benches, displays, parking, bike racks, trash cans, shade structures, public art	Yes
4	Julian Wash Trail and Greenway	From the Santa Cruz River to the Houghton Greenway; traverses study area	PCPR; TPR; University of Arizona (UA)	Part of Tucson's Urban Loop; includes path and trail; the overall path is in various stages of planning and completion	Yes
5	Carmelin Castro Itom Usim Children's Park	South of West 39th Street between 10th Avenue and 12th Avenue; in study area	City of South Tucson Parks	Playgrounds, basketball court, multi-use path, lighting, pedestrian bridge, ramadas, picnic tables, grills, trash cans, public art	Yes
6	12th Avenue Trailhead for the Julian Wash Greenway	Southeast of South 12th Avenue and West 39th Street; in study area	PCPR; TPR; UA	Bike racks, playground, picnic ramada, water fountain, restrooms, parking	Yes
7	10th Avenue/ 12th Avenue Enhanced Corridor	Along the 10th and 12th Avenue alignments; traverses study area	TPR	Planned, undeveloped	Potential
8	Southgate Park	Northeast corner of South Belmar Avenue and West 43rd Street; in study area	PCPR	Amphitheater, bike racks, trash cans	Yes

[1] A recommended status of "potential" indicates additional coordination would be required to determine public availability, local importance, or other features worthy of a Section 4(f) determination.

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
9	Pueblo Magnet High School	3500 S. 12th Ave., in study area	Tucson Unified School District 1	Softball/baseball diamonds, soccer, tennis, pool, track with bleachers, fenced	Potential
10	El Paso & Southwestern Greenway	From north of downtown Tucson to the Kino Sports Complex; traverses study area	PCPR	Planned, partially developed, rails-to-trails greenway within the former El Paso & Southwestern Railroad right-of-way; public comment on Draft Master Plan ended in February 2011; portion in the study area not yet developed	Potential
11	Nellie P. Covert School	2700 S. 8th Ave., in study area	Arizona's Children Association	Ramadas, outdoor track, softball/ baseball diamond, basketball court, soccer field, pool, swings, water fountain; partially fenced	No; not publicly owned
12	Mission View Elementary School	2600 S. 8th Ave., in study area	Tucson Unified School District	Ramadas, picnic tables, basketball court, playgrounds, softball/baseball diamond, open fields, fenced	Potential
13	44th Street/ 6th Avenue Shared-Use Path	North of 44th Street and east of 6th Avenue; traverses study area	TPR	Paved, shared-use path	Potential
14	Wakefield Middle School	101 W. 44th St.; in study area	Tucson Unified School District 1	Soccer field, softball/baseball diamond, basketball court, outdoor track, ramada, picnic tables, grill; fenced	Potential
15	Wakefield Park	101 W. 44th St.; in study area	Tucson Unified School District 1/TPR	Ramada, picnic tables, grill, playground, basketball court, open to public on weekends	Yes
16	Street Scene Park	744 East 39th Street; within 0.25-mile buffer around study area	TPR	Picnic tables, playground, water fountain, grill, trash cans	Yes

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
17	El Paso Natural Gas Pipeline No. 1007 (AZ A:12:875 Arizona State Museum [ASM]; AZ AA:7:505 [ASM])	From West Ajo Way/South Clark Avenue to I-10 milepost (MP) 263.50; traverses study area	El Paso Natural Gas Co.	Historic underground natural gas pipeline determined eligible for the National Register of Historic Places (NRHP) under Criteria A and C; the portion in the study area is exempt from Section 106	No
18	Twin Buttes Railroad (AZ EE:1:300 [ASM])	Between South Fair Avenue and the existing Union Pacific Railroad (UPRR) alignment; traverses study area	Private	Historic railroad determined eligible for the NRHP under Criteria A and D	Yes
19	El Paso & Southwestern Railroad, Fairbank to Mescal to Tucson Route (AZ EE:3:74 [ASM]; AZ EE:3:43 [ASM]; AZ EE:3:58 [ASM]; AZ EE:3:62 [ASM]; AZ BB:13:577 [ASM]; AZ EE:4:17 Bureau of Land Management)	North of I-10 from MP 261.50 to MP 265.20; in study area	UPRR	Historic railroad determined eligible for the NRHP under Criteria A and D; the portion in the study area was determined noncontributing to the eligibility of the overall site	No
20	Kino Parkway Path	From Barraza/ Aviation Path to the Julian Wash Greenway along the Kino Parkway alignment; traverses study area	TPR	Planned, undeveloped	Potential
21	Shared-use path to Sam Lena Park	From east of Kino Parkway to the Kino Environmental Restoration Project Trail; in study area	TPR	Paved, shared-use path; spur providing connectivity between Julian Wash Trail and the recreation areas along Ajo Way east of Kino Parkway	Potential

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
22	Kino Veterans Memorial Sports Complex	2500 E. Ajo Way (the Kino Sports South Complex); in study area	Pima County Stadium District	Tucson Electric Park (major and minor league baseball; 11,000 seats); eight other baseball fields (some lighted), lighted soccer fields, batting cages, parking	Yes
23	Kino Environmental Restoration Project Trail	Northwest corner of Ajo Way and Country Club Road (within the Kino Sports North Complex); in study area	Pima County Stadium District	Walking trail, parking	Yes
24	Sam Lena Park/Kino Community Center/Kino Teen Center	Northwest corner of Ajo Way and Country Club Road (within the Kino Sports North Complex); within 0.25-mile buffer around study area	Pima County Stadium District	Ramadas, grills, two lighted softball/ baseball diamonds, playground, disc golf course, walking track, basketball court, batting/ pitching cages and tunnels, pool, walking path, trash cans, restrooms, drinking fountains, parking	Yes
25	Country Club Road (AZ B:13:688 [ASM])	Segment north of and adjacent to I-10; in study area	City of Tucson Department of Transportation (DOT)	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
26	Palo Verde Greenway	From the proposed Golf Links trails park to Julian Wash Greenway at Alvernon Way; traverses study area	TPR	Planned, undeveloped	Potential
27	Palo Verde Road Trail	From Palo Verde Greenway to Rodeo Wash Greenway along the Palo Verde Road alignment; traverses study area	TPR	Planned, undeveloped	Potential
28	Augie Acuña Los Niños Neighborhood Park	5432 S. Bryant Ave.; in study area	PCPR	Lighted baseball/ softball diamond, basketball court, tennis court, drinking fountains, trash cans, playground, ramadas with tables and grills, pool, bathrooms, concessions, parking	Yes

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
29	Los Niños Elementary School	5445 S. Alvernon Way; in study area	Sunnyside Unified School District 12	Playground, soccer field, open fields, basketball courts, ramadas; fenced	Potential
30	Alvernon Way (AZ B:13:690 [ASM])	Segment intersecting East Drexel Road; in study area	Pima County DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
31	Columbus Boulevard (AZ BB:13:689 [ASM])	Segment intersecting South Rex Strav; in study area	Pima County DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
32	Catalina Road (AZ B:13:687 [ASM])	Segment south of East Rex Street; in study area	Pima County DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
33	Herpa Street (AZ B:13:686 [ASM])	Segment south of East Rex Street; in study area	Pima County DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
34	Benton Avenue (AZ B:13:685 [ASM])	Segment south of East Rex Street; in study area	Pima County DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
35	Swan Road Greenway	From the Rodeo Wash Greenway to Sahuarita Road east of the Swan Road alignment; traverses study area	TPR	Planned, undeveloped	Potential
36	Rancho Valencia North Greenway	East of the Swan Road Greenway and south of I-10; in study area	TPR	Planned, undeveloped	Potential
37	Rodeo Wash Greenway	From the Santa Cruz River Park to the Wilmot Road; traverses study area	TPR	Planned, partially developed; portion in the study area not yet developed	Potential
38	Rancho Valencia Park	4818 E. American Beauty Drive; in study area	Valstate Homeowners Association (HOA)	Ramada, picnic tables, grills, playground, multi-use field; not fenced; no signs restricting use	No; not publicly owned
39	Rancho Valencia Park	6648 S. Plantain Place; in study area	Valstate HOA	Ramada, picnicking, grills, playground, multi-use field; not fenced; no signs restricting use	No; not publicly owned

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
40	The Villas at Rancho Valencia Common Area B (recreation area)	5049 E. Fairy Duster Drive; within 0.25-mile buffer around study area	Valstate HOA	Basketball court, volleyball court, parking, ramada, picnic tables, grill, bike rack, playground, multi-use field, drinking fountain, walking path; not fenced; no signs restricting use	No; not publicly owned
41	The Villas at Rancho Valencia Common Areas B and C (recreation area)	East Fairy Duster Drive and South Parsip Lane; in study area	Valstate HOA	Basketball court, picnic table, grill, trash cans, water fountain, playground; not fenced; no signs restricting use	No; not publicly owned
42	The Villas at Rancho Valencia Common Area B (recreation area)	East Desert Straw Lane and South Spring Beauty Way; in study area	Valstate HOA	Playground, ramada, picnic tables, grill, bike rack; not fenced; no signs restricting use	No; not publicly owned
43	Craycroft Road (AZ B:13:693 [ASM])	Segment intersects with East Rex Stray; in study area	Pima County DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
44	Billy Lane Lauffer Middle School	5385 E. Littletown Road; in study area	Sunnyside Unified School District 12	Softball/baseball diamond, basketball courts, soccer fields, volleyball, ramada; fenced	Potential
45	Craycroft Elementary School	5455 East Littletown Road; in study area	Sunnyside Unified School District 12	Basketball court, sand pit, ramadas, open fields, playground; fenced	Potential
46	Thomas Jay Regional Park	6465 S. Craycroft Road; within 0.25-mile buffer around study area	PCPR	Baseball/softball fields (lighted), senior baseball field, t-ball field, batting cages, basketball courts (lighted), drinking water, picnic tables, playgrounds, ramadas, grills, restrooms, concessions, parking, Littletown Community Center	Yes
47	Corazon del Pueblo Common Area A	East Calle de la Apertura; in study area	Habitat for Humanity Tucson, Inc.	Playground, shade ramada, picnic table, trash can; not fenced; no signs restricting use	No; not publicly owned

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
48	Corazon del Pueblo Common Area A	South Camino de la Humanidad and East Elvira Road; in study area	Habitat for Humanity Tucson, Inc.	Playground; not fenced; no signs restricting use	No; not publicly owned
49	Corazon del Pueblo Common Area A	East Camino del Agua; in study area	Habitat for Humanity Tucson, Inc.	Playground; not fenced; no signs restricting use	No; not publicly owned
50	Canterbury Ranch Common Area A	South Parsons Tale Drive; in study area	Canterbury Ranch HOA	Playground; not fenced; no signs restricting use	No; not publicly owned
51	Canterbury Ranch Common Area B	South Millers Tale Drive; in study area	Canterbury Ranch HOA	Playground; not fenced; no signs restricting use	No; not publicly owned
52	Window Rock East Recreation and Open Space	South 2nd Mesa Drive; in study area	Window Rock East HOA	Pool, playground, basketball court, clubhouse; recreation area is fenced; community is gated	No; not publicly owned
53	Wilmot Road (AZ B:13:661 [ASM])	Segment south of I-10; in study area	City of Tucson DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
54	Wilmot Road Trailhead for the Julian Wash Greenway	South Wilmot Road north of I-10; in study area	PCPR; TPR; UA	Planned, undeveloped	Potential
55	Robert A. Price, Sr. Park	South Wilmot Road and East Via Rio Pico; in study area	TPR	Planned, undeveloped	Potential
56	La Estancia de Tucson Linear Park	Between South Wilmot and South Kolb roads north of I-10; in study area	TPR	Walking path parallel to Julian Wash	Yes
57	Wilmot Road Greenway	From Julian Wash Greenway to Sahuarita Road east of the Wilmot Road alignment; traverses study area	TPR	Planned, undeveloped	Potential
58	Gas Line Trail	From Wilmot Road to the Pima-Cochise county boundary north of and parallel to I-10; traverses study area	TPR	Planned, undeveloped	Potential

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
59	Desert Stone Common Area B (recreation area)	South Wilmot Road between East Garden Stone and East Sentinal Stone drives; in study area	Desert Stone HOA	Ramadas, picnicking, grills, trash cans, basketball court, playground, multi-use fields; not fenced; no signs restricting use	No; not publicly owned
60	Vista Montana Estates Common Area B (recreation center)	East Stadium Parkway; in study area	Vista Montana Estates HOA	Pool, community center, basketball court, volleyball court, picnic, playground; recreation area for residents only; community is gated	No; not publicly owned
61	Airport Wash North Fork Trail	From Alvernon Way to Sarnoff Drive; traverses study area	TPR	Planned, undeveloped	Potential
62	Kolb Road Path	From Valencia Road to Julian Wash Greenway; in study area	TPR	Planned, undeveloped	Potential
63	Kolb Road Trailhead for the Julian Wash Greenway	Kolb Road north of I-10; in study area	PCPR; TPR; UA	Planned, undeveloped	Potential
64	Kolb South Greenway	From Julian Wash Greenway to 1 mile south of Old Vail Road; traverses study area	TPR	Planned, undeveloped	Potential
65	Julian Basin Trails Park	Kolb Road north of I-10; in study area	PCPR	Planned for the existing retention basin east of Kolb Road; undeveloped	Potential
66	Trails West Mobile Home Park	8401 S. Kolb Road; in study area	Trails Associates, LLC	Pools, community center, park, pond; no public access	No; not publicly owned
67	Voyager RV Resort	8701 South Kolb Road; in study area	Voyager RV Resort, LLC	Golf course, tennis courts, softball/ baseball diamond; golf course open to the public; privately owned	No; not publicly owned
68	Sarnoff Road Alignment Greenway	From Julian Wash Greenway to Sahuarita Road east of the Sarnoff Road alignment; traverses study area	TPR	Planned, undeveloped	Potential

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
69	Vail Academy and High School	7762 East Science Park Drive; in study area	Vail School District	Basketball court, fabric ramadas, playgrounds, water fountains, open baseball fields, fenced	Potential
70	UA Tech Park Recreation Center	9070 S. Rita Road; in study area	UA	Basketball court, tennis courts, softball/baseball diamonds, open playing fields, ramadas, walking path, recreation center; fenced; private recreational facility for employees and families of the Tech Park; site not open to the public	No; not open to the public
71	Old Vail/ Harrison Road Greenway	From the Old Vail Road/UPRR intersection to Franco Wash via Harrison Road, traverses study area	TPR	Planned, undeveloped	Potential
72	Houghton Greenway	From Tanque Verde Creek to Camino Aurelia east of the Houghton Road alignment; traverses study area	PCPR	A planned, undeveloped part of Tucson's Urban Loop, it will include a path and a trail east of the road; currently under design	Potential
73	Houghton Road Greenway and Julian Wash Trailhead	North of I-10; within 0.25-mile buffer around study area	PCPR	A planned, undeveloped part of Tucson's Urban Loop; currently under design	Potential
74	Southeast Regional Park	11296 S. Harrison Road; within 0.25-mile buffer around study area	PCPR	Shooting range	Yes
75	Pima County Fairgrounds	11300 S. Houghton Road within 0.25-mile buffer around study area	Pima County	Fairgrounds; function is primarily for commercial purposes	No
76	Powerline Path	From Pantano Wash Trail to Gas Line Trail; traverses study area	PCPR	Planned, undeveloped	Potential
77	Bridge No. 01020	I-10 frontage road at MP 277.90; in study area	Arizona DOT	Historic bridge determined eligible for the NRHP under Criteria A and C	Yes

Table C-1. Possible Section 4(f) resources in the I-10, I-19 to SR 83 study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
78	Acacia Elementary School	12995 E. Colossal Cave Road; within 0.25-mile buffer around study area	Vail School District	Playgrounds, basketball courts, soccer field; fenced	Potential
79	Old Vail Road (AZ B:13:725 [ASM])	Segment north and south of I-10 at MP 279.37; traverses study area	Pima County DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
80	Wentworth Road Path	From Pantano Wash Trail to Powerline Greenway via Wentworth and Colossal Cave Roads; traverses study area	PCPR	Planned, undeveloped	Potential
81	Wentworth Road Trail	From Pantano Wash Trail to Powerline Greenway via Wentworth and Colossal Cave roads; traverses study area	PCPR	Planned, undeveloped	Potential
82	Trail 071	Parallels Wentworth Road; within 0.25-mile buffer around study area	Private	Single-track trail	No; on privately owned land
83	Powerline Greenway	From Houghton Road to SR 83; traverses study area	Private; Arizona State Land Department (ASLD)	Planned, undeveloped	Potential
84	Sonoita Greenway	From I-10 to Sahuarita Road west of the SR 83 alignment; traverses study area	PCPR	Planned, undeveloped	Potential
85	Trail 278	Extends east from SR 83 south of the I-10 traffic interchange; traverses study area	Private; ASLD	Single-track trail	No; on privately owned land
86	Trail 275	Extends east from SR 83 south of the I-10 traffic interchange; traverses study area	Private; ASLD	Single-track trail follows alignment of Old Sonoita Highway	No; on privately owned land
87	Trail 066	Extends northeast parallel to East Marsh Station Road from within 0.25-mile buffer around study area	Private	Single-track trail	No; on privately owned land

Table C-2. Possible Section 4(f) resources in the SR 210, Golf Links Road to Eastern Termini study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
1	Country Club Park	3300 E. Aviation Highway; in 0.25-mile buffer around study area	Tucson Parks and Recreation Department (TPR)	Picnic tables, grills, playground, sports fields, softball/baseball diamond, sandbox, volleyball, lights, trash cans, parking	Yes
2	New World Care Emergency Relief Center (formerly Keen Elementary School)	3538 E. Ellington Place; in 0.25-mile buffer around study area	World Care	Playground, fields, ramadas; fenced	No; not publicly owned
3	Barraza/ Aviation Path	North of and parallel to the Barraza-Aviation Parkway from 4th Avenue to Golf Links Road; traverses study area	TPR	Paved, shared-use path	Potential[1]
4	Golf Links Trails Park	North of SR 210-Golf Links Road traffic interchange; in 0.25-mile buffer around study area	TPR	Planned; undeveloped	Potential
5	El Paso & Southwestern Greenway	From north of downtown Tucson to the Kino Sports Complex; traverses 0.25-mile buffer around study area	Pima County Natural Resources, Parks and Recreation; (PCPR)	Planned, partly developed, rails-to-trails greenway within the former El Paso & Southwestern Railroad right-of-way; public comment on Draft Master Plan ended in February 2011; portion in the study area not yet developed	Potential
6	Palo Verde Greenway	From the proposed Golf Links trails park to Julian Wash Greenway at Alvernon Way; in study area	TPR	Planned, undeveloped	Potential

[1] A recommended status of "Potential" indicates additional coordination would be required to determine public availability, local importance, or other features worthy of a Section 4(f) determination.

Table C-2. Possible Section 4(f) resources in the SR 210, Golf Links Road to Eastern Termini study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
7	El Paso Natural Gas Pipeline No. 1007 (AZ AA:12:875 [Arizona State Museum (ASM)])	From West Ajo Way/East Michigan Street to South Rosemont Avenue; traverses study area	El Paso Natural Gas Co.	Historic underground natural gas pipeline determined eligible for the National Register of Historic Places (NRHP) under Criteria A and C; the portion in the study area is exempt from Section 106	No
8	El Paso & Southwestern Railroad, Fairbank to Mescal to Tucson Route (AZ EE:3:74 [ASM]; AZ EE:3:43 [ASM]; AZ EE:3:58 [ASM]; AZ EE:3:62 [ASM]; AZ BB:13:577 [ASM]; AZ EE:4:17 [Bureau of Land Management])	North of I-10 from milepost (MP) 261.50 to MP 265.20; traverses study area	Union Pacific Railroad	Historic railroad determined eligible for the NRHP under Criteria A and D; the portion in the study area was determined noncontributing to the eligibility of the overall site	No
9	Palo Verde Road Trail	From Palo Verde Greenway to Rodeo Wash Greenway along the Palo Verde Road alignment; traverses study area	TPR	Planned, undeveloped	Potential
10	Julian Wash Trail and Greenway	From the Santa Cruz River to the Houghton Greenway; traverses study area	PCPR TPR; University of Arizona (UA)	Part of Tucson's Urban Loop; includes a path and a trail; the overall path is in various stages of planning and completion	Yes
11	Los Niños Elementary School	5445 S. Alvernon Way; in study area	Sunnyside Unified School District 12	Playground, soccer field, open fields, basketball courts, ramadas, fenced	Potential

Table C-2. Possible Section 4(f) resources in the SR 210, Golf Links Road to Eastern Termini study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
12	Augie Acuna Los Niños Neighborhood Park	5432 S. Bryant Ave.; in study area	PCPR	Lighted baseball/softball diamond, basketball court, tennis court, drinking fountains, trash cans, playground, ramadas with tables and grills, pool, bathrooms, concessions, parking	Yes
13	Chaparral Middle School	3700 E. Alvord Road; in study area	Sunnyside Unified School District 12	Basketball courts, softball/baseball diamonds, soccer fields, tennis courts (in disrepair), outdoor track, football field, ramadas, picnic tables, water fountain; fenced	Potential
14	Gallego Basic Elementary School	6200 S. Hemisphere Place; in 0.25-mile buffer around study area	Sunnyside Unified School District 12	Softball/baseball diamonds, soccer fields playgrounds, open playing fields, fenced	Potential
15	Desert View High School	4101 E. Valencia Road; in 0.25-mile buffer around study area	Sunnyside Unified School District 12	Lighted softball/baseball diamonds, tennis courts, racquetball courts, outdoor track, lighted football field, lighted soccer field, basketball courts, bleachers; fenced	Potential
16	Desert Vista Terrace Common Area C (recreation area)	Northeast corner of South Columbus Boulevard and East Mesquite Desert Trail; in 0.25-mile buffer around study area	Desert Vista Terrace Homeowners' Association (HOA)	Basketball court	No; not publicly owned
17	Benton Avenue (AZ BB:13:685 [ASM])	Segment south of East Rex Street; in study area	Pima County Department of Transportation (DOT)	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
18	Swan Road Greenway	From the Rodeo Wash Greenway to Sahuarita Road east of the Swan Road alignment; traverses study area	TPR	Planned, undeveloped	Potential
19	Rancho Valencia North Greenway	East of the Swan Road Greenway and south of I-10; in study area	TPR	Planned, undeveloped	Potential

Table C-2. Possible Section 4(f) resources in the SR 210, Golf Links Road to Eastern Termini study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
20	Rodeo Wash Greenway	From the Santa Cruz River Park to Wilmot Road; traverses study area	TPR	Partially developed; planned; portion in the study area not yet developed	Potential
21	Rancho Valencia Park	4818 E. American Beauty Drive; in study area	Valstate HOA	Ramada, picnic tables, grills, playground, multi-use field; not fenced; no signs restricting use	No; not publicly owned
22	Rancho Valencia Park	6648 S. Plantain Place; in study area	Valstate HOA	Ramada, picnicking, grills, playground, multi-use field; not fenced; no signs restricting use	No; not publicly owned
23	The Villas at Rancho Valencia Common Area B (recreation area)	5049 E. Fairy Duster Drive; in 0.25-mile buffer around study area	Valstate HOA	Basketball court, volleyball court, parking, ramada, picnic tables, grill, bike rack, playground, multi-use field, drinking fountain, walking path; not fenced; no signs restricting use	No; not publicly owned
24	The Villas at Rancho Valencia Common Areas B and C (recreation area)	East Fairy Duster Drive and South Parsip Lane; in study area	Valstate HOA	Basketball court, picnic table, grill, trash cans, water fountain, playground; not fenced; no signs restricting use	No; not publicly owned
25	The Villas at Rancho Valencia Common Area B (recreation area)	East Desert Straw Lane and South Spring Beauty Way; in study area	Valstate HOA	Playground, ramada, picnic tables, grill, bike rack; not fenced; no signs restricting use	No; not publicly owned
26	Craycroft Road (AZ B:13:693 [ASM])	Segment intersects with East Rex Stray; in study area	Pima County DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
27	Billy Lane Lauffer Middle School	5385 E. Littletown Road; in study area	Sunnyside Unified School District 12	Softball/baseball diamond, basketball courts, soccer fields, volleyball, ramada; fenced	Potential
28	Craycroft Elementary School	5455 E. Littletown Road; in study area	Sunnyside Unified School District 12	Basketball court, sand pit, ramadas, open fields, playground; fenced	Potential

Table C-2. Possible Section 4(f) resources in the SR 210, Golf Links Road to Eastern Termini study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
29	Thomas Jay Regional Park	6465 S. Craycroft Road; in study area	Pima County Natural Resources, Parks and Recreation	Baseball/softball fields (lighted), senior baseball field, t-ball field, batting cages, basketball courts (lighted), drinking water, picnic tables, playgrounds, ramadas, grills, restrooms, concessions, parking, Littletown Community Center	Yes
30	Corazon del Pueblo Common Area A	East Calle de la Apertura; in study area	Habitat for Humanity Tucson, Inc.	Playground, shade ramada, picnic table, trash can; not fenced; no signs restricting use	No; not publicly owned
31	Corazon del Pueblo Common Area A	South Camino de la Humanidad and East Elvira Road; in study area	Habitat for Humanity Tucson, Inc.	Playground; not fenced; no signs restricting use	No; not publicly owned
32	Corazon del Pueblo Common Area A	East Camino del Agua; in study area	Habitat for Humanity Tucson, Inc.	Playground; not fenced; no signs restricting use	No; not publicly owned
33	Canterbury Ranch Common Area A	South Parsons Tale Drive; in study area	Canterbury Ranch HOA	Playground; not fenced; no signs restricting use	No; not publicly owned
34	Canterbury Ranch Common Area B	South Millers Tale Drive; in study area	Canterbury Ranch HOA	Playground; not fenced; no signs restricting use	No; not publicly owned
35	Window Rock East Recreation and Open Space	South 2nd Mesa Drive; in study area	Window Rock East HOA	Pool, playground, basketball court, clubhouse; recreation area is fenced; community is gated	No; not publicly owned
36	Wilmot Road (AZ B:13:661 [ASM])	Segment south of I-10; in study area	City of Tucson DOT	Historic roadway; recommended eligible for the NRHP under Criterion A	Yes
37	Wilmot Road Trailhead for the Julian Wash Greenway	South Wilmot Road north of I-10; in the study area	PCPR; TPR; UA	Planned, undeveloped	Potential
38	Robert A. Price, Sr. Park	South Wilmot Road and East Via Rio Pico; in study area	TPR	Planned, undeveloped	Potential

Table C-2. Possible Section 4(f) resources in the SR 210, Golf Links Road to Eastern Termini study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
39	La Estancia de Tucson Linear Park	Between South Wilmot and South Kolb roads north of I-10; in study area	TPR	Walking path parallel to Julian Wash	Yes
40	Wilmot Road Greenway	From Julian Wash Greenway to Sahuarita Road east of the Wilmot Road alignment; traverses study area	TPR	Planned, undeveloped	Potential
41	Gas Line Trail	From Wilmot Road to the Pima-Cochise county boundary north of and parallel to I-10; traverses study area	TPR	Planned, undeveloped	Potential
42	Desert Stone Common Area B (recreation area)	South Wilmot Road between East Garden Stone and East Sentinal Stone drives; in study area	Desert Stone HOA	Ramadas, picnicking, grills, trash cans, basketball court, playground, multi-use fields; not fenced; no signs restricting use	No; not publicly owned
43	Vista Montana Estates Common Area B (recreation center)	East Stadium Parkway; in study area	Vista Montana Estates HOA	Pool, community center, basketball court, volleyball court, picnic, playground; recreation area for residents only; community is gated	No; not publicly owned
44	Airport Wash North Fork Trail	From Alvernon Way to Sarnoff Drive; traverses study area	TPR	Planned, undeveloped	Potential
45	Kolb Road Path	From Valencia Road to Julian Wash Greenway; in study area	TPR	Planned, undeveloped	Potential
46	Kolb Road Trailhead for the Julian Wash Greenway	Kolb Road north of I-10; in study area	PCPR; TPR; UA	Planned, undeveloped	Potential
47	Kolb South Greenway	From Julian Wash Greenway to 1 mile south of Old Vail Road; traverses study area	TPR	Planned, undeveloped	Potential
48	Julian Basin Trails Park	Kolb Road north of I-10; in study area	PCPR	Planned for the existing retention basin east of Kolb Road; undeveloped	Potential

Table C-2. Possible Section 4(f) resources in the SR 210, Golf Links Road to Eastern Termini study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
49	Trails West Mobile Home Park	8401 S. Kolb Road; in study area	Trails Associates, LLC	Pools, community center, park, pond; no public access	No; not publicly owned
50	Voyager RV Resort	8701 S. Kolb Road; in study area	Voyager RV Resort, LLC	Golf course, tennis courts, softball/ baseball diamond; golf course open to the public; privately owned	No; not publicly owned
51	Rita Ranch Flood Control Basin Trails Park	North of the Union Pacific Railroad (UPRR) line between South Pantano Road and East Old Vail Road; in 0.25-mile buffer around study area	PCPR	Planned, undeveloped	Potential
52	Rita Ranch/Julian Wash Greenway Connector Trail	From the Rita Ranch Flood Control Basin Trails Park to East Rita Road; in 0.25-mile buffer around study area	PCPR	Planned, undeveloped; design complete	Potential
53	Sarnoff Road Alignment Greenway	From Julian Wash Greenway to Sahuarita Road east of the Sarnoff Road alignment; traverses study area	TPR	Planned, undeveloped	Potential
54	Vail Academy and High School	7762 E. Science Park Drive; in study area	Vail School District	Basketball court, fabric ramadas, playgrounds, water fountains, open ball fields, fenced	Potential
55	UA Tech Park Recreation Center	9070 S. Rita Road; in the study area	UA	Basketball court, tennis courts, softball/baseball diamonds, open playing fields, ramadas, walking path, recreation center; fenced; it is a private recreational facility for employees and families of the Tech Park; site not open to the public	No; not open to the public
56	El Paso & Southwestern Railroad's Rita Station (AZ B:13:555 [ASM])	South of the existing UPRR line, approximately 0.5 mile southeast of South Rita Road; in study area	Privately owned.	Historic structural remnants and a trash dump from the Rita Railroad Station; recommended eligible for the NRHP under Criteria A, C, and D	Yes

Table C-2. Possible Section 4(f) resources in the SR 210, Golf Links Road to Eastern Termini study area

	Resource	Location/ Proximity	Jurisdiction or Owner	Features	Recommended Status
57	Old Vail/Harrison Road Greenway	From the Old Vail Road/UPRR intersection to Franco Wash via Harrison Road; traverses study area	TPR	Planned, undeveloped	Potential
58	Rita Ranch Greenway	From the Julia Wash Greenway to Houghton Road north of the Rita Road alignment; traverses the 0.25-mile buffer around study area	TPR	Partially developed; planned; portion in the study area not yet developed	Potential

APPENDIX D

Census Data

Table D-1. Racial and ethnic demographics

Area	Total Population	White		African American		Native American		Asian		Pacific Islander		Other Race		Two or More Races		Hispanic[a]	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
CT (20)	6,988	4,549	65.1	279	4.0	212	3.0	107	1.5	15	0.2	1,529	21.9	297	4.3	4,517	64.6
CT (21)	6,455	3,151	48.8	599	9.3	261	4.0	112	1.7	4	0.1	1,942	30.1	386	6.0	4,880	75.6
CT (22.01)	3,508	1,917	54.6	126	3.6	136	3.9	46	1.3	2	0.1	1,114	31.8	167	4.8	2,897	82.6
CT (22.02)	3,728	1,814	48.7	431	11.6	132	3.5	57	1.5	6	0.2	1,147	30.8	141	3.8	2,696	72.3
CT (23)	5,647	2,559	45.3	171	3.0	605	10.7	44	0.8	6	0.1	2,039	36.1	223	3.9	4,430	78.4
CT (24)	5,980	3,297	55.1	135	2.3	369	6.2	17	0.3	7	0.1	1,979	33.1	176	2.9	5,256	87.9
CT (25.01)	6,213	3,726	60.0	277	4.5	363	5.8	58	0.9	4	0.1	1,573	25.3	212	3.4	4,496	72.4
CT (36)	4,552	3,117	68.5	523	11.5	67	1.5	125	2.7	29	0.6	326	7.2	365	8.0	1,074	23.6
CT (40.61)	4,821	4,230	87.7	101	2.1	41	0.9	86	1.8	0	0.0	204	4.2	159	3.3	663	13.8
CT (40.62)	5,398	4,309	79.8	242	4.5	27	0.5	224	4.1	9	0.2	329	6.1	258	4.8	1,398	25.9
CT (40.73)	4,795	3,857	80.4	295	6.2	36	0.8	148	3.1	23	0.5	232	4.8	204	4.3	981	20.5
CT (40.74)	2,039	1,686	82.7	66	3.2	21	1.0	51	2.5	7	0.3	97	4.8	111	5.4	456	22.4
CT (41.09)	5,304	4,666	88.0	57	1.1	74	1.4	47	0.9	5	0.1	294	5.5	161	3.0	1,023	19.3
CT (41.12)	2,892	1,709	59.1	111	3.8	67	2.3	24	0.8	0	0.0	873	30.2	108	3.7	2,008	69.4
CT (41.15)	7,312	4,120	56.3	173	2.4	171	2.3	90	1.2	12	0.2	2,482	33.9	264	3.6	5,565	76.1
CT (41.16)	2,437	1,475	60.5	119	4.9	37	1.5	30	1.2	3	0.1	690	28.3	83	3.4	1,668	68.4
CT (41.17)	5,792	3,030	52.3	286	4.9	192	3.3	77	1.3	6	0.1	1,964	33.9	237	4.1	4,327	74.7
CT (41.22)	3,802	1,851	48.7	234	6.2	221	5.8	60	1.6	14	0.4	1,291	34.0	131	3.4	2,858	75.2
CT (4105.01)	4,668	3,031	64.9	343	7.3	101	2.2	178	3.8	11	0.2	777	16.6	227	4.9	2,056	44.0
CT (4105.02)	6,243	3,725	59.7	692	11.1	150	2.4	274	4.4	30	0.5	1,071	17.2	301	4.8	2,766	44.3
CT (4105.03)	5,516	4,409	79.9	269	4.9	77	1.4	154	2.8	24	0.4	341	6.2	242	4.4	1,417	25.7
Tucson, Arizona	843,168	619,229	73.4	32,221	3.8	23,197	2.8	23,871	2.8	1,478	0.2	111,249	13.2	31,923	3.8	307,881	36.5
Pima County	980,263	728,751	74.3	34,674	3.5	32,605	3.3	25,731	2.6	1,624	0.2	120,639	12.3	36,239	3.7	338,802	34.6

Source: U.S. Census Bureau, Census 2010
CT = Census Tract, # = Number, % = Percentage
[a] "Hispanic" refers to ethnicity and is derived from the total population, not as a separate race; i.e., it is calculated differently from the other columns in this table

Table D-2. Total minority, ages 60 and older, below poverty level, and female head of household

Area	Total Population	Total Minority[a]		Ages 60 and Older		Population for whom Disabled Is Determined	Disabled		Population for whom Poverty Is Determined	Below Poverty Level		Households	Female Head of Household	
		#	%	#	%		#	%		#	%		#	%
CT (20)	7,096	1,839	25.9	1,228	17.3	7,096	1,064	15.0	7,096	1,584	22.3	2,648	217	8.2
CT (21)	5,834	1,874	32.1	764	13.1	5,780	762	13.2	5,780	1,813	31.4	1,827	123	6.7
CT (22.01)	3,590	1,449	40.4	578	16.1	3,576	397	11.1	3,469	741	21.4	1,112	105	9.4
CT (22.02)	3,834	1,707	44.5	383	10.0	3,820	395	10.3	3,834	1,506	39.3	1,080	201	18.6
CT (23)	5,606	1,603	28.6	740	13.2	5,599	1,012	18.1	5,561	2,930	52.7	1,830	292	16.0
CT (24)	5,853	2,069	35.3	1,007	17.2	5,853	925	15.8	5,736	2,104	36.7	1,854	226	12.2
CT (25.01)	6,655	1,635	24.6	972	14.6	4,300	749	17.4	4,290	1,080	25.2	1,441	122	8.5
CT (36)	5,297	1,276	24.1	69	1.3	3,671	178	4.8	4,230	481	11.4	1,217	158	13.0
CT (40.61	4,456	705	15.8	802	18.0	4,425	428	9.7	4,377	164	3.7	1,641	14	0.9
CT (40.62)	4,751	992	20.9	485	10.2	4,619	369	8.0	4,718	169	3.6	1,716	108	6.3
CT (40.73)	5,336	656	12.3	411	7.7	5,264	661	12.6	5,322	261	4.9	1,597	146	9.1
CT (40.74)	1,674	139	8.3	84	5.0	1,635	72	4.4	1,674	165	9.9	631	88	13.9
CT (41.09)	4,970	371	7.5	1,178	23.7	4,957	487	9.8	4,958	427	8.6	1,870	45	2.4
CT (41.12)	3,023	1,126	37.2	420	13.9	3,023	488	16.1	3,023	571	18.9	904	79	8.7
CT (41.15)	7,024	2,851	40.6	773	11.0	6,986	935	13.4	7,024	4,031	57.4	2,077	241	11.6
CT (41.16)	2,324	1,152	49.6	202	8.7	2,305	249	10.8	2,324	761	32.7	801	36	4.5
CT (41.17)	6,010	2,348	39.1	463	7.7	5,985	661	11.0	5,980	1,297	21.7	1,835	313	17.1
CT (41.18)	4,387	877	20.0	518	11.8	4,274	484	11.3	4,311	516	12.0	1,436	169	11.8
CT (41.21)	6,729	2,159	32.1	384	5.7	5,278	335	6.3	5,384	499	9.3	1,756	169	9.6
CT (41.22)	4,096	1,537	37.5	176	4.3	4,076	317	7.8	4,096	847	20.7	1,083	197	18.2
CT (41.25)	5,459	1,163	21.3	1,801	33.0	4,639	641	13.8	4,767	194	4.1	2,097	19	0.9
Tucson, Arizona	849,157	178,367	21.0	174,077	20.5	833,468	109,509	13.1	826,368	163,344	19.8	331,624	24,676	7.4
Pima County	981,048	202,790	20.7	212,887	21.7	962,885	126,957	13.2	955,948	177,025	18.5	382,814	26,617	7.0

Source: U.S. Census Bureau, 2008–2012 American Community Survey 5-Year Estimate

2012 Census Tract numbering system changed subsequent to 2010 numbering; therefore, all numbers do not match Table D-1

CT = Census Tract, # = Number, % = Percentage

Shaded areas denote populations that are meaningfully higher than the comparison populations

[a] "Total Minority" is composed of all people who consider themselves Non-White racially plus those who consider themselves White Hispanic