

Interstate 10 Ina Road Traffic Interchange (TI) to Ruthrauff Road TI Draft Environmental Assessment

Pima County, Arizona
Federal Aid No. 010-D(211)N
ADOT Project No. 010 PM 247 H7583 01L



May 2012
Version 5.0



Arizona Department of Transportation
Intermodal Transportation Division
Environmental Planning Group
205 S. 17th Avenue
Phoenix, AZ 85007

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Draft Environmental Assessment
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Approved by: Thor Anderson Date: 5/23/12

Thor Anderson, Manager
Environmental Planning Group
Arizona Department of Transportation

Approved by: Kenneth H. Davis Date: May 23, 2012

for Karla S. Petty, Division Administrator
Federal Highway Administration
U.S. Department of Transportation

This draft environmental assessment has been prepared in accordance with provisions and requirements of Title 23 Code of Federal Regulations Part 771, relating to the implementation of the National Environmental Policy Act of 1969.

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Abbreviations and Acronyms

ACC	Arizona Corporation Commission
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
APE	area of potential effects
ASM	Arizona State Museum
ASTM	American Society for Testing and Materials
AZPDES	Arizona Pollutant Discharge Elimination System
bgs	below ground surface
BMPs	best management practices
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CGP	Construction General Permit
CMMP	Contaminated Media Management Plan
CO	carbon monoxide
Corps	U.S. Army Corps of Engineers
CPC	California Portland Cement
CWA	Clean Water Act of 1970
dBA	A-weighted decibel
DDI	diverging diamond interchange
EA	environmental assessment
ECM	environmental construction monitoring
EPA	U.S. Environmental Protection Agency
ESA	environmental site assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
HCT	high-capacity transit
I-10	Interstate 10
LOS	level of service
m ³	cubic meter
µg	microgram
MP	milepost

MSATs	mobile source air toxics
MS4	municipal separate storm sewer system
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NAP	Noise Abatement Policy
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NRHP	National Register of Historic Places
NO ₂	nitrogen dioxide
O ₃	ozone
PA	Programmatic Agreement
PAG	Pima Association of Governments
PCRWRD	Pima County Regional Wastewater Reclamation Department
PM _{2.5}	fine particulate matter (greater than 2.5 microns)
PM ₁₀	particulate matter (greater than 10 microns)
ppm	parts per million
PSI	preliminary site investigation
ROMP	Regional Optimization Master Plan
ROW	right-of-way
RTA	Regional Transportation Authority
RTP	<i>Regional Transportation Plan</i>
SHPO	State Historic Preservation Officer
SO ₂	sulfur dioxide
SPUI	single point urban interchange
SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
TDI	tight diamond interchange
TI	traffic interchange
TIP	Transportation Improvement Program
UPRR	Union Pacific Railroad
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
VMT	vehicle miles traveled
Waters	waters of the United States
WQARF	Water Quality Assurance Revolving Fund

Mitigation Measures

Arizona Department of Transportation Design Responsibilities

1. Acquisition would be conducted through an assistance program in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 Code of Federal Regulations § 24), which identifies the process, procedures, and time frame for right-of-way acquisition and relocation of affected residents or businesses (see pages 33 and 41).
2. To ensure sufficient access to properties during construction, key local access improvements at Ina Road and Ruthrauff Road would be completed prior to reconstruction of the respective traffic interchanges (see page 41).
3. Landscape plans would include areas of available right-of-way along North Camino de la Cruz and Maryvale Avenue to provide a buffer between residential and commercial land uses (see page 42).
4. A transportation management plan would be prepared consistent with the *Manual on Uniform Traffic Control Devices for Streets and Highways* (Federal Highway Administration 2010). In addition, the transportation management plan would have the following requirements (see page 42):
 - During development of the final design, the Arizona Department of Transportation would coordinate with emergency response and transit providers (Arizona Department of Public Safety, City of Tucson Police Department, Town of Marana Police Department, Pima County Sheriff's Department, Northwest Fire District, Rural/Metro Fire Department, Northwest Medical Center, SunTran, and the Amphitheater, Marana Unified, Flowing Wells, and Tucson Unified school districts) to accommodate emergency and transit needs in the transportation management plan.
 - The plan would account for peak traffic associated with seasonal events (golf tournaments, gem and mineral show, cycling events, etc.).
 - The plan would ensure access to all properties would be provided and maintained during construction.
 - Signs would indicate business access to commercial properties within the construction zone.
5. During final design, testing and data recovery plans would be developed and implemented by the Arizona Department of Transportation Environmental Planning Group Historic Preservation Team, in consultation with the State Historic Preservation Office and other consulting parties. The testing and data recovery plan would be developed in accordance with the existing Programmatic Agreement executed for the project. Construction activities would not occur in areas requiring testing and data recovery until the terms and conditions of the Programmatic Agreement have been fulfilled (see page 52).
6. During final design, the Arizona Department of Transportation would coordinate with Pima County to replace lost parking on-site at Mike Jacobs Sports Park, reconstruct the driveway entrance to the parking lot, and replace the affected landscaping (see page 57).
7. Prior to completion of final design, a project-level PM₁₀ analysis would be conducted to confirm project conformity with the Rillito PM₁₀ nonattainment area (see page 62).
8. During final design, the Arizona Department of Transportation project manager would arrange for qualified personnel to review and update the noise analysis (see page 67).

9. During final design, the Arizona Department of Transportation would coordinate relocation of utilities with the affected utility companies. If service disruption would be needed for relocation, the Arizona Department of Transportation would coordinate with the utility companies to ensure customers are notified prior to service disruption (see page 69).
10. The Arizona Department of Transportation would provide Union Pacific Railroad with an opportunity to review and comment on the design plans (see page 69).
11. The Arizona Department of Transportation would incorporate architectural and landscape treatments into the final design of structures, including retaining walls. Treatment designs would be evaluated and developed with consideration of community input (see page 72).
12. The Arizona Department of Transportation would prepare and submit an application to the U.S. Army Corps of Engineers for a Clean Water Act Section 404 permit for the project. No work would occur within waters of the United States until the appropriate Clean Water Act Section 401 certification and Section 404 permit are obtained (see page 78).
13. The Arizona Department of Transportation would design drainage so that all runoff from the completed bridges would be captured and routed to a catch basin for settling prior to discharge, consistent with the Arizona Department of Transportation's *Erosion and Pollution Control Manual for Highway Design and Construction* and *Post-Construction Best Management Practices Manual for Highway Design and Construction* (see page 78).
14. The Arizona Department of Transportation would provide the Pima County (520-243-1800), Town of Marana (520-382-2600), and City of Tucson (520-837-6692) Floodplain Managers with an opportunity to review and comment on the design plans (see page 83).
15. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity (see page 85).
16. Site-specific environmental site assessments would be conducted prior to property acquisition for the properties as recommended in the 2009 Phase I Initial Site Assessment (see page 91).
17. Preliminary site investigations would be conducted for locations where construction activities would occur within 100 feet of relevant facilities and where such activities would involve ground disturbance at depths of 18 inches or greater. The preliminary site investigation would include a drilling and sampling program to verify or refute the existence of actionable concentrations of released hazardous materials. The analytical program would be targeted to determine the concentration of residual impacts for facilities recommended in the 2011 Phase I Initial Site Assessment (see page 91).
18. During final design, the Arizona Department of Transportation Project Manager would coordinate with the Arizona Department of Transportation Environmental Planning Group Hazardous Materials Coordinator (602-712-7767) to complete testing for asbestos and lead-based paint within the project limits and, if necessary, recommend remediation measures (see page 91).
19. The Arizona Department of Transportation Project Manager would contact the Arizona Department of Transportation Hazardous Materials Coordinator (602-712-7767) 30 days prior to bid advertisement to determine the need for additional site assessment (see page 91).

Arizona Department of Transportation District Responsibilities

1. To ensure sufficient access to properties during construction, key local access improvements at Ina Road and Ruthrauff Road would be completed prior to reconstruction of the respective traffic interchanges (see page 42).
2. The Engineer would contact the Arizona Department of Transportation Environmental Planning Group Historic Preservation Team (602-712-7767) to schedule the preconstruction or partnering meeting on a mutually agreeable date to ensure a qualified Team representative would be available to attend the meeting (see page 53).
3. Prior to construction, the Engineer would have the contractor review the attached “Environmental Protection on Arizona Department of Transportation Projects Instructions to Contractors” and review and sign the attached “Checklist for Environmental Compliance.” The Engineer would also sign the checklist and submit it to the Arizona Department of Transportation Environmental Planning Group 7 calendar days prior to construction (see page 78).
4. No work would occur within waters of the United States until the appropriate Clean Water Act Section 401 certification and Section 404 permit are obtained (see page 78).
5. The Arizona Department of Transportation would ensure that a Stormwater Pollution Prevention Plan meeting the requirements of the current Arizona Pollutant Discharge Elimination System General Permit for Discharge from Construction Activities to Waters of the United States issued by the Arizona Department of Environmental Quality is prepared and approved for the project (see page 78).
6. The Engineer would submit the contractors’ Arizona Pollutant Discharge Elimination System Notice of Intent and Notice of Termination to the Environmental Coordinator (see page 78).
7. The District would review and approve the Section 404 permit and Section 401 certification applications prior to submittal (see page 78).
8. The Arizona Department of Transportation would inform contractors of the potential contamination associated with hazardous materials sites (see page 91).
9. The Engineer would review the National Emissions Standards for Hazardous Air Pollutants notification received from the contractor. The contractor would not start work associated with any structures until 10 working days have passed since submittal of the notification to regulatory agencies (see page 91).

Arizona Department of Transportation Roadside Development Section Responsibilities

1. Protected native plants within the project limits would be affected by this project; therefore, the Arizona Department of Transportation Roadside Development Section would determine if Arizona Department of Agriculture notification is needed. If notification is needed, the Arizona Department of Transportation Roadside Development Section would notify the Arizona Department of Agriculture by a “Notice of Intent to Clear Land” at least 60 days prior to the start of construction (see page 85).

Contractor Responsibilities

1. To ensure sufficient access to properties during construction, key local access improvements at Ina Road and Ruthrauff Road would be completed prior to reconstruction of the respective traffic interchanges (see page 42).

2. The contractor, after coordination with the Engineer, would communicate traffic control measures with the public, local officials, and the media prior to and during construction activities. Communication may include, but is not limited to, media alerts, direct mailings to area businesses and property owners, information on freeway variable message signs, and paid newspaper notices (see page 42).
3. The contractor, after coordination with the Engineer, would provide a construction notice to residents and businesses in the general project area at least 2 weeks prior to construction (see page 42).
4. The contractor, after coordination with the Engineer, would notify the public and business owners of temporary access changes during construction at least 7 calendar days in advance of the change (see page 42).
5. The contractor would contact local emergency services (hospital, fire, and police, including Arizona Department of Public Safety, City of Tucson Police Department, Town of Marana Police Department, Pima County Sheriff's Department, Northwest Fire District, Rural/Metro Fire Department, and Northwest Medical Center) at least 14 calendar days in advance of crossroad, traffic interchange, or frontage road closures so that they could arrange for alternate travel routes (see page 42).
6. The contractor would contact municipal transit providers (public transit and school districts, including SunTran and Amphitheater, Marana Unified, Flowing Wells, and Tucson Unified school districts) at least 14 calendar days in advance of crossroad, traffic interchange, or frontage road closures so that they could notify their riders and arrange for alternate travel routes (see page 42).
7. At least 14 calendar days prior to construction, the contractor would place advance-warning signs at locations designated by the Engineer to notify motorists, pedestrians, and bicyclists of construction-related delays (see page 43).
8. With the exception of temporary, short-term closures of less than 3 hours of driveways, the contractor would maintain driveway access to all businesses and residences throughout construction. If a given property has multiple driveways, at least one would remain open at all times (see page 43).
9. Access to adjacent businesses and residences would be maintained throughout construction (see page 43).
10. The contractor, after coordination with the Engineer, would notify the public a minimum of 48 hours in advance of any road closures (see page 43).
11. The contractor would provide for the adequate protection of all vehicular and pedestrian traffic and workers through any portion of the work where construction operations interfere with, obstruct, or create a hazard to the movement of traffic consistent with the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 701, Maintenance and Protection of Traffic, dated 2008 (see page 43).
12. If previously unidentified cultural resources are encountered during the proposed undertaking, the contractor shall stop work immediately at that location and shall take all reasonable steps to secure the preservation of those resources. The contractor would call the Arizona Department of Transportation Environmental Planning Group Historic Preservation Team at (602) 712-7767 immediately to make arrangements for the proper treatment of those resources (see page 53).

13. The contractor would not work in any area with previously identified historic properties (archaeological sites, old State Route 84, the railroad) or in any non-site-specific areas where archaeological testing is required until authorized by the Arizona Department of Transportation Environmental Planning Group Historic Preservation Team (see page 53).
14. The contractor would maintain access to Mike Jacob Sports Park during construction (see page 57).
15. The contractor would maintain trail access during construction. Advance notice would be posted for trail users if any temporary trail closures were required (see page 57).
16. Any trail features negatively affected during construction would be returned to preconstruction conditions (see page 57).
17. The contractor would control, reduce, remove, or prevent air pollution in all its forms, including air contaminants, in the performance of the contractor's work (see page 62).
18. The contractor would comply with the applicable requirements of Arizona Revised Statutes Section 49-401 et seq. (Air Quality) and with the Arizona Administrative Code, Title 18, Chapter 2 (Air Pollution Control) (see page 62).
19. Consistent with the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 104.08 (2008), the following standard specifications would apply (see page 67):
 - o The contractor would comply with all local sound control and noise level rules, regulations, and ordinances that apply to any work performed pursuant to the contract.
 - o Each internal combustion engine used for any purpose on the work or related to the work would be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine would be operated on the work without its muffler being in good working condition.
20. In conjunction with the utility provider, the contractor would notify members of the public and business owners of temporary utility service interruptions during construction at least 7 calendar days in advance of the interruption of service (see page 69).
21. The contractor would establish emergency response procedures in the case of accidental utility disruptions (see page 69).
22. Prior to construction, the contractor would review the attached "Environmental Protection on Arizona Department of Transportation Projects Instructions to Contractors" and review and sign the attached "Checklist for Environmental Compliance." The Engineer would also sign the checklist and submit it to the Arizona Department of Transportation Environmental Planning Group 7 calendar days prior to construction (see page 78).
23. No work would occur within waters of the United States until the appropriate Clean Water Act Section 404 permit and Section 401 certification are obtained (see page 79).
24. The contractor would comply with all terms and conditions of the Clean Water Act Section 401(a) Water Quality Certification certified by the Arizona Department of Environmental Quality (see page 79).
25. The contractor would comply with all terms, general conditions, and special conditions of the Clean Water Act Section 404 permit as established by the U.S. Army Corps of Engineers (see page 79).

26. The contractor would develop a containment plan for debris and construction materials to avoid contamination of the Cañada del Oro Wash and Rillito Creek. The containment plan would be approved by the Arizona Department of Transportation Engineer prior to construction (see page 79).
27. The contractor would use the Arizona Department of Transportation's project erosion and sediment control plans, details, and specifications as a guide in developing a project Stormwater Pollution Prevention Plan. Best management practices set forth in the project erosion and sediment control plans, details, and specifications would be included in the contractor's Stormwater Pollution Prevention Plan (see page 79).
28. The contractor, in association with the District, would submit the Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality only after the District has reviewed and approved the Stormwater Pollution Prevention Plan (see page 79).
29. The project is located within a designated municipal separate storm sewer system. Therefore, the contractor, in association with the District, would send a copy of the certificate authorizing permit coverage and a copy of the Notice of Termination acknowledgement letter to the Arizona Department of Transportation Office of Environmental Services Water Quality Group, Pima County, City of Tucson, and Town of Marana as appropriate based on the location of project activities (see page 79).
30. Best management practices would be used during construction to protect water resources. These include (see page 79):
 - Lubricants, fuels, and oils would be stored and dispensed away from the washes.
 - Any disturbance to the washes would be minimized and, once the piers are in place, the remainder of the work would occur outside the washes.
 - Gravel and riprap would be obtained from approved sources.
 - Catchment silt fencing, fiber rolls, or concrete barriers would be used to prevent debris, waste, and toxic compounds from entering the washes.
 - Construction equipment would be inspected daily for leaks or fluid discharges.
 - All maintenance yards would be located outside the washes.
 - All construction equipment maintenance and storage would occur outside of the washes.
 - No concrete dumping or equipment cleaning would occur in or near the washes.
 - Soils that are removed from the earthen bottom portions of washes would be labeled and stockpiled outside the channel until construction activities are completed. Then the soils removed from the wash would be placed back into the areas from where they were removed.
 - Any upland soils that are removed would be moved farther upland to prevent erosion into the washes.
 - Any discharges would be handled in accordance with state and federal regulations.
31. To prevent the introduction of invasive species, all earthmoving and hauling equipment would be washed at the contractor's storage facility prior to entering the construction site (see page 85).

32. To prevent invasive species seeds from leaving the site, the contractor would inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site (see page 85).
33. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity (see page 85).
34. The contractor would employ a qualified biologist to complete a preconstruction survey for burrowing owls 96 hours prior to construction in all suitable habitat that would be disturbed. The biologist would possess a burrowing owl survey protocol training certificate issued by the Arizona Game and Fish Department. Upon completion of the surveys, the contractor would contact the Arizona Department of Transportation Environmental Planning Group (602-712-7767) to provide the survey results (see page 87).
35. If any burrowing owls are located during preconstruction surveys or construction, the contractor would employ a qualified biologist holding a permit from the U.S. Fish and Wildlife Service to relocate burrowing owls from the project area, as appropriate (see page 87).
36. If burrowing owls or active burrows are identified during the preconstruction surveys or during construction, no construction activities would take place within 100 feet of any active burrow until the owls are relocated (see page 87).
37. The contractor would not cause injury or death to swallows (including eggs and nestlings) and would avoid work within 200 feet of nesting swallows from February 1 to August 30 of any calendar year. If work would occur within 200 feet of nesting cliff swallows between February 1 and August 30, the contractor would adhere to the following (see page 87):
 - The contractor would completely remove all existing swallow nests within 200 feet of work areas after August 30 but prior to February 1 to prevent cliff swallows from reusing those nests.
 - The contractor would implement exclusionary measures to prevent swallows from building new nests within 200 feet of work areas. Exclusionary measures would be implemented in all areas where swallows are likely to nest, and may include: (a) continually removing nesting materials during early nest construction when eggs or nestlings are not present, (b) installing exclusionary netting (wire or plastic mesh 0.75 inch or less in diameter), (c) installing deterrent spike strips, and/or (d) applying an appropriate bird exclusion liquid or gel.
 - The contractor would not disturb any active swallow nests (completed or partially completed nests that contain eggs or nestlings). If any active nest is discovered within 200 feet of construction activities, work shall stop and the Arizona Department of Transportation Biologist would be contacted (602-712-7767) to evaluate the potential for disturbance of nests.
 - The contractor would monitor and maintain the effectiveness of exclusionary measures used. Netting would be maintained such that it remains in place without any loose areas or openings that could trap and/or entangle birds. Spike strips would be maintained such that they remain in place. Exclusion liquid or gel would be reapplied as often as necessary to remain effective.
 - The contractor would remove all exclusionary measures after project completion to the satisfaction of the Engineer.

38. The contractor would immediately stop all subsurface activities and contact the Engineer in the event that potentially hazardous materials or hydrocarbons are encountered, an odor is identified, or significantly stained soil is visible during construction. The contractor would follow all applicable regulations regarding discovery and response for hazardous materials encountered during the construction process (see page 91).
39. The contractor would prepare a Contaminated Media Management Plan for work conducted within 200 feet of the current El Camino del Cerro groundwater plume (based on the latest available Arizona Department of Environmental Quality maps). The plan would address requirements for worker and environmental exposure, monitoring, sampling, storage, and disposal, as applicable. The plan would be submitted to the Arizona Department of Transportation Environmental Planning Group Hazardous Materials Coordinator (602-712-7767) for approval (see page 91).
40. Environmental construction monitoring for geotechnical boring within 200 feet of the current El Camino del Cerro groundwater plume (based on the latest available Arizona Department of Environmental Quality maps at time of work) would be conducted consistent with the approved Contaminated Media Management Plan prepared for project construction (see page 91).
41. The contractor would complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with any structures and submit it to the Engineer for review. After Engineer approval, the notification would be submitted to the Arizona Department of Transportation Hazardous Materials Coordinator (602-712-7767) for a 5 working day review and approval. Upon approval by the Hazardous Materials Coordinator, the contractor would file the notification with the Arizona Department of Environmental Quality and the Pima County Department of Environmental Quality at least 10 working days prior to demolition/renovation associated with any structures (see page 92).
42. The contractor would not start work associated with the demolition/renovation of structures until 10 working days have passed since the submittal of the National Emissions Standards for Hazardous Air Pollutants notification to the regulatory agencies (see page 92).
43. During construction operations, should material be encountered that the contractor believes to be hazardous or contaminated, the contractor would immediately stop work and remove workers within the contaminated areas, barricade the area, provide traffic controls, and notify the ADOT Engineer in accordance with the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 107.07, Sanitary Health, and Safety Provisions, dated 2008 (see page 93).
44. Materials required for this project from sources outside of the project area would be examined for environmental effects by the contractor prior to use through a separate environmental analysis in accordance with the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 1001, Material Sources, dated 2008. Additionally, excess waste material and construction debris would be disposed of at sites supplied by the contractor in accordance with those standard specifications (Arizona Department of Transportation 2008) (see page 93).
45. Materials would be disposed of consistent with the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 107, Legal Relations and Responsibility to Public, dated 2008. Materials removed during construction operations such as trees, stumps, building materials, irrigation and drainage structures, broken concrete, and other similar materials would not be dumped on either private or public property unless the contractor has obtained written permission from the owner or public agency with jurisdiction over the land. Written permission would not be required, however, when materials are disposed of at an operating public dumping ground (see page 93).

I. Introduction

A. Explanation of an Environmental Assessment

This environmental assessment (EA) for the proposed Interstate 10 (I-10), Ina Road Traffic Interchange (TI) to Ruthrauff Road TI improvement project, was prepared in accordance with the National Environmental Policy Act of 1969, with the Federal Highway Administration (FHWA) acting as the lead federal agency. The Arizona Department of Transportation (ADOT) participated in conjunction with FHWA as a joint lead agency in the planning, preparation, and review of all technical and environmental documents.

According to Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [C.F.R.] § 1508.9), an EA describes the need for the proposed action, alternatives for implementing or constructing the proposed action, and the environmental impacts of the proposed action and alternatives. It also provides a list of agencies and persons consulted during evaluation of the proposed action. This document serves as a tool for FHWA and ADOT to identify potentially significant impacts to social, economic, and environmental resources and measures that can mitigate such impacts.

B. Location

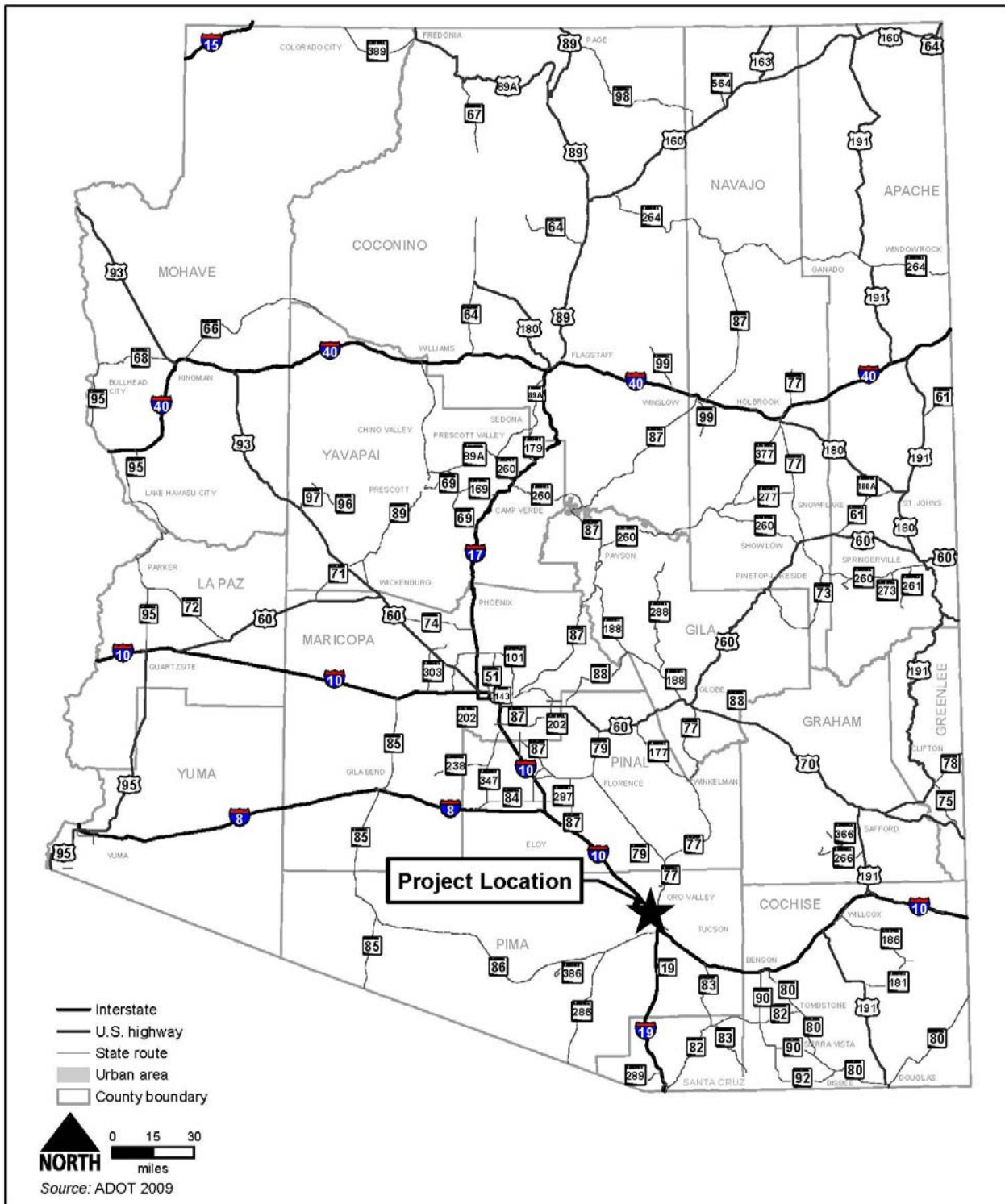
The study area for the proposed action is located in the Tucson metropolitan area of Pima County, Arizona, and is within the jurisdictions of the Town of Marana, City of Tucson, and Pima County (see Figures 1 and 2). The project limits extend from milepost (MP) 247.5 to MP 253.43 on I-10, including the I-10 frontage roads and the TIs at Ina, Orange Grove, Sunset, and Ruthrauff Roads. The study area considered in this evaluation is identified in Figure 2.

C. Project Background and Overview

ADOT, in conjunction with FHWA, has identified the need to improve I-10 from Ina Road to Ruthrauff Road. Within the study area, I-10 is classified as an urban principal arterial in the State Highway System Log, and it functions as an access-controlled interstate featuring three through lanes in each direction, an undeveloped median, two-lane one-way frontage roads in each direction, and TIs at Ina, Orange Grove, Sunset, and Ruthrauff Roads. While designated as an east–west interstate, in the study area, I-10 is oriented northwest to southeast.

I-10 provides mobility for communities along its route and is a primary carrier of commerce and interstate travel across the United States (ADOT 2010a). This segment of I-10 is also part of the CANAMEX Corridor, facilitating trade with Mexico, which has a port of entry approximately 71 miles to the south by way of Interstate 19. The CANAMEX Corridor was defined by Congress in the 1995 National Highway Systems Designation Act (Public Law 104-59). It is a strategic investment in infrastructure and technology to increase competitiveness in global trade, create jobs, and maximize economic potential. The transportation component includes development of a continuous four-lane roadway from Mexico through the United States (Arizona, Nevada, Utah, Idaho, and Montana) to Canada. In and north of the Tucson area, the corridor would follow I-10 to Interstate 8 near Casa Grande. Local area growth has resulted in increased travel demand, and truck traffic using I-10 has grown substantially and is expected to continue to grow, particularly because of increased trade with Mexico (ADOT 2010a).

Figure 1. Project location in state



In 2003, ADOT and seven other state departments of transportation completed the National I-10 Freight Corridor Study, which predicted that truck movement would double by 2025. In 2009, a High Capacity Transit System study for the Tucson metropolitan area was completed; it recommended that the section of I-10 within the project limits be a high capacity transit route (ADOT 2010a).

In 1990, ADOT completed an I-10 design concept report that recommended improvements to the freeway from the Pinal-Pima County line to Ruthrauff Road. Improvements to I-10 from Tangerine Road to Ruthrauff Road were studied in an EA approved by FHWA in October 1993 (with a finding of no significant impact); these improvements were incorporated into a General Plan developed for I-10 (ADOT 1993). Based on the General Plan, Stage I (30%) design plans were developed that include eight main line lanes, new I-10 bridges over the crossroads, raising of the I-10 profiles to increase clearances, new TI ramps, and one-way frontage roads (ADOT 1993).

Eastbound and westbound I-10 frontage road improvements were completed in 2002 from Ina Road to 29th Street (approximately 7 miles south of the project limits), providing two-lane one-way frontage roads and supplemental capacity during subsequent construction on I-10. Construction of the I-10, Prince Road to 29th Street, improvement project through downtown Tucson was completed in 2009 and provided eight through lanes on I-10, with auxiliary¹ lanes between freeway ramps. Reconstruction of the Prince Road TI commenced in late 2011—this project will include a crossroad over I-10 and the Union Pacific Railroad (UPRR) and will provide for eight through lanes on I-10, thus continuing the northward widening of I-10 to the current eastern project limit. Similarly, another study has commenced to address I-10 improvements beyond the current western project limit. In addition, ADOT and the Town of Marana recently completed construction of the new I-10, Twin Peaks Road TI, located approximately 4 miles west of Ina Road, which provides a crossroad I-10 and UPRR.

¹ An auxiliary lane is an additional lane between on-ramps and off-ramps that provides a longer distance for the weaving movements of drivers who are entering and exiting the interstate.

II. Project Purpose and Need

A. Purpose and Need

1. Project Need

Improvements within the study area are needed to:

- meet approved transportation plan objectives
- provide additional traffic capacity and improve traffic operations on the I-10 main line and related TIs
- upgrade roadways and bridges to meet current design standards
- eliminate motor vehicle conflicts with the railroad

Each of these needs is discussed in detail in the following paragraphs.

Meeting Existing Transportation Planning Objectives

ADOT's existing General Plan for I-10 from Tangerine Road to Ruthrauff Road recommended improvements to I-10 that include: widening the freeway to eight through lanes, constructed within the inside median; adding auxiliary lanes between Sunset and Orange Grove Roads and between Orange Grove and Ina Roads; adding two-lane off-ramps at the end of auxiliary lanes; reconstructing the TIs to have ramps connect with the one-way frontage roads; reconstructing the Sunset Road and Ruthrauff Road TIs to full diamond interchanges; widening crossroads; improving drainage; and improving utilities (ADOT 1993). These improvements were based on travel demand forecasts for 2010. ADOT has completed the construction of two-lane one-way frontage roads between Ruthrauff and Ina Roads, along with associated ramp construction, drainage, and utility relocation work. However, no main line widening has been implemented.

The Regional Transportation Authority (RTA) was established in 2004 by state legislation and manages the \$2.1 billion, 20-year *Regional Transportation Plan* (RTP) funded through a Pima County-wide sales tax approved by voters in 2006. The RTA will fund the following improvements in the study area:

- railroad overpasses to eliminate at-grade rail crossings at Ina and Ruthrauff Roads (construction anticipated for the period from 2015 to 2018)
- construction of Sunset Road from Silverbell Road to I-10 and from I-10 east to River Road; includes a three-lane road with bike lanes (for the period from 2018 to 2020)

Improvements are needed in the study area to meet state and local transportation plan objectives. Sunset Road connections to I-10 are being planned by Pima County as part of a separate project.

Improving Traffic Capacity and Operation

Congestion of roadways and intersections is measured by capacity analyses according to procedures contained in the *Highway Capacity Manual* (Transportation Research Board 2010). Capacity is defined by level of service (LOS), which is expressed as letters A to F, with LOS A representing the best operating conditions and LOS F representing the worst (see Figure 3).

For road segments, LOS can be determined by the average travel speed of vehicles or by the vehicle density per lane mile (26 to 35 vehicles per lane mile for LOS D, to over 45 vehicles per lane mile for LOS F). For intersections, LOS is determined by the average time that vehicles are delayed at the intersection (ADOT 2010a). During morning and evening peak-hour traffic, ADOT considers LOS D acceptable for the urban setting characteristic of the study area.

Figure 3. Level of service flow conditions







Level of Service	Flow Conditions	Technical Descriptions
LOS A		Free flow conditions with minimal delays. minimum congestion
LOS B		Stable flow conditions with occasional delays. minimum congestion
LOS C		Stable flow conditions with periodic delays. low congestion
LOS D		Restricted flow conditions with regular delays due to moderate congestion. moderate congestion
LOS E		Constrained flow conditions with extended delays due to high congestion. high congestion
LOS F		Forced flow conditions with excessive delays due to excessive congestion. very high congestion

Table 1 identifies traffic volumes and LOS under existing and forecast conditions on I-10. Freeway segments currently operate at LOS D or better during peak traffic hours; however, in 2040, freeway segments would operate below acceptable conditions (LOS E) (ADOT 2010a).

Table 1. Average daily traffic and level of service for Interstate 10 segments, without improvements

Interstate 10 segment	Existing conditions (2009)		Future conditions with no improvements (2040)	
	ADT ^a	LOS ^b	ADT	LOS
Westbound				
Ina Road to Orange Grove Road	45,647	C	98,400	E
Orange Grove Road to Sunset Road	51,188	D	101,100	E
Sunset Road to Ruthrauff Road	51,918	D	95,600	E
Eastbound				
Ina Road to Orange Grove Road	47,377	C	84,700	E
Orange Grove Road to Sunset Road	53,507	D	87,600	E
Sunset Road to Ruthrauff Road	53,424	D	92,300	E

Source: ADOT 2010a

^a average daily traffic ^b level of service

Table 2 identifies traffic delays and LOS for existing and forecast conditions for intersections near I-10. Existing intersections at Ina and Orange Grove Roads currently operate at a deficient LOS, and all study area intersections would operate at a deficient LOS in 2040.

Table 2. Delay (in seconds) and level of service for key intersections near Interstate 10, without improvements

Intersection	Existing conditions (2009)		Future conditions with no improvements (2040)	
	Delay ^a	LOS ^b	Delay ^a	LOS
Ina Road at eastbound frontage road	40.9	D	>50	F
Ina Road at westbound frontage road	>50	F	>50	F
Ina Road at Camino de Oeste	>50	F	>50	F
Orange Grove Road at eastbound frontage road	>50	F	>50	E
Orange Grove Road at westbound frontage road	>50	F	>50	F
Orange Grove Road at Thornydale Road	39.8	D	>50	E
Sunset Road at eastbound frontage road ^c	11.3	B	>50	F
Sunset Road at westbound frontage road ^c	10.9	B	44.4	E
Ruthrauff Road at eastbound frontage road	46.4	D	>50	F
Ruthrauff Road at westbound frontage road	25.5	C	>50	F
Ruthrauff Road at Davis Avenue	34.6	C	>50	F

Source: ADOT 2010a

Note: The worst delay and LOS, either for the morning or evening, is represented in the table.

^a A delay greater than 50 seconds indicates that demand exceeds the intersection capacity and an exact measurement of delay times cannot be determined.

^b level of service ^c This scenario assumes the Sunset Road traffic interchange has a connection to River and Silverbell Roads.

Traffic capacity deficiencies have also resulted in long queues that cause traffic to stop on the freeway and ramps at the following locations:

- eastbound frontage road at Orange Grove Road during the morning peak hour
- westbound frontage road at Ruthrauff Road during train crossings
- westbound frontage road at Ina Road during the evening peak hour

Existing deficiencies would be exacerbated in 2040 based on increased vehicular and rail traffic. According to the Pima Association of Governments (PAG), approximately 50 to 65 UPRR trains pass through the study area each day. UPRR is currently constructing improvements within its right-of-way (ROW) to double track its line to accommodate additional rail traffic. Rail traffic would be expected to nearly double by 2040.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users [Public Law 109-59, 119 Stat. 1144 (August 10, 2005)] highlights the cost of congestion as follows:

The cost of congestion, which negatively affects the U.S. economy, quality of life, and air quality, has risen dramatically in the last 25 years despite record levels of transportation investment. Some economists estimate that the overall cost of congestion to the U.S. economy approaches \$200 billion a year ... Since congestion relief projects also reduce idling, the negative emissions impacts of “stop and go” driving, and the number of vehicles on the road, they have a corollary benefit of improving air quality... The Department [of Transportation] believes State and local governments can simultaneously reduce the costly impacts of congestion while also improving air quality.

This statement indicates a strong relationship between traffic congestion, air quality, and adverse economic impacts. Based on the above considerations, improvements are needed to address existing and future LOS deficiencies, improve traffic operation, reduce resulting congestion and air quality impacts, and avoid resultant adverse economic impacts.

Upgrading Roadway to Meet Design Standards

I-10 in the study area was constructed in the 1960s. Because design standards are refined over time, areas within project limits do not meet current American Association of State and Highway Transportation Officials standards (ADOT 2010b), as summarized in Table 3.

Table 3. Roadway design elements differing from existing standards

Element	Location
Stopping sight distance ^a	Westbound frontage road just north of Ruthrauff Road
	Ruthrauff Road at Interstate 10 undercrossing and at railroad crossing
Bridge heights	Interstate 10 westbound bridges at Ina and Ruthrauff Roads
	Interstate 10 eastbound bridges at Orange Grove and Sunset Roads
Pavement width	Westbound entrance ramp at the Ina Road traffic interchange
Grade ^b	One location on Ruthrauff Road

^a Stopping sight distance is the distance required by a vehicle traveling at the design speed to stop before reaching a stationary object that has suddenly appeared in its path.

^b Steep inclines reduce the speed of large or heavy trucks and increase the time required to stop a vehicle going downhill.

Therefore, improvements are needed to bring the roadway and bridges to current design standards.

Reducing Vehicle-Train Conflicts

At-grade railroad crossings have a higher potential for serious vehicle-train collisions than grade-separated railroad crossings. Currently, the crossroads at Ina Road and Ruthrauff Road cross the railroad at-grade, while Orange Grove Road is grade-separated. If a future extension of Sunset Road from I-10 east to River Road is built, a railroad crossing would be required.

Trains crossing at grade impose direct delays on vehicular traffic and interrupt nearby traffic signal operations, resulting in even more delays (ADOT 2010a). Waiting for a train to pass an at-grade crossing can result in delays for emergency response personnel, both in responding to incidents west of the railroad tracks and in transporting patients to Northwest Medical Center located east of I-10. St. Mary's Hospital is located west of I-10 approximately 6 miles south of project limits; nonetheless, the existing conditions hamper a flexible emergency response. The Northwest Fire District confirmed that the railroad is a potential source of delay closely monitored in the course of an emergency response.² At Cortaro Road, located west of Ina Road, delays resulting from train traffic ranged from 1.4 to 3.3 minutes; such delays are expected to be similar at Ina and Ruthrauff Roads (ADOT 2005a). Conflicts would increase as UPRR completes double-tracking its line, thereby increasing railroad traffic through the study area. The traffic study (ADOT 2010a) recommends railroad grade separations to eliminate conflicts between train and vehicular traffic.

Therefore, improvements are needed to minimize train-vehicular conflicts and improve emergency response times.

2. Project Purpose

The purpose of the proposed project is to address each of the needs identified above. The objectives of the proposed improvements include:

- accommodate planned transportation improvements in ADOT and RTA transportation plans
- improve existing and future LOS and reduce traffic operation deficiencies
- improve roadways and bridges to meet current design standards
- eliminate vehicle-train conflicts at crossroads and improve emergency response times

² personal communication with Cheryl Horvath, Northwest Fire District Operations Division Chief, October 13, 2011

B. Conformance with Regulations, Land Use Plans, and Other Plans

Proposed improvements should conform to currently adopted transportation and land use plans of area planning jurisdictions. The location and function of I-10 are well-established in the area, and local jurisdictions have long considered and reflected this transportation facility in their planning efforts, recognizing both the constraints and opportunities afforded by this facility. Similarly, I-10 improvement, including widening, has been established since 1993 in ADOT's General Plan for I-10 from Tangerine Road to Ruthrauff Road (ADOT 1993). The following documents were reviewed to evaluate the proposed project's conformance:

- *Marana 2010 General Plan* (Town of Marana 2010)
- *PAG High Capacity Transit System Plan* (PAG 2009a)
- *PAG 2040 Regional Transportation Plan* (PAG 2010)
- *Pima County Comprehensive Plan Update* (Pima County 2007)
- *Pima Regional Trail System Master Plan* (Pima County Natural Resources, Parks and Recreation and City of Tucson Parks and Recreation 2010)
- *City of Tucson General Plan* (City of Tucson 2001)
- *Tucson Regional Plan for Bicycling* (PAG 2009b)

The proposed project was found to conform to the above planning documents. Note that the *PAG 2040 Regional Transportation Plan* was updated in 2012 to reflect the proposed improvements (PAG 2012).

III. Alternatives

This chapter summarizes the development and evaluation of alternatives for the proposed project and identifies the Build Alternative and No Action Alternative further evaluated in this EA.

A series of analyses were applied to build alternatives considered for this project. These analyses began with very simple qualitative criteria and progressed through a series of successively more detailed analyses as the alternatives were refined. The first criterion used was to determine whether a proposed alternative met the project's purpose and need as defined in the previous part of this EA. If the alternative met the purpose and need, it was advanced for additional study; if it did not meet the purpose and need, it was eliminated from additional consideration. The initial development of alternatives considered various roadway improvements and the provision or improvement of other travel modes in the study area. Each of these topics is discussed in the following sections.

A. Alternatives Considered

1. No Action Alternative

In addition to being a requirement under NEPA, a discussion of the No Action Alternative provides a baseline against which all other alternatives (or the Build Alternative) are compared. In addition, the No Action Alternative may have social, economic and environmental impacts that must be considered. The No Action Alternative is described in further detail in Section C, *Alternatives Considered for Further Study*, below.

2. Modal Alternatives

To determine whether other transportation modes would meet the stated purpose and need for the project, the *PAG High Capacity Transit System Plan* (PAG 2009a) was reviewed. This study produced a high-capacity transit (HCT) system plan for the PAG region. The plan defined incremental, sustainable, and cost-effective steps for the implementation of HCT technologies to serve existing and future regional travel demand.

According to this study, commuter rail transit is envisioned as the long-term HCT solution connecting Marana, north of Tucson near the I-10 corridor, with Tucson. This system would use heavy rail with high operating speeds over long distances with few stops. However, it would be over 20 years until this system would be cost-effective. In the short- and mid-term, express bus service and bus rapid transit would be used, respectively. Currently, Sun Tran's Route 104X, Marana-Downtown Express, provides express bus service from a park-and-ride lot at Cortaro Road to downtown Tucson. According to the study, the express bus service demand will be monitored to determine when implementation of bus rapid transit would be justified, but implementation of bus rapid transit is not anticipated for a minimum of 10 years.

HCT systems would not meet the proposed project's purpose and need. HCT systems, by themselves, would not provide additional capacity, improve traffic operations, correct design issues, nor eliminate vehicle conflicts with trains. However, roadway network improvements, by reducing congestion and increasing capacity, would make HCT systems more functional and efficient. Therefore, improvements to the roadway network were examined and modal alternatives were eliminated from further consideration.

3. Roadway Network Improvements

Improvements to the roadway network were examined to determine whether, by providing improvements to the existing roadway network, the stated project purpose and need would be met. Each component of the stated purpose and need is briefly discussed below.

Part II indicated that improvements are needed in the study area to meet state and local transportation planning objectives. To meet these planning objectives, additional I-10 main line capacity and grade separations of crossroads with UPRR are needed. Providing roadway network improvements such as the I-10 main line widening and grade separations of the crossroads and UPRR would meet this identified need.

As discussed in Part II, improvements are needed in the study area to reduce congestion and improve the LOS on the I-10 main line and at the crossroads for the 2040 design year. Although freeway segments currently operate at LOS D or better during peak traffic hours, by 2040 freeway segments would operate below acceptable conditions (LOS E or F). According to the traffic report, acceptable 2040 traffic operations and capacity would be realized by providing additional through and auxiliary lanes on I-10, dedicated turn lanes at the crossroads and frontage roads, and additional traffic signals at certain unsignalized intersections (ADOT 2010a). Tables 4 and 5 demonstrate the improvements in LOS along the I-10 main line and at key intersections near I-10 that would result from implementation of these roadway improvements.

Table 4. Existing and projected level of service for Interstate 10 segments

Interstate 10 segment	Existing conditions (2009)	Future conditions with no improvements (2040)	Future conditions with improvements ^a (2040)
Westbound			
Ina Road to Orange Grove Road	C	E	C
Orange Grove Road to Sunset Road	D	E	C
Sunset Road to Ruthrauff Road	D	E	C
Eastbound			
Ina Road to Orange Grove Road	C	E	C
Orange Grove Road to Sunset Road	D	E	C
Sunset Road to Ruthrauff Road	D	E	C

Source: ADOT 2010a

^a assumes the Sunset Road traffic interchange has a connection to River Road and Silverbell Road

Using current design standards, roadway network reconstruction would correct issues related to existing roadways not meeting current design standards for stopping sight distance, pavement widths, and roadway grades, and would increase the height of the bridges over the Rillito Creek and Cañada del Oro Wash to meet floodway requirements.

Reconstruction of the I-10 main line and the crossroads would also result in grade separation of the crossroads and UPRR. The resulting grade separations would improve emergency access and prevent vehicle conflicts with trains.

Table 5. Existing and projected level of service for key intersections near Interstate 10

Roadway segment	Existing conditions (2009)	Future conditions with no improvements (2040)	Future conditions with improvements ^a (2040)
Ina Road at eastbound frontage road	D	F	D
Ina Road at westbound frontage road	F	F	C
Orange Grove Road at eastbound frontage road	F	E	C
Orange Grove Road at westbound frontage road	F	F	C
Sunset Road at eastbound frontage road	B	F	B
Sunset Road at westbound frontage road	B	E	C
Ruthrauff Road at eastbound frontage road	D	F	C
Ruthrauff Road at westbound frontage road	C	F	C
Ruthrauff Road at Davis Avenue/Maryvale Avenue ^b	C	F	C

Source: ADOT 2010a

Note: The worst LOS, either in the morning or evening, is represented in the table.

^a assumes the Sunset Road traffic interchange has a connection to River Road and Silverbell Road

^b Davis Avenue for the existing and no improvement conditions; Maryvale Avenue with improvements

Therefore, roadway network improvements that would widen the I-10 main line, grade separate the crossroads and UPRR, provide auxiliary lanes on I-10 and dedicated turn lanes on the crossroads and frontage roads, add traffic signals to unsignalized intersections, increase the height of bridges over the Rillito Creek and Cañada del Oro Wash, improve stopping sight distances, increase pavement widths, and decrease roadway grades where needed were advanced for further study.

Alternative Corridor Evaluation

A series of alternatives to the roadway network were examined. These alternatives included roadway system improvements along an alternative corridor location and design alternatives within the existing I-10 corridor.

I-10 was constructed within the study area in the 1960s, and the crossroads were connected to the predecessor of I-10, the Casa Grande Highway (State Route [SR] 84). As such, the existing transportation network is well-established, and local jurisdictions have based land use decisions and economic development plans on these existing crossroad corridors for many decades. Recent transportation planning and improvement efforts have similarly assumed the continued use of these existing I-10 and crossroad corridors. Therefore, alternative corridor locations were eliminated from further study.

Designs for Crossroad Grade Separations

Grade separation of crossroads could be accomplished by constructing overpasses over I-10 and UPRR, constructing underpasses under I-10 and the railroad, or leaving the crossroads at-grade and reconstructing the railroad to pass over or under the crossroads.

Grade changes for a railroad must be gradual, extending over a great distance. Depressing the railroad would also require the railroad to be below the Cañada del Oro Wash and the Rillito Creek, which is considered infeasible and impractical based on engineering and cost considerations. Therefore, reconstructing the railroad under the crossroads was eliminated from further study. Table 6 provides a detailed comparison of the balance of configurations.

Table 6. Grade separation configuration comparisons

Evaluation criteria	Relative unit of measure	Crossroad under Interstate 10 and UPRR ^a	Crossroad over Interstate 10 and UPRR	UPRR over crossroad
Engineering and cost considerations				
ROW ^b requirements	Planning-level extent and cost	▶ ROW needed adjacent to reconstructed TIs ^c and for construction of temporary railroad at Sunset and Ruthrauff Roads; at least 30 acres	● ROW needed adjacent to reconstructed TIs; approximately 20 acres	■ Over 7 miles adjacent to railroad ROW for temporary railroad during construction; 50 acres (approximately 7 acres per mile)
Ease of construction	Time required to construct and complexity of construction	▶ Temporary railroad realignment and underpass construction	● Shortest construction time and simplest construction	■ Temporary railroad realignment ; railroad elevated throughout project area
Construction and design cost	Planning-level estimate	▶ Moderate: UPRR bridges, Interstate 10 bridges over crossroads; temporary railroad realignment; extensive retaining walls	● Least: large TI structures over freeway and railroad; extensive retaining walls	■ Highest: railroad bridge over crossroads; temporary railroad realignment; new railroad bridges over Cañada del Oro Wash and Rillito Creek required
Traffic operation	Activities where crossroads are closed to traffic	▶ During temporary railroad realignment and underpass construction	● Closed during TI reconstruction	▶ During temporary railroad realignment and railroad bridge construction
Utility impacts	Utility displacements and relocations	■ Extensive: along crossroads and local roads; along UPRR ROW at TIs; plus petroleum and 72-inch wastewater lines	▶ Moderate: along crossroads and local roads; along UPRR ROW at TIs	■ Extensive: along crossroads and local roads; along UPRR ROW at TIs; plus petroleum and 72-inch wastewater lines
Cost of future expansion	Cost/ease of expanding railroad or traffic capacity	▶ Moderate: increasing traffic capacity much more expensive	● Least: increasing UPRR or traffic capacity least expensive	▶ Moderate: expansion of UPRR capacity much more expensive
Maintenance	Special maintenance requirements	■ Maintain pumping facilities with each storm; railroad bridges	● None	▶ Railroad bridges
Agency coordination and input				
Preferences of local governments	Expressed views of local jurisdictions	■ Discouraged because of maintenance issues	● Preferred because of maintenance issues	No preference indicated
Preferences of railroad and ACC ^d	Policies of UPRR and ACC	▶ Both discourage underpasses, which limit expansion and increase maintenance	● Both preferred; minimize impacts on railroad	▶ Both discourage bridges if avoidable; limit expansion and increase maintenance
Railroad, ACC coordination	Time needed to obtain railroad, ACC approval	■ 30–39 months	● 12–17 months	■ 30–39 months

(continued on next page)

Table 6. Grade separation configuration comparisons (continued)

Evaluation criteria	Relative unit of measure	Crossroad under Interstate 10 and UPRR ^a	Crossroad over Interstate 10 and UPRR	UPRR over crossroad
Environmental impacts				
ROW	Acreage and nature of requirements	▶ At least 30 acres; includes businesses and residences	● 20 acres; includes businesses and residences	■ 50 acres; includes businesses and residences
Visual resources	Obtrusiveness of improvements	● Depressed structures would not be as prominent	▶ Elevated structures would be more visible; art treatments viable	▶ Elevated structures would be more visible; art treatments viable
Clean Water Act Section 404/401	Impacts on waters of the United States	● Minimal impacts to waters	● Minimal impacts to waters	▶ New UPRR bridges over Cañada del Oro Wash and Rillito Creek
Noise levels	Traffic noise impacts to nearest developed properties	● Depressed structures would cause less traffic noise	▶ Elevated arterial streets would generate more noise	■ Elevated UPRR would create more noise
Stormwater runoff concerns	Infrastructure needed to control runoff	▶ Pumping required; collection along crossroads	● Collection along crossroads	● Collection along crossroads

Notes: ● = least impacts, ▶ = moderate to fair impacts, ■ = worst impacts

^a Union Pacific Railroad ^b right-of-way ^c traffic interchanges ^d Arizona Corporation Commission

As shown in Table 6, constructing the crossroads over I-10 and UPRR would require the least ROW, cost the least, relocate the fewest utilities, be preferred by local governments, have fewer impacts on the railroad, be the easiest to construct while keeping crossroads open, be easier to expand in the future, have the same or fewer environmental consequences, avoid the need for runoff pumping facilities, and have the shortest construction time. Constructing the crossroads over I-10 and UPRR was advanced for further analysis.

Traffic Interchange Configurations

TI reconstruction is being considered for Ina, Sunset and Ruthrauff Roads. Several alternative TI configuration options were considered, including a diverging diamond interchange, a single point urban interchange, and a tight diamond interchange. See Appendix A for descriptions and representations of these TI types. Table 7 provides a detailed comparison for each TI configuration.

As shown in Table 7, the tight diamond interchange would have the lowest ROW and bridge costs, would have the fewest impacts on utilities, would be consistent with other TI types within the region, would have the most efficient traffic operations, would have the same relative environmental effects as the other alternatives, and would be the simplest and most efficient to construct. The tight diamond interchange was advanced for further consideration.

Table 7. Traffic interchange comparisons

Evaluation criteria	Relative unit of measure	Diverging diamond interchange	Single point urban interchange	Tight diamond interchange
Construction and design cost	Planning-level estimate	► Larger bridge structure (50,800 square feet)	■ Largest bridge structure (59,000 square feet)	● Smallest bridge structure (41,800 square feet)
ROW ^a cost	Planning-level estimated ROW requirements	■ Additional ROW needed, including UPRR ^b	● Could be constructed within existing ROW	● Could be constructed within existing ROW
Utility impacts	Utility displacements and relocations	■ Relocation at frontage road and along crossroad; extensive encroachment on utilities in UPRR ROW (petroleum and 72-inch wastewater lines)	● Relocation at frontage road and along crossroad; minor encroachment on utilities in UPRR ROW	● Relocation at frontage road and along crossroad; minor encroachment on utilities in UPRR ROW
Driver expectancy	Familiarity of local drivers with interchange configuration	■ None in Arizona	► Two in Tucson metropolitan area	● All interchanges on Interstate 10 west of Interstate 19 use this configuration
Traffic operation	Driver delays and issues with bicycles and pedestrians	► Less delay than single point urban interchange, but difficult to accommodate frontage roads	■ Average delay of 45.7 seconds, difficult to accommodate frontage roads, pedestrians	● Average delay of 31.4 seconds, easier to accommodate bicycles, pedestrians
Ease of construction	Time to construct, complexity of construction	■ ROW acquisition from UPRR and complex construction	► Largest bridge structure to construct	● Shortest construction time and simplest construction
Environmental considerations		No major difference between alternatives' environmental impacts.		

Notes: ● = least impacts, ► = moderate to fair impacts, ■ = worst impacts

^a right-of-way ^b Union Pacific Railroad

B. Alternatives Considered but Eliminated from Further Study

Based on the analysis described in the previous section, alternatives or design options were eliminated from further study as follows:

- alternative transportation modes
- alternative corridor locations
- grade separation options: railroad underpasses, UPRR over crossroad, crossroad under I-10 and UPRR
- TI configurations: diverging diamond interchange, single point urban interchange

C. Alternatives Considered for Further Study

Alternatives advanced for further study were the No Action Alternative and the Build Alternative; both are described in the following sections.

1. No Action Alternative

Under the No Action Alternative, no major operation or capacity improvements would be made to I-10 within the study area, and no reconstruction of the TIs would occur. Other improvements already programmed in the 2040 *Regional Transportation Plan* would occur, and they would include: improvements to Ina Road west of I-10, extension of and at-grade connection of Sunset Road to I-10 from Silverbell Road to the west and River Road to the east,³ and widening of La Cañada Drive and La Cholla Boulevard, north-south roadways east of I-10. In addition, minor improvements such as signal phasing optimization, routine maintenance, and pavement resurfacing would occur.

Because no increase in capacity would occur, by 2040 segments of I-10 are projected to operate at LOS E or worse during peak hours (see Table 1), and Ina, Orange Grove, Sunset, and Ruthrauff Roads are projected to operate at LOS E or worse during peak hours (see Table 2). This means that vehicle densities would increase (vehicle densities range from 26 to 35 vehicles per lane mile for LOS D to over 45 vehicles per lane mile for LOS F), which would increase congestion, lengthen travel times, increase idle times, potentially impair emergency vehicle response times, and negatively affect air quality. The No Action Alternative would not meet the project purpose of increasing capacity and improving operations, accommodating planned transportation improvements, eliminating vehicle-train conflicts, and improving emergency response. The No Action Alternative is further evaluated in Part IV of this EA.

2. Build Alternative

The Build Alternative involves the expansion of the I-10 main line to accommodate five travel lanes in each direction with auxiliary lanes between on-ramps and off-ramps. Existing TIs would be improved by constructing crossroads over I-10 and the railroad at Ina, Sunset, and Ruthrauff Roads. The I-10 main line would generally follow the existing facility profile, except at the crossroads of Ina, Sunset, and Ruthrauff Roads where it would be lowered to accommodate the crossroad over, and at the Cañada del Oro Wash and Rillito Creek, where it would be raised to provide sufficient floodway clearance. Currently, I-10 is elevated to go over the crossroads at Ina, Sunset, and Ruthrauff Roads. The proposed improvements would lower the I-10 profile in these areas to allow the crossroads to pass over I-10. At Orange Grove Road, I-10 would be raised to provide sufficient clearance under the new bridges. Frontage roads would be elevated at the crossroads to connect with signalized intersections. Specific improvements are further detailed in the following sections (also see Figure 4).

³ Sunset Road connections to I-10 would be made by Pima County, but under the No Action Alternative, Sunset Road would remain at-grade so that I-10 would cross over Sunset Road and there would be no grade separation of Sunset Road and UPRR. Under the Build Alternative, Sunset Road would cross over I-10 and UPRR.

Improvements to Interstate 10 Main Line, Frontage Roads, Crossroads, and Traffic Interchanges

The following improvements would be made to I-10 within the project limits:

- Main line reconstruction would provide five 12-foot-wide travel lanes in each direction, with 12-foot-wide auxiliary⁴ lanes between TI entrance and exit ramps. Initial construction would provide four travel lanes in each direction; a fifth lane would be constructed at an undetermined date in the future. See Figure 5 for typical sections of both the initial and ultimate configurations. See *Project Phasing and Implementation* at the end of this part of the EA for further discussion.
- Two-lane exit ramps and two-lane entrance ramps would be configured to accommodate future ramp metering.
- Ina Road, Sunset Road, and Ruthrauff Road TIs would be reconstructed to provide tight diamond interchanges with elevated crossroads that bridge the freeway and the railroad. See Figure 6 for a rendering of the proposed TI configuration using Ruthrauff Road as an example. At crossroad approaches, ramps and frontage roads would be raised to meet the elevated crossroad.
- Traffic signals would be added to the Sunset Road/frontage road ramp terminal intersections.
- Two right-turn lanes on the westbound frontage road at Orange Grove Road would be provided.
- New bridges would be built to provide sufficient width and vertical clearance at each overpass and sufficient freeboard over the Rillito Creek and Cañada del Oro Wash.
- Sidewalks would be provided on crossroads for pedestrian use and paved shoulders would be provided on frontage roads and crossroads for bicyclist use.
- Lighting would be installed along the main line, at ramp gores, and at signalized intersections.
- Freeway Management System elements would be installed, such as conduit and pull boxes for future ramp metering, new automatic traffic recorder stations, new count stations, new dynamic message signs, and upgraded closed-circuit television cameras.

Drainage Improvements

The following drainage improvements would be made within the project limits:

- Structures would be replaced or extended (culverts, storm drains) to facilitate widening, accommodate new structure locations, or support the weight of additional fill.
- Cross drainage would be conveyed at Ina and Ruthrauff Roads west to the Santa Cruz River through existing or new pipes if additional capacity is needed.
- Facilities would be constructed to collect surface drainage on the northern and southern sides of Ruthrauff Road—flows on the southern side would be conveyed to the northern side at Highway Drive and the railroad abutment, and then would be conveyed west toward the Santa Cruz River.
- Construct a closed roadway pavement drainage system.

⁴ The auxiliary lane is an additional lane between on-ramps and off-ramps that provides a longer distance for the weaving movements between entering and exiting traffic along the interstate.

Figure 4. Build Alternative

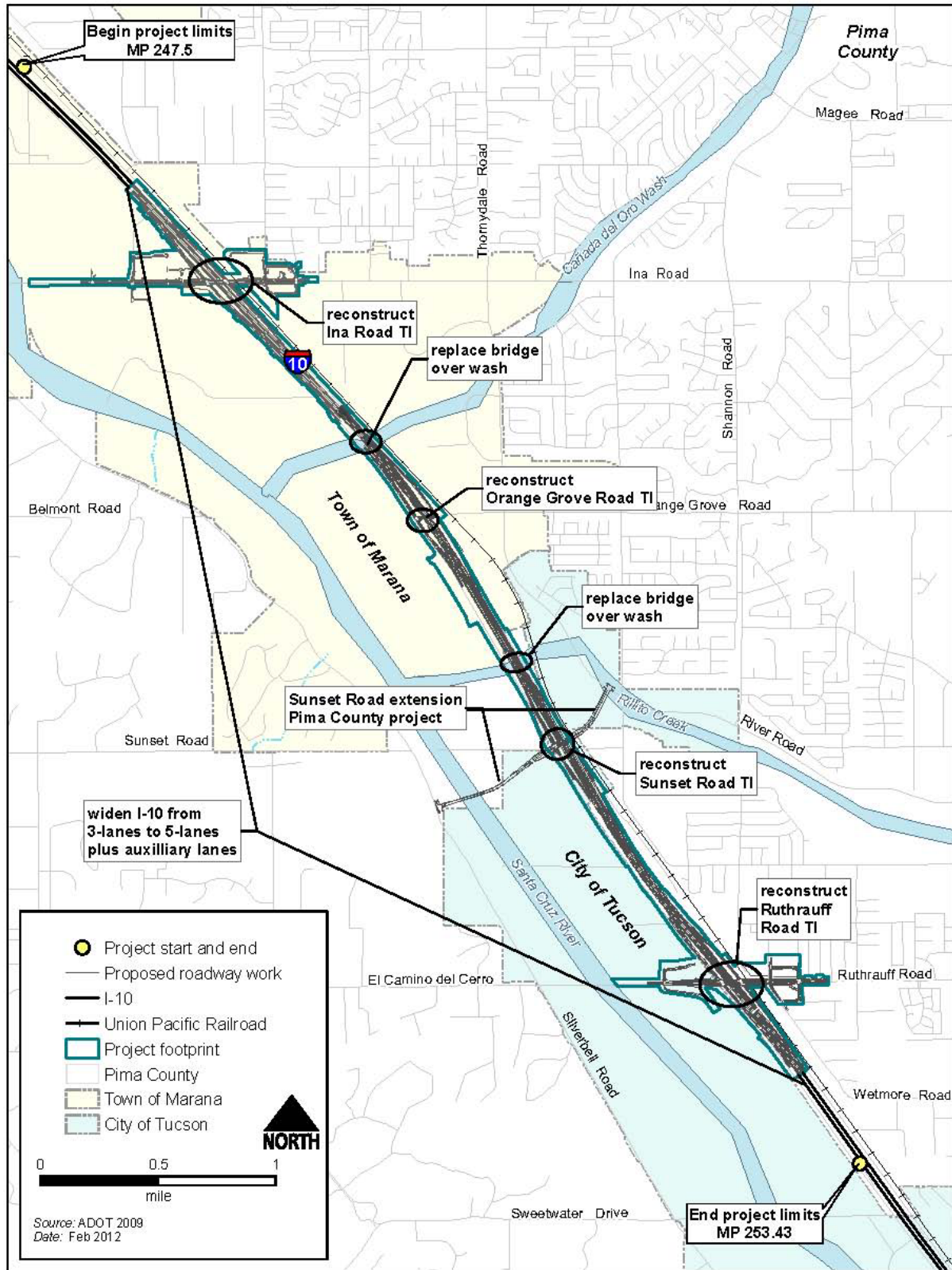
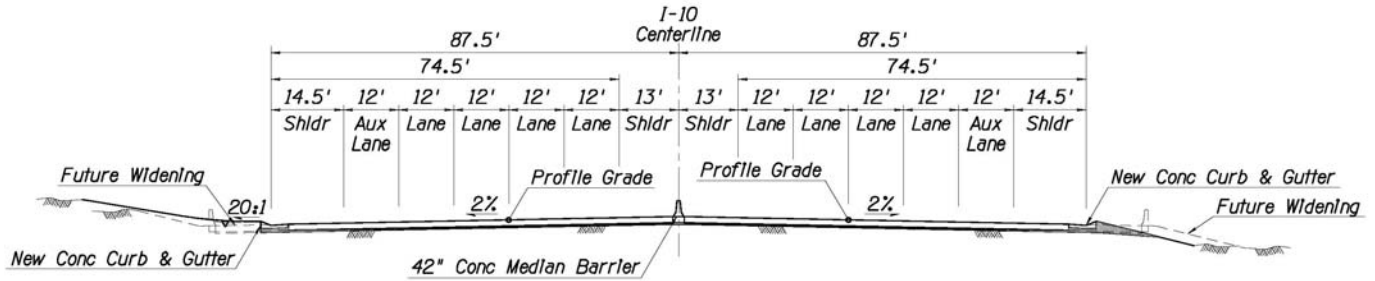


Figure 5. Typical sections

Initial configuration with 8 through lanes and 2 auxiliary lanes



Ultimate configuration with 10 through lanes and 2 auxiliary lanes

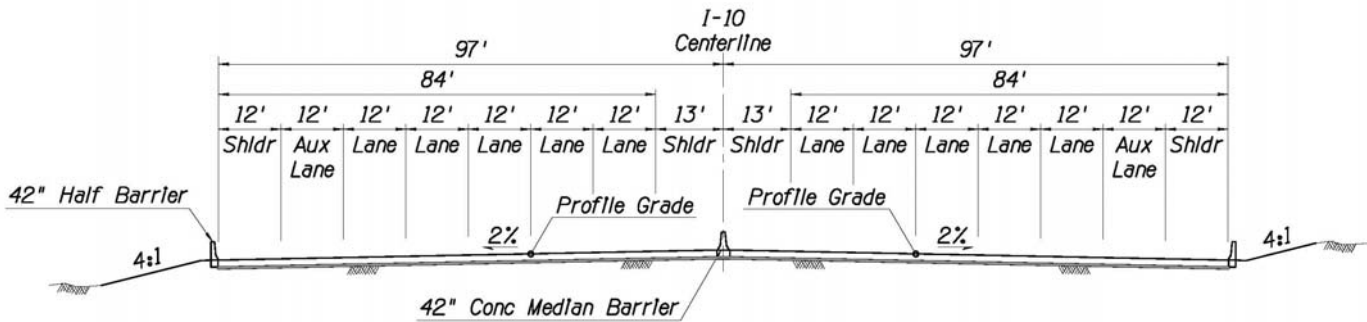


Figure 6. Rendering of traffic interchange at Ruthrauff Road/El Camino del Cerro, looking southeast



Local Access Considerations

Reconstruction of TIs would result in elevation changes for Ina, Sunset, and Ruthrauff Roads, which would affect access to these roads from local streets and driveways. No access changes have been identified at Orange Grove Road. Access changes were designed to accommodate commercial and emergency vehicles according to ADOT guidelines. The access changes also minimized direct and indirect impacts to properties, and considered input from local jurisdictions and property owners. The resulting access changes are illustrated in Figures 7 and 8 and are discussed in greater detail below.

Access along Ina Road

West of the I-10/Ina Road TI, some driveways onto Ina Road and the eastbound frontage road would be eliminated because of the elevation difference between the roadway and the property, as well as ADOT access control standards that indicate that the first right-turn/driveway be no closer than 300 feet from the frontage road return. A new raised median would also restrict turning movements across Ina Road east of Starcommerce Way. A new signalized intersection is proposed at the intersection of Starcommerce Way and Ina Road, along with new access roads north of Ina Road to facilitate property access in this area (see Figure 7).

Similarly, east of the TI, direct access to Ina Road between the TI and Camino de la Cruz would be eliminated.⁵ An Ina Road bridge would be constructed over Camino de Oeste to provide additional circulation north and south of Ina Road. Camino de la Cruz would be signalized at its intersection with Ina Road and would be realigned as part of a connector loop road to facilitate access to properties north and

⁵ Some right-in access on Ina Road may be feasible and would be evaluated further in the final design phase.

south of Ina Road. Camino de la Cruz would be aligned to discourage traffic from continuing immediately north into the residential area. New east–west connector roads would be constructed north and south of Ina Road.

Access along Ruthrauff Road/El Camino del Cerro

The crossroad in this area is known as Ruthrauff Road east of I-10 and El Camino del Cerro west of I-10. West of the TI, some driveways onto El Camino del Cerro would be eliminated because of the elevation difference between the roadway and the property and ADOT access standards. A new raised median would also restrict turning movements across El Camino del Cerro east of Business Center Drive. Business Center Drive, which is used as an access road by Pima County for its wastewater treatment plant, would be realigned with the road just west of the ServiGas business. A new east–west connector road would be constructed north of El Camino del Cerro (see Figure 8).

Similarly, east of the I-10 TI, direct access to Ruthrauff Road would be eliminated between the TI and Maryvale Avenue/Parkview Drive. A Ruthrauff Road bridge would be constructed over Davis Avenue/North Highway Drive to provide additional circulation north and south of Ruthrauff Road. Parkway Drive would be signalized at its intersection with Ruthrauff Road and would be realigned with Maryvale Avenue as part of a connector loop road to facilitate access to properties north and south of Ruthrauff Road. Maryvale Avenue would be aligned to discourage traffic from continuing immediately north into the residential area. New east–west connector roads would be constructed north and south of Ruthrauff Road.

Access along Sunset Road

Existing access at the I-10/Sunset Road TI is limited to Sunset Road west of I-10. Access is provided by an unpaved road that terminates at the Santa Cruz River. California Portland Cement (CPC) is the only property owner with access to Sunset Road in this area.

Pima County has initiated a study of Sunset Road from Silverbell Road (west of the Santa Cruz River) to River Road, which is east of the Rillito Creek. Pima County’s project would connect to Silverbell Road on the west, construct a new bridge over the Santa Cruz River, tie into the reconstructed eastbound and westbound frontage roads built as part of this ADOT project, construct new bridges over the UPRR tracks and Rillito Creek, and tie into River Road on the east.

Because the reconstructed frontage roads at Sunset Road would be elevated, a temporary, one-lane, at-grade roadway would be provided between the beginning and ending of the elevated segment of the eastbound frontage road to provide access to the existing Sunset Road. This interim connection would remain in place until the Pima County project is completed (see Figure 9).

In the ultimate configuration, with ADOT and Pima County improvements completed, access along Sunset Road would be provided in accordance with ADOT access control standards. CPC access to Sunset Road would likely be consolidated and provided at a median opening approximately 1,320 feet west of the Sunset Road/eastbound frontage road intersection.

Right-of-way Requirements

ADOT ROW is sufficient along much of the project length to accommodate proposed improvements. New ROW would be needed adjacent to the eastbound frontage road at the Ina Road, Sunset Road, and Ruthrauff Road TIs; adjacent to Ina Road and Ruthrauff Road to widen these crossroads; and north and south of Ina Road and Ruthrauff Road to provide local street improvements and to construct new connector roads.

Figure 7. Local access at Ina Road

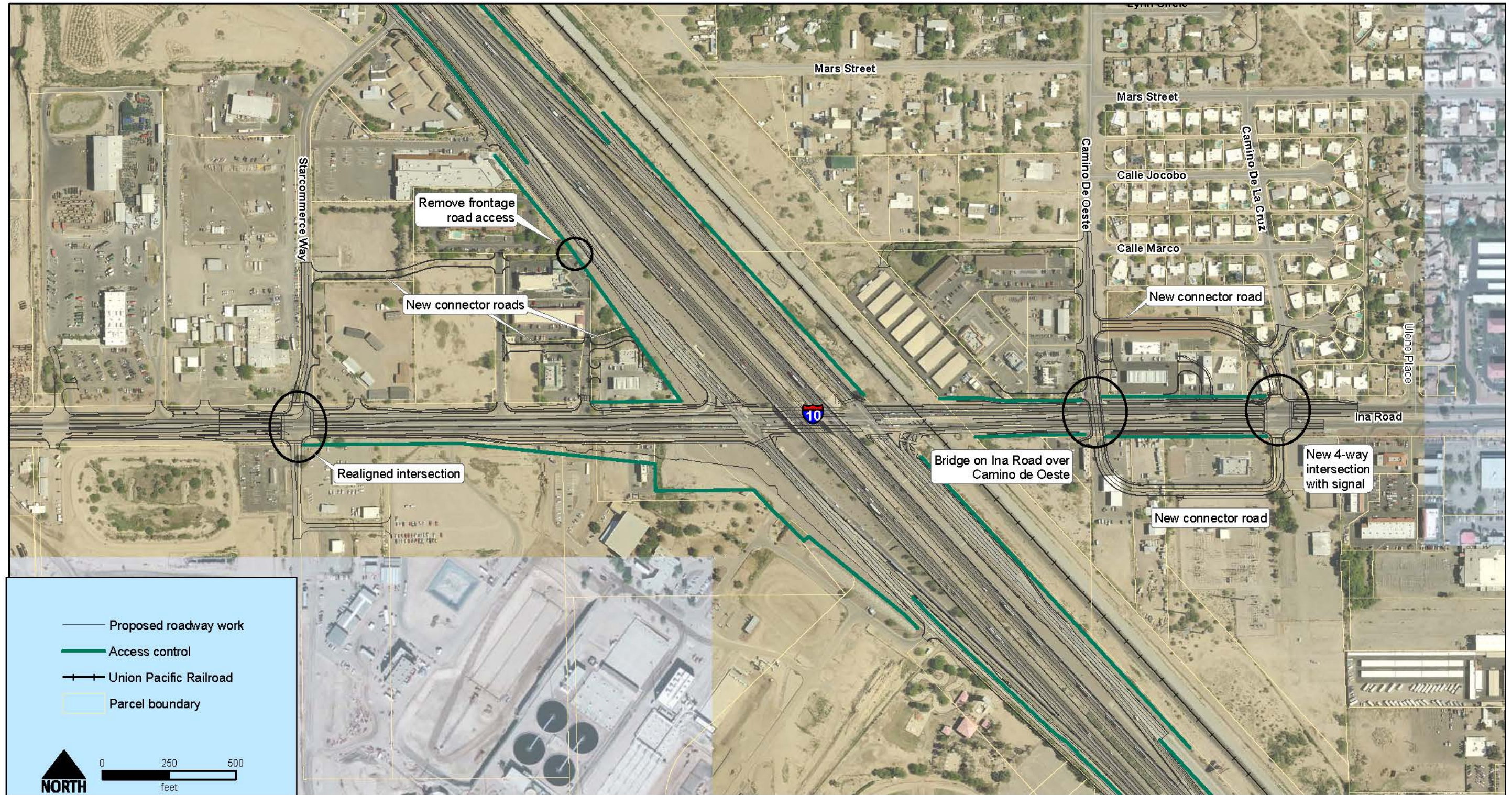


Figure 8. Local access at Ruthrauff Road/El Camino del Cerro

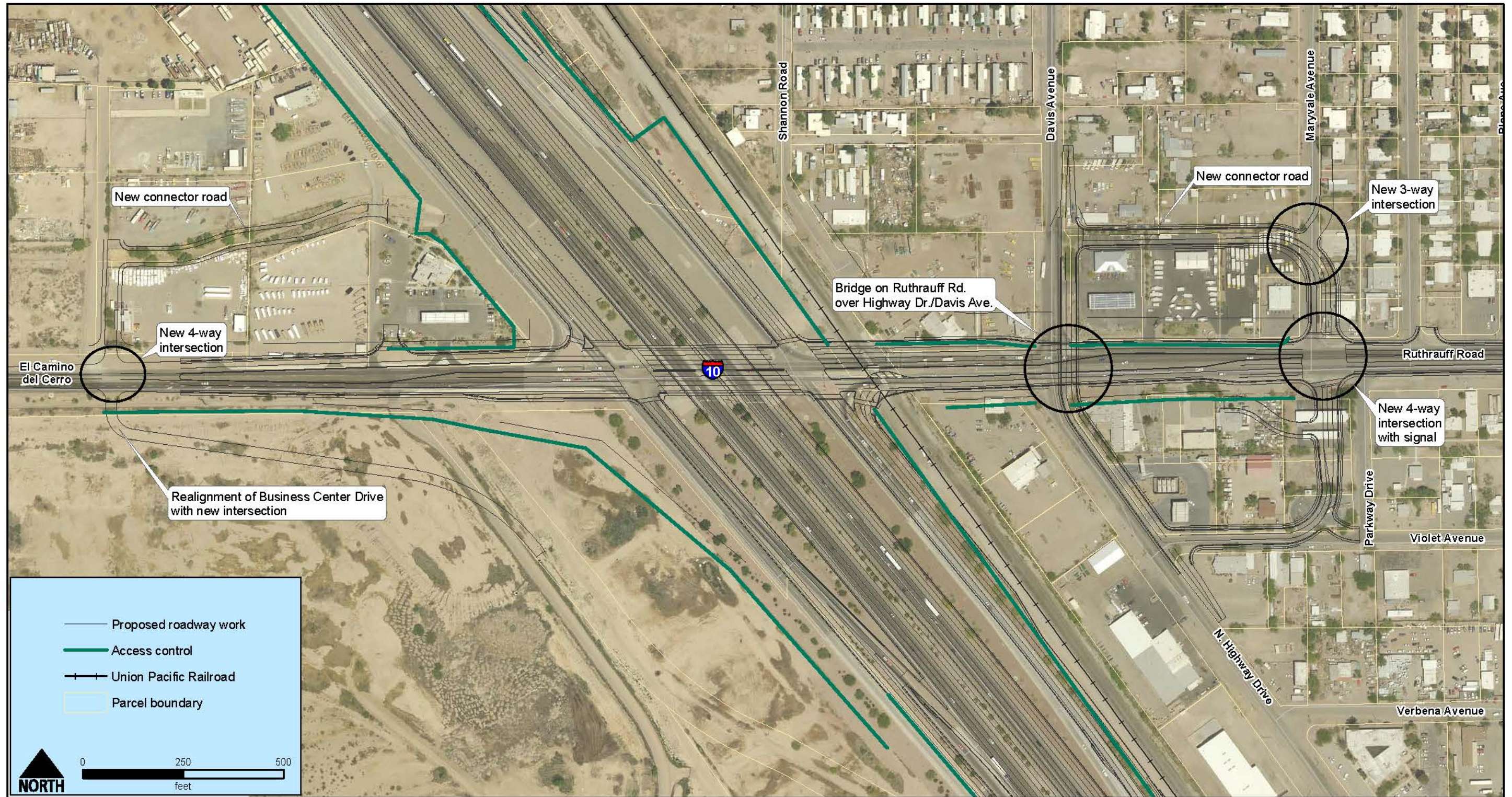
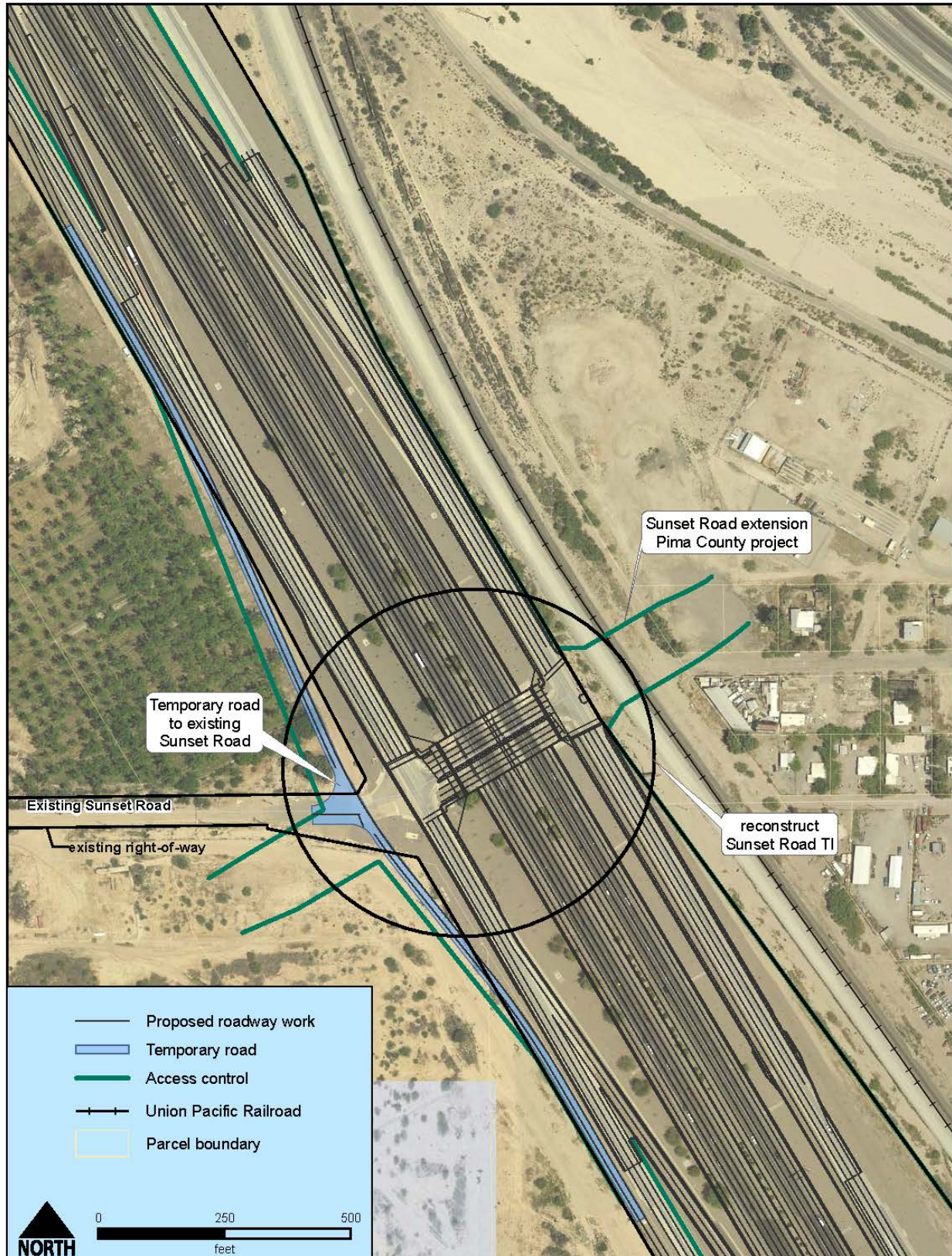


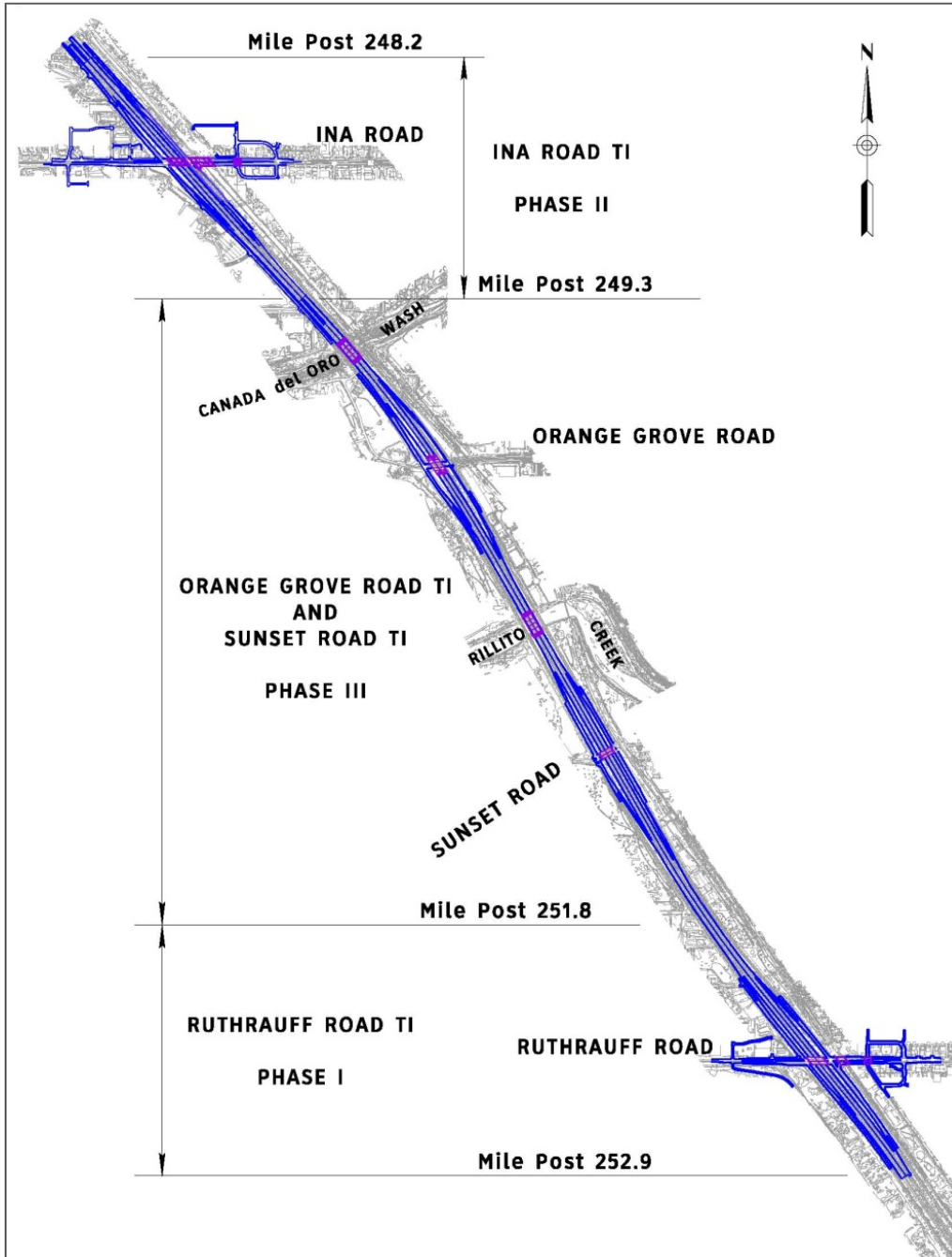
Figure 9. Sunset Road interim condition



Project Phasing and Implementation

The Build Alternative would involve the widening of nearly 5 miles of I-10, full reconstruction of three TIs, plus improvements at Orange Grove Road. Given the scale of the work, cost, and construction duration, the project would be implemented in phases involving multiple construction projects. A project implementation plan was developed by ADOT in conjunction with local jurisdictions. It identifies the recommended construction sequencing and components associated with individual construction projects (see Figure 10).

Figure 10. Project phasing and implementation



- **Phase I – I-10/Ruthrauff Road TI:** This phase would include reconstruction of the Ruthrauff Road TI, including local circulation improvements; construction of structures, including bridges over I-10,⁶ UPRR, and Davis Avenue/Highway Drive; reconstruction of frontage roads to match into Ruthrauff Road; reconstruction of the I-10 exit and entrance ramps; and reconstruction of the I-10 main line from MP 251.8 to 252.9 (southern project limit), including eight through lanes of traffic and auxiliary lanes. The eight-lane section for I-10 would be constructed to the median side in order to match into the adjacent I-10 improvements that are being built by ADOT as part of the Ruthrauff Road to Prince Road project. The ultimate configuration for the frontage roads and crossroads would be constructed in conjunction with this initial work so that the major structures, such as the culverts, retaining walls, and crossroad bridges, would accommodate the ultimate I-10 improvements without modifications. Construction would begin in 2015, and would last approximately 24 months.
- **Phase II – I-10/Ina Road TI:** This phase would include reconstruction of Ina Road TI similar to the Ruthrauff Road TI and would involve main line reconstruction from MP 248.2 (northern project limit) to MP 249.3. I-10 would be paved for eight lanes, but would be striped for only six lanes to maintain lane continuity; striping for eight lanes would occur following improvement of the segment to the south as the final part of the Phase III work. Construction would begin in the first half of 2016 and would last approximately 24 months. While construction would overlap with Phase I work, no TI closure overlap would be allowed.
- **Phase III – I-10/Orange Grove Road and Sunset Road TIs:** This phase would include improvements to I-10 from MP 249.3 to 251.8, including reconstruction of the main line, provision of eight through lanes, and reconstruction of the bridges over the Cañada del Oro Wash, Orange Grove Road, and the Rillito Creek. The Sunset Road TI would be reconstructed to accommodate Sunset Road going over I-10 and the UPRR, and would also include restriping of the Phase II segment for eight lanes on I-10. Construction would begin in the first half of 2018 and would last approximately 24 months.

This phase would be closely coordinated with Pima County, which is planning to construct Sunset Road from Silverbell Road, west of I-10, to River Road, east of I-10.

It is anticipated that the Pima County project would be constructed between July 2016 and June 2021, which is approximately the same time frame projected for the interstate improvements at the Sunset Road TI. Also see previous discussion in this section on *Access along Sunset Road*.

- **Phase IV– I-10 main line widening to ten through lanes with auxiliary lanes:** This phase would involve paving and widening of bridges for Cañada del Oro Wash, Orange Grove Road, and the Rillito Creek. The construction year would depend on timing of future capacity needs and funding availability, and would last approximately 12 months.

During reconstruction of TIs, the affected TI would need to be closed for a large portion of the construction duration, estimated to be 15 to 18 months. Within each construction project, local access management improvements would likely be advanced to facilitate local road operation during TI construction.

⁶ Bridges over I-10 including Ruthrauff Road, Ina Road, and Sunset Road would be at the ultimate width and location to accommodate ten through lanes on the main line, although only eight lanes would be provided in Phases I–III.

The timing of each project phase would be subject to change depending on the availability of funding, completion of environmental requirements, design, and local considerations. Phase I and II improvements are listed in the 5-year Transportation Improvement Program (TIP); however, adjustments are proposed to support the previously described schedule.

IV. Affected Environment, Environmental Consequences, and Mitigation Measures

This part of the EA describes the affected (existing) environment within the study area and presents the potential effects of the Build Alternative and the No Action Alternative. Mitigation measures to avoid or minimize impacts have been identified and are consolidated in the *Mitigation Measures* section of this EA.

A. Issues Eliminated from Detailed Study

The following resources were eliminated from further evaluation because it was determined that these resources do not occur within the study area: wild and scenic rivers, wetlands, Bald and Golden Eagle Protection Act, national natural landmarks, Land and Water Conservation Fund Act and Section 6(f) facilities, wilderness areas, and prime or unique farmland.

B. Land Ownership, Jurisdiction, and Land Use

Land ownership is identified in terms of public or private ownership. Jurisdiction implies the authority to regulate land uses. Land use is a description of the existing occupation or physical use of land.

1. Existing Conditions

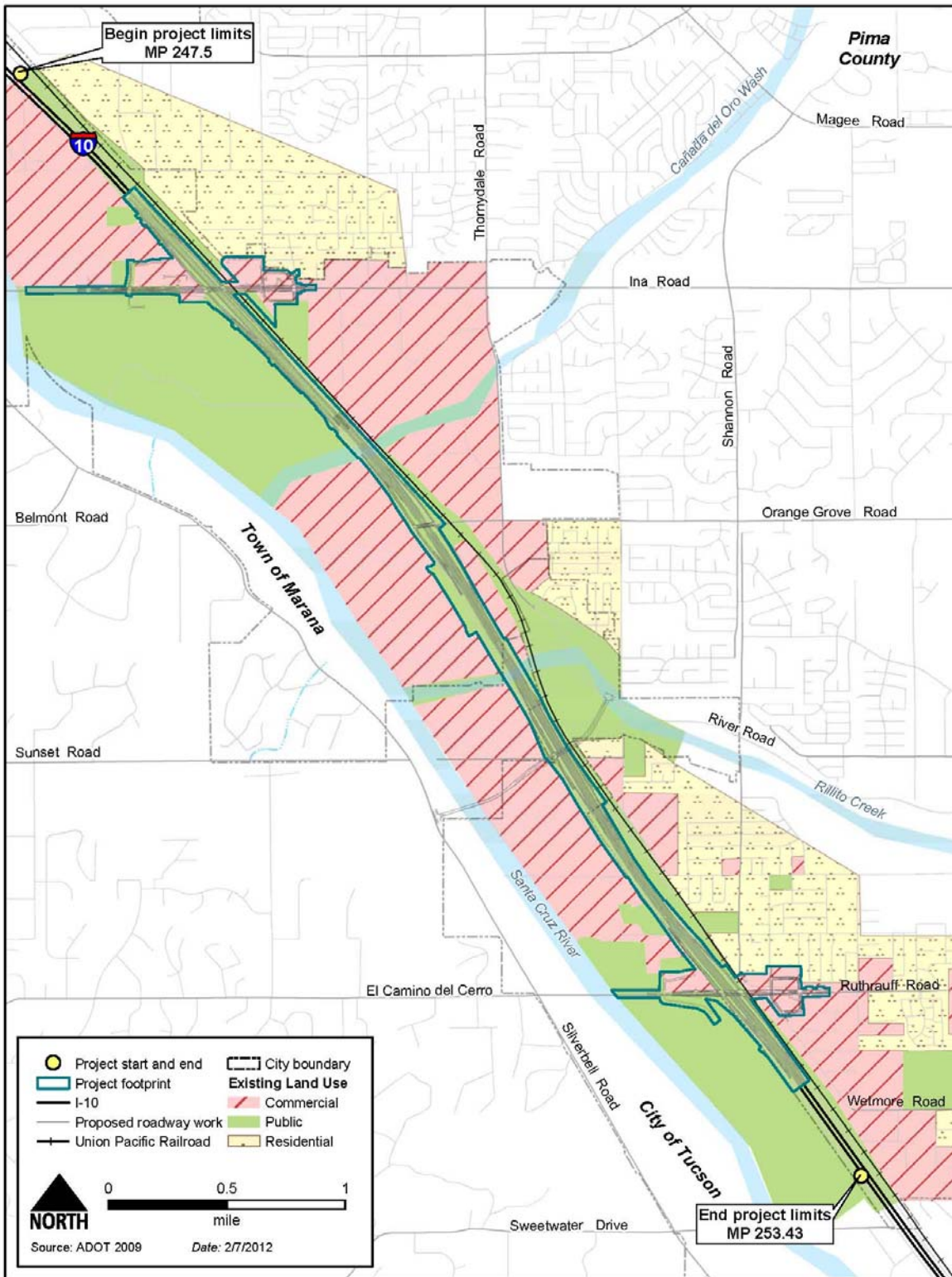
Land ownership in the study area is predominantly private, and the primary land uses are commercial, industrial, residential, public/quasi-public, transportation (UPRR and roadways), floodway, parks, sand/gravel extraction and vacant, and public (municipal) as depicted in Figure 11. Land use in the study area is under the jurisdiction of the Town of Marana, City of Tucson, and Pima County (see Figure 4 in the previous section). Municipal landowners include ADOT, Town of Marana, Pima County, and City of Tucson.

2. Build Alternative

The Build Alternative would require approximately 20 acres of new ROW, with approximately 9 acres associated with the Ruthrauff Road phase of the project, nearly 10 acres associated with the Ina Road phase of the project, and less than 2 acres associated with the Orange Grove and Sunset Roads phase of the project. Anticipated acquisition would convert approximately 14 acres of private land and 6 acres of public land into a transportation facility.

On a land use basis, the project would convert nearly 14 acres of commercial, less than 0.5 acre of residential, less than 2 acres of park, nearly an acre of UPRR land, and approximately 3.5 acres of other municipal uses (utilities, wastewater, etc.) to a transportation use. The Build Alternative would have direct permanent impacts on a number of commercial properties (see Part VI, Section C, *Social and Economic Considerations*, for further discussion on displacements). The remaining adjacent commercial land use would remain suitable for this land use with access to properties facilitated by the proposed local access road improvements. Other land uses adjacent to the project limits would not be altered by the Build Alternative. The improvements would be consistent with transportation and land use elements of local jurisdictions.

Figure 11. Existing land use⁷



⁷ Existing land use is approximated. Actual land use within an area may include a mix of commercial and residential uses within the predominant land use being represented in the map. Public land may include publicly owned vacant or undeveloped land used for flood control, or planned for municipal use (parks, wastewater treatment), as well as railroad and utilities.

3. No Action Alternative

Under the No Action Alternative, no changes in ROW, easements, property acquisition, or access would occur, and there would be no impacts to land ownership or land use.

4. Mitigation Measures

Arizona Department of Transportation Design Responsibilities

- Acquisition would be conducted through an assistance program in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 Code of Federal Regulations § 24), which identifies the process, procedures, and time frame for right-of-way acquisition and relocation of affected residents or businesses.

C. Social and Economic Considerations

Social and economic considerations include relocations and displacements, access to existing properties, emergency access, impacts on existing businesses, and impacts on neighborhood continuity, community services, schools, and recreation facilities. These topics are further addressed below.

The Tucson metropolitan area has a population of approximately 980,263 (2010 Census), and the study area has a population of approximately 18,317,⁸ with most residences east of I-10. Like much of Arizona, Tucson experienced rapid growth over roughly a decade beginning in the mid 1990s, with growth dramatically slowing in the last 5 years because of economic conditions. East of I-10, the study area is mostly built-out with commercial development along the crossroads and residential areas north of Ruthrauff and Ina Roads. West of I-10, the project area is a combination of commercial and municipal uses, with some undeveloped areas planned for future municipal uses.

1. Existing Conditions

Businesses and Residences

Businesses are present along both sides of Ina Road, Ruthrauff Road/El Camino del Cerro, and along the eastbound and westbound frontage roads. Residences are present on the eastern side of I-10 north of Ina and Ruthrauff Roads and also east of the westbound frontage roads. Municipal uses (wastewater treatment, landfill) are located primarily west of I-10, adjacent to Ina Road and El Camino del Cerro. CPC operates a sand and gravel extraction facility adjacent to the eastbound frontage road west of I-10 and owns over 500 acres of land adjacent to the eastbound frontage road west of I-10 between the Cañada del Oro Wash and El Camino del Cerro. CPC's primary excavation pit is between Cañada del Oro Wash and Rillito Creek and main access is at Orange Grove Road.

Access and Emergency Access

Portions of the study area currently experience poor LOS, including backup of traffic onto I-10; see Part II, Section A, *Purpose and Need*. In addition, rail traffic crossing Ina and Ruthrauff Roads results in traffic delays. Similarly, emergency responders that need to respond to an incident or convey patients across the railroad experience delays when rail traffic is present.

⁸ Total population of census block groups overlapping the study area is based on 2010 Census, as depicted in Figure 12b.

Emergency response to the area is provided by Northwest Fire District and Rural/Metro Fire Department, with police service provided by the Arizona Department of Public Safety, Town of Marana Police Department, Pima County Sheriff's Department, and City of Tucson Police Department. No emergency response facilities are within the study area; however, a temporary police substation is planned beginning in 2012 at the Marana Operations Center; it would be adjacent to the proposed project. Four fire stations are within 2 miles of the study area, with stations on both sides of I-10. The nearest hospital providing emergency care is Northwest Medical Center, located on the southeastern corner of Orange Grove Road and La Cholla Boulevard. Police facilities in the area are limited; however, police response is usually from patrolling vehicles assigned to an area.

Economic Conditions

The main sources of employment within the study area are commercial, government, and utilities. The I-10 corridor provides access to restaurants, hotels, and other retail commercial centers predominantly located east of I-10 along the major crossroads. Other economic or employment centers include the Marana Operations Center, Northwest Medical Center, two wastewater treatment plants located west of I-10, Tucson Electric Power substation, a complex of motels north of the Ina Road TI, and the sand and gravel operation located west of I-10 between Ina and Sunset Roads.

Community Services

Residential neighborhoods are present east of I-10: north of Ina Road, at Sunset Road, and north of Ruthrauff Road. Connectivity within neighborhoods is provided by existing local streets. With the exception of Davis Avenue/North Highway Drive, there are no north-south streets with signalized intersections to provide easy pedestrian access across Ina Road and Ruthrauff Road east of I-10. Ina Road has a median that may provide some pedestrian refuge, but Ruthrauff Road features a painted median. Major crossroads (Ina, Orange Grove, Sunset, and Ruthrauff Roads) and the Rillito Creek trail provide pedestrian access across I-10.

Community services within approximately 1 mile of the project limits include medical facilities, park-and-ride lots, bus stops, a post office, schools, recreational facilities, and municipal facilities, although there are few facilities within or adjacent to the project limits. Mike Jacobs Sports Park and Ted Walker Park are adjacent to the eastbound frontage road south of Ina Road. The Marana Operations Center is adjacent to the project limits at Ina Road and Starcommerce Way; it provides a police substation and a water bill paying location. There are no educational facilities within the project limits; however, these facilities exist within the study area.

SunTran provides bus service within the project limits: four express routes on I-10, three express routes and one Sun Shuttle route on Ina Road, one express route on Orange Grove Road, and one regular route on Ruthrauff Road. A park-and-ride lot is on the southern side of Ruthrauff Road between Parkway Drive and Kain Avenue, at the Victory Assembly of God property, and is part of a SunTran route.

A park-and-ride lot is adjacent to the westbound frontage road, just north of Ruthrauff Road, but is not part of the SunTran system. The park-and-ride lot was added during ADOT's construction of the frontage roads where there was excess land. The lot was not developed in response to any demonstrated need and experiences minimal usage—on average two cars per day. The lot is not included in any regional transportation or air quality plan.

Tucson and Marana host seasonal events that may incrementally increase traffic and use of particular routes during certain times of the year. These events include golf tournaments, the Tucson Gem and Mineral Show, and a number of cycling events. The transportation management plan and construction sequencing would consider these events and how traffic control or construction activities might be modified to provide improved traffic operation during peak times associated with seasonal events.

2. Build Alternative

The Build Alternative would require 20.4 acres of new ROW and would permanently displace 2 residences, 13 commercial properties, and 1 City of Tucson property (and potentially displace residents/tenants); partial ROW acquisition of 52 nonresidential properties would occur (see Tables 8 and 9).

Direct access to the crossroads near the TIs would be eliminated because of the changes in grade on Ina Road and Ruthrauff Road/El Camino del Cerro. This condition would create the need for new access locations, including new intersections and connector roads, to maintain traffic patterns and provide access to properties in these areas. Additional area would be needed for drainage improvements to convey flows across crossroads and under I-10, especially at Ruthrauff Road. Therefore, the elimination of current access, the implementation of new local access roads, and the completion of drainage improvements would have direct impacts to properties. The majority of the acquisitions needed are north and south of Ina Road and Ruthrauff Road/El Camino del Cerro Road near the TIs with I-10.

Table 8. Commercial and municipal displacements (full acquisition)

Business name and ownership	Address	Parcel No. ^a	Acreage
Ina Road vicinity			
Starbucks; Tucson Sunrise Properties LLC	4905 W. Ina Road	214-01-007M	1.30
Car Quest Auto Parts, Donut Wheel, Auto Repair Shop; MCC Property Holdings LLC	4522, 4524, 4528 W. Ina Road	225-36-014D	0.50
Vacant building (former Circle K); RI CSI LLC	4500 W. Ina Road	225-36-014C	0.44
Casas Bonitas Development, Good Realty Group, Inc.; Rossco LLC	4460 W. Ina Road	225-37-0250	0.21
Cheryl K. Copperstone, Attorney; Jahanbakhsh and Patricia Khamsehzhadeh	7211 N. Camino de la Cruz	225-37-0260	0.19
Enterprise Rental Car; Robins Inc. Plaza, LLC	4545 W. Ina Road	101-05-010C	0.89
Ruthrauff Road vicinity			
ARCO/AM-PM Market; Khurana Management INC	2790 W. Ruthrauff Road	101-15-041P	1.14
Cruise America; Miller, Walter and Jennifer	2750 W. Ruthrauff Road	101-15-041Q	1.09
Penske Truck Rental; James Harold Matthews	2730 W. Ruthrauff Road	101-15-041M	0.85
Super H Market; Byubios Holdings LLC	2710 W. Ruthrauff Road	101-15-041D	0.34
Vromans Auto Body-Refinishing; Jeffrey W. Vroman	2729 W. Ruthrauff Road	103-07-0120	0.58
Cool Car Wash of Arizona LLC; Guwnig Investment Group LP	2705 W. Ruthrauff Road	103-07-011A	0.58
Vacant; Tucson Water Department	4767 N. Parkway Drive	103-07-018B	0.36
Firebird Fuel; Phoenix Fuel Company INC	4703 N. Parkway Drive	103-07-018A	0.36

^a Pima County Assessor's parcel number from Pima County Map Guide

The two residential full acquisitions are located on Camino de la Cruz north of Ina Road and are associated with local access road improvements resulting from the realignment of Camino de la Cruz and the new connector road to Camino de Oeste.

Commercial displacements are adjacent to Ina and Ruthrauff Roads and near their TIs with I-10 (see Table 8). All full acquisitions would require the relocation of residences or businesses present. The affected City of Tucson property proposed for full acquisition is managed by the Tucson Water Department; the property is vacant with no plans for development.

Table 9 summarizes the impacts that would result from partial property acquisition. Most property impacts would involve the loss of frontage amenities such as fencing, landscaping, or signs. Twelve properties would have direct access to an adjacent roadway eliminated, with insufficient access resulting, and alternative access would be provided. Property owners would be compensated for loss of land and affected amenities consistent with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The use of most of the affected properties could continue in a similar function. However, four properties would experience greater impacts that may hinder their continued function (shaded properties in Table 9):

- Pima County well site – The new connector road construction may affect active or planned facilities.
- Gilbert Pump – Partial acquisition would involve 0.57 acre of the 2.02-acre property (28 percent), including the demolition of a 4,800-square-foot building, relocation of an office trailer, and potential impacts on a second building on-site.
- Insearch Investments LLC – Partial acquisition would involve demolition of the only building on this commercial site.
- Neff Rental – Partial acquisition would require the demolition of the smaller of two buildings associated with this business.

Table 9. Commercial and municipal properties (partial acquisition)

Business and ownership	Address	Parcel No. ^a	Impacts
<i>Ina Road vicinity</i>			
Pima County Regional Wastewater Reclamation Department	5025 W. Ina Road	214-01-0100 214-01-007K	Frontage amenities (signs, fencing, and minor landscaping)
Valencia Decaf LLC, County Realty LLC	4907 W. Ina Road	214-01-007	Vacant
Union Pacific Railroad	Ina Road at railroad crossing	214-01-005B 221-38-002B	Full width ROW ^b north and south of Ina Road to accommodate new structures across railroad
Ina Freedom Self Storage, LLC	4676 W. Ina Road	221-38-001G	Eliminate direct access to Ina Road; rear access would be improved
Long John Silvers; G&L Properties LLC	4640 W. Ina Road	221-38-0460	Frontage landscaping, eliminate direct access to Ina Road
Jack in the Box; Edwin F. & Diane D. Thorp Trust	4600 W. Ina Road	221-38-0450	Frontage landscaping, eliminate direct access to Ina Road
Waffle House Inc.	4601 W. Ina Road	214-01-004A	Eliminate direct access to Ina Road; new access provided on Camino de Oeste

(continued on next page)

Table 9. Commercial and municipal properties (partial acquisition) (continued)

Business and ownership	Address	Parcel No.^a	Impacts
<i>Ina Road vicinity (continued)</i>			
Tucson Electric Power; Unisource Energy Corporation	4445 W. Ina Road	214-01-005A 101-05-008F	Landscaping, fencing
Chuy's Baja Broiler; Marlee Saguaro LLC; Edwards Ina Lee Mar Inc.	4505 W. Ina Road, 4499 W. Ina Road	101-05-1190	Frontage and rear landscaping, parking reduction, eliminate direct access to Ina Road.
Former service station (unoccupied); Danny K. & Jhonette Dobbs Revok Tr 70% & Genevieve Dobbs 30%	4479 W. Ina Road	101-05-008D	Eliminate west driveway to Ina Road
Marana (public ROW – alley)	North of Ina Road between Camino de la Cruz and Camino de Oeste	—	Convert public alley to road ROW
Circle K Stores Inc.	4540 W. Ina Road	225-36-014F	Frontage landscaping, relocate driveway to Ina Road farther east
Motel 6; Wade William Tr.	4630 W. Ina Road	221-38-0420	Frontage landscaping
<i>Ruthrauff Road vicinity</i>			
Jack in the Box, Chevron; Grant Road Industries, LLC	3030 W. El Camino del Cerro	101-20-040D	Eliminate access to El Camino del Cerro from property driveway
State of Arizona	West of I-10 ^c , south of El Camino del Cerro, adjacent to eastbound frontage road	103-66-0970	None identified
Unoccupied; Parsons Properties LLC	3060 W. El Camino del Cerro	102-20-040C	Loss of small metal building, fencing
Vacant; Ronal L. & Diane Gamble ET UX	3210 W. El Camino del Cerro	101-20-036K	None identified
Pima County well site	North of El Camino del Cerro adjacent to northern side of the ServiGas property	101-20-036C	Potential impact on well site
Comeau Properties LLC (commercial, light industrial)	3180 W. El Camino del Cerro	101-20-036N	Fencing, vegetation in existing wash
ServiGas; Heritage Operating LP	3170 W. El Camino del Cerro	101-20-036M	Fencing, storage area, vegetation in existing wash
State of Arizona drainage way	North of El Camino del Cerro adjacent to Stewart Title property	101-20-039A	Eliminate floodway; water would be piped to Ruthrauff Road storm drain
Vacant; City of Tucson	3145 W. El Camino del Cerro	103-04-001M	Potential impact to flood control berm
Union Pacific Railroad ROW	East of I-10 at Ruthrauff Road	103-06-091B 101-15-036B	Full width ROW impacts north and south of Ruthrauff Road to accommodate new structures across railroad
Gilbert Pump; Gilbert Properties	2840 W. Ruthrauff Road	101-15-039A	Loss of largest building and office trailer, parking, fencing, signs; eliminate direct access to Ruthrauff Road

(continued on next page)

Table 9. Commercial and municipal properties (partial acquisition) (continued)

Business and ownership	Address	Parcel No.	Impacts
Ruthrauff Road vicinity (continued)			
Weber Group, LLC; Insearch Investments LLC	2838 W. Ruthrauff Road, 4849 N. Davis Ave	101-15-040A	Loss of only building, storage, fencing; eliminate direct access to Ruthrauff Road
Unknown name; Ross Intertraders LLC	4844 N. Davis Ave	101-15-030A	Fencing, vegetation
Neff Rental; Atlas Holdings Three LLC	2819 W. Ruthrauff Road	101-07-066A	Loss of office building, parking, fencing; eliminate direct access to Ruthrauff Road
Associated with Penske Truck Rental; James Harold Matthews	4845 N. Maryvale Ave.	101-15-041J	Fencing
Whitney Burns Shutters, Inc.; RJ&K Investments Ltd. and O'Hair Partners LLC	2755 W. Ruthrauff Road	103-07-015B 103-07-014B	Frontage, parking, landscaping; eliminate property access to Ruthrauff Road; new access would be provided from the east side of the property
Commercial (unknown name); Hoke, Frank	2722 W. Violet Ave.	103-07-0170	Frontage landscaping
Pacific Pride Service station; LBI Investments Enterprises Limited	4700 N. Highway Drive	103-07-016A	Frontage landscaping
Casas Adobes Elks Lodge No. 2663	4684 N. Highway Drive	103-07-026C	Fencing, landscaping, storage, patio
Laborers Union, Hurst, Don and Brendaey	2713 W. Violet Ave.	103-07-026A	Fence, and possibly shade canopy
Frontage roads			
Marana drainage way	Adjacent to eastbound frontage road north of Starcommerce Way	226-35-005C	Drainage channel
Clayton Homes; Ina Road Group LLC	7400 N. Starcommerce Way	226-35-0210 226-35-02A	Vegetation, parking, signage, fencing; may affect some modular homes
Marana public ROW (Starcommerce Road)	Adjacent to eastbound frontage road	—	Existing ROW; use as road would continue
Harley Davidson of Tucson, Chilton Properties LLC	7355 N. I-10 Eastbound Frontage Road	226-35-019A	None identified
Red Roof Inn; R-Roof I LLC	4940 W. Ina Road	226-35-013G	Eliminate direct access to frontage road
Mike Jacobs Sports Park; Pima County	7051 N. Casa Grande Highway,	214-02-028A 214-01-0060 214-01-0030 214-02-028B 101-05-0200	Fencing, landscaping, parking, loss of some storage and shade structures
Pima County ROW (Walker Road)	Adjacent to eastbound frontage road	101-05-019A 101-05-0220	Existing ROW; use as road would continue
California Portland Cement (sand and gravel extraction); CPC Arizona Holdings Inc.	Adjacent to eastbound frontage road near Sunset Road	101-07-106P 101-18-004C	Fencing and vegetation along frontage; also see discussion in text on following page
Lance's RV Center; NSS RV Central OG Ltd. Partnership	6260 N. Travel Center Dr.	101-06-0740	Landscaping, drainage

^a Pima County Assessor's parcel number from Pima County Map Guide; dash indicates no parcel number was available.

^b right-of-way ^c Interstate 10

Relocation assistance would be provided for full acquisition of developed properties consistent with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. There is sufficient excess housing, office space, and infill properties appropriate for similar commercial use in the area to accommodate relocation in the vicinity. Many of the retail-oriented commercial properties depend on drive-by business and ease of access to attract customers. While there are properties in the vicinity that are likely to be suitable for many businesses, the location needs of a particular retail business vary. Therefore, relocation needs and compensation for impacts to each property would be evaluated on a case-by-case basis consistent with federal law. If a well were adversely affected by construction activities, well abandonment and compensation (e.g., drilling a new well) may be required; see Section K, *Water Resources*, for a discussion of potential wells in the project area.

Upon completion, the Build Alternative would improve the LOS for I-10 and the project vicinity. Crossroad bridges over the railroad would eliminate traffic delays resulting from railroad traffic at Ina and Ruthrauff Roads. Emergency access and response would be improved by better LOS and the elimination of train delays at Ina and Ruthrauff Roads. Access routes and locations for many individual properties would be modified.

Reconstruction of individual TIs would require closure of the TI for 15 to 18 months. Through traffic, including emergency access, would need to travel north or south of each TI to cross I-10. For instance, at Ina Road, vehicles east of I-10 would need to travel westbound on the frontage road to Cortaro Road to travel west, while vehicles west of I-10 would need to travel eastbound on the frontage road to Orange Grove Road. Silverbell and Thornydale Roads would be north-south alternatives to the one-way frontage roads. From El Camino del Cerro, Grant Road is the nearest east-west option because neither Prince Road nor Orange Grove Road extend west to Silverbell Road. Coordination with emergency responders during construction would minimize emergency response delays during construction.

Access to individual properties would be maintained during construction; however, construction zones are likely to be congested, and access routes may be circuitous. Local access road improvements would need to be completed in advance of the TI reconstruction to ensure continued access to properties within the project limits. Access to areas east of I-10 would be supported by a well-developed transportation network with multiple access points to I-10. However, access west of I-10 is more limited, as explained above.

Direct impacts to businesses would occur as a result of acquisition and change of access to properties. Some businesses would obtain access from the new connector loop road rather than directly to the crossroad. Businesses closest to the TI along the crossroad would be below the road grade and face one or more retaining walls instead of the at-grade crossroad, which would affect both views of and from the property. This condition may affect businesses that depend on visibility to obtain customers (e.g., fast food restaurants, convenience stores). This condition may be somewhat mitigated by local sign ordinances. The local jurisdictions have established standards and ordinances addressing land use, transportation, and development requirements. All three jurisdictions have ordinances that apply special standards for signs adjacent to freeway facilities in order to allow for higher signs and better visibility.

Eastbound frontage road reconstruction would occur adjacent to the CPC property at Orange Grove Road within existing ADOT ROW. Studies indicate that slopes between the eastbound frontage road and mining activities are stable; however, ADOT would further evaluate slope stability adjacent to mining activities and would, if required, apply engineering treatments to slopes or substrate. At Sunset Road, approximately 1.5 acres of new ROW would be acquired from CPC for reconstruction of the eastbound frontage road. This

area is approximately 0.5 mile south of CPC's main mining area and removed from current mining activities. This acquisition would affect fencing and vegetation along the property frontage, including pecan trees.

East of I-10, both north and south of Ina and Ruthrauff Roads, new connector loop roads would replace access to existing properties and provide efficient local traffic operation (see Figures 7 and 8). The proposed connector loop roads involve the realignment of existing intersections to consolidate the location for traffic to intersect with the crossroad. The loops also feature new east–west roads to connect the newly aligned intersections with existing north–south roads. West of I-10 and north of Ina Road and El Camino del Cerro, new east–west connector roads are proposed to provide property access and facilitate eastbound left turns onto the crossroad (see Figures 7 and 8).

The new access condition may affect businesses that depend on ease of access to obtain customers. However, overall traffic operation would improve because traffic delays associated with the railroad would be eliminated, overall efficiency of the TI would be improved, and local circulation would be improved with the new connector loop roads. This would be a favorable condition for most businesses in the long-term.

In addition, the new east–west roadway connectors would improve access for some vacant areas, which may provide development opportunities for those properties. This would be a positive economic benefit.

I-10 and Orange Grove Road would remain open during project construction; however, TI closures would be required for approximately 15 to 18 months during reconstruction of the Ina, Sunset, and Ruthrauff Road TIs. Only one TI would be closed at a time. Therefore, access to adjacent TIs would be maintained during construction. Access to all properties would be maintained during construction; however, construction activities and traffic control would contribute to traffic congestion, resulting in more travel time to access properties. The congestion and access conditions may deter some customers during project construction on a temporary basis. Small businesses affected by reconstruction of the Ina Road or Ruthrauff Road TIs would be eligible for assistance from the RTA's Main Street business assistance program.⁹

Because the primary purpose of the new connector loop road at Ina Road is to provide a route for commercial traffic to Camino de Oeste, the road would be configured to favor traffic in this direction and discourage commercial traffic from continuing northbound on Camino de la Cruz into the residential area (see Figure 7). Land use patterns and street layouts are similar in residential areas north of Ruthrauff Road. As with Camino de la Cruz, Maryvale Avenue would be configured to favor commercial traffic west to Davis Avenue and to discourage commercial travel from continuing northbound through residential areas (see Figure 8). These configurations would also preserve the cohesion of the residential neighborhood and separate it from commercial uses. Landscaping amenities are also recommended to provide a visual separation between commercial and residential uses for both areas. Improvement of Camino de la Cruz at Ina Road and Maryvale Avenue at Ruthrauff Road would also provide a signalized north–south pedestrian crossing at these high-capacity crossroads.

Project development would affect Mike Jacob Sports Park landscaping and parking along the park frontage but would not affect the continuing function of the park; the Build Alternative would not affect facilities at Ted Walker Park [see Section F, *Section 4(f)*, for additional discussion]. Access to the parks would be maintained during project construction, although reconstruction of the Ina Road TI would make access more circuitous.

⁹ See program website for additional information: <www.rtamobility.com/MainStreet.aspx>.

According to Marana Unified and Tucson Unified school districts, regular bus routes would be affected by TI closures and detours during project construction. ADOT would coordinate with the school districts during development of the transportation management plan during construction so the districts could best plan their routing during construction.

Minor modifications to the existing transit system routes by SunTran would be needed to address the realignment of the Camino de la Cruz intersection and the change in access at Highway Drive and Ruthrauff Road. Improved LOS and removal of roadway/railroad conflicts would contribute to improved traffic operation, which would benefit transit operation.

During construction, all transit routes traversing the construction zone would likely experience some degree of congestion and delay; however, routes on I-10 and Orange Grove Road would be maintained during construction. Reconstruction of Ina Road and Ruthrauff Road TIs would require temporary rerouting of affected routes during construction. ADOT would consult with SunTran so that it could plan future modifications to its routes both during and after construction.

The park-and-ride lot at Ruthrauff Road and I-10 would be eliminated to accommodate the new Ruthrauff Road TI. Because this facility experiences very little use, is not part of the SunTran system, and because another park-and-ride lot is located just east of this one, replacement of this facility is not recommended. The lot is not included in any regional transportation or air quality plan, and has no implications for transit or air quality planning.

3. No Action Alternative

Under the No Action Alternative, no improvements to access or traffic operation would result and LOS would continue to decline as a result of increased traffic and resulting congestion. The at-grade railroad crossing would remain. This would result in continuing traffic delays for local and interstate traffic and emergency responders. There would be no impacts to residences or business resulting from acquisition or access changes as a result of this project, which would be beneficial to these properties in the short-term. Continued congestion is anticipated to be a deterrent for some customers in the long-term.

Except for routine maintenance of the roads and railroad, short-term construction impacts would be avoided.

No modifications would be needed to the transit system; however, the system would also not benefit from improved LOS and would continue to experience delays from railroad traffic and congestions. Impacts to transit during construction would be avoided and the park-and-ride lot at Ruthrauff Road and I-10 would be preserved.

4. Mitigation Measures

Arizona Department of Transportation Design Responsibilities

- Acquisition and relocation would be conducted through an assistance program in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 Code of Federal Regulation § 24), which identifies the process, procedures, and time frame for right-of-way acquisition and relocation of affected residents or businesses.
- To ensure sufficient access to properties during construction, key local access improvements at Ina Road and Ruthrauff Road would be completed prior to reconstruction of the respective traffic interchanges.

- Landscape plans would include areas of available right-of-way along North Camino de la Cruz and Maryvale Avenue to provide a buffer between residential and commercial land uses.
- A transportation management plan would be prepared consistent with the *Manual on Uniform Traffic Control Devices for Streets and Highways* (Federal Highway Administration 2010). In addition, the transportation management plan would have the following requirements:
 - During development of the final design, the Arizona Department of Transportation would coordinate with emergency response and transit providers (Arizona Department of Public Safety, City of Tucson Police Department, Town of Marana Police Department, Pima County Sheriff's Department, Northwest Fire District, Rural/Metro Fire Department, Northwest Medical Center, SunTran, and the Amphitheater, Marana Unified, Flowing Wells, and Tucson Unified school districts) to accommodate emergency and transit needs in the transportation management plan.
 - The plan would account for peak traffic associated with seasonal events (golf tournaments, gem and mineral show, cycling events, etc.).
 - The plan would ensure access to all properties would be provided and maintained during construction.
 - Signs would indicate business access to commercial properties within the construction zone.

Arizona Department of Transportation District Responsibilities

- To ensure sufficient access to properties during construction, key local access improvements at Ina Road and Ruthrauff Road would be completed prior to reconstruction of the respective traffic interchanges.

Contractor Responsibilities

- To ensure sufficient access to properties during construction, key local access improvements at Ina Road and Ruthrauff Road would be completed prior to reconstruction of the respective traffic interchanges.
- The contractor, after coordination with the Engineer, would communicate traffic control measures with the public, local officials, and the media prior to and during construction activities. Communication may include, but is not limited to, media alerts, direct mailings to area businesses and property owners, information on freeway variable message signs, and paid newspaper notices.
- The contractor, after coordination with the Engineer, would provide a construction notice to residents and businesses in the general project area at least 2 weeks prior to construction.
- The contractor, after coordination with the Engineer, would notify the public and business owners of temporary access changes during construction at least 7 calendar days in advance of the change.
- The contractor would contact local emergency services (hospital, fire, and police, including Arizona Department of Public Safety, City of Tucson Police Department, Town of Marana Police Department, Pima County Sheriff's Department, Northwest Fire District, Rural/Metro Fire Department, and Northwest Medical Center) at least 14 calendar days in advance of crossroad, traffic interchange, or frontage road closures so that they could arrange for alternate travel routes.
- The contractor would contact municipal transit providers (public transit and school districts, including SunTran and Amphitheater, Marana Unified, Flowing Wells, and Tucson Unified school districts) at least 14 calendar days in advance of crossroad, traffic interchange, or frontage road closures so that they could notify their riders and arrange for alternate travel routes.

- At least 14 calendar days prior to construction, the contractor would place advance-warning signs at locations designated by the Engineer to notify motorists, pedestrians, and bicyclists of construction-related delays.
- With the exception of temporary, short-term closures of less than 3 hours of driveways, the contractor would maintain driveway access to all businesses and residences throughout construction. If a given property has multiple driveways, at least one would remain open at all times.
- Access to adjacent businesses and residences would be maintained throughout construction.
- The contractor, after coordination with the Engineer, would notify the public a minimum of 48 hours in advance of any road closures.
- The contractor would provide for the adequate protection of all vehicular and pedestrian traffic and workers through any portion of the work where construction operations interfere with, obstruct, or create a hazard to the movement of traffic consistent with the Arizona Department of Transportation’s *Standard Specifications for Road and Bridge Construction*, Section 701, Maintenance and Protection of Traffic, dated 2008.

D. Title VI and Environmental Justice

Under Title VI of the Civil Rights Act of 1964 and related statutes, federal agencies are required to ensure that no person is excluded from participation in, denied benefits of, or subjected to discrimination under any program or activity receiving federal financial assistance on the grounds of race, color, religion, national origin, sex, age, or disability. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to identify and address disproportionately high and adverse effects on minority and low-income populations. Consideration is also given to elderly, disabled, and female-head-of-household populations.

CEQ’s environmental justice guidance defines a minority or low-income population as occurring when either (1) the low-income or minority population of the affected area exceeds 50 percent, or (2) the low-income or minority population percentage of the affected area is meaningfully greater than the low-income or minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997). If the population is dispersed and not an identifiable minority or low-income community (50 percent of the population), then it is not considered a “distinct” group, and there would be no effect on minority or low-income populations.

In addressing environmental justice, it is important to understand whether the proposed action would have disproportionately high and adverse impacts on the sensitive population. Because the proposed project would be federally funded, this section includes a review of demographics within the study area to determine whether disproportionate impacts on protected populations would occur. To establish whether or not environmental impacts would disproportionately affect minority or low-income populations, it is necessary first to establish a basis of comparison. The minority and low-income populations of each block group were compared to the Pima County average for each of the populations.

1. Existing Conditions

To produce the most current demographic information for this analysis, the 2000 Census, 2010 Census, and the American Community Survey 2006–2010 were used. Tables 10 through 13 represent the smallest unit of analysis available for each of the studied populations. For most groups, this was census block group

information, but for poverty data, census tracts were used. Any of these units of analysis may extend beyond the study area; therefore, these areas would not match the population and demographic characteristics of the study area discussed earlier. Figures 12a and 12b represent the census tract and block group boundaries for 2000 and 2010, respectively. The American Community Survey data boundaries are consistent with the 2010 census tracts.

According to Tables 10 through 13 none of the minority groups in the census areas comprise 50 percent of the block group population. None of the minority group population percentages in the block group census areas are substantially higher than the Pima County minority group average populations. There are no statistically “distinct” groups in the project vicinity based on the Census data.

2. Build Alternative

Improvements would not have a disproportionately high and adverse effect, either direct or indirect, upon minority, low-income, elderly, or disabled persons or female heads of households within the study area. This proposed project would benefit all motorists using I-10 from Ina to Ruthrauff Roads, increasing mobility and safety for the traveling public. Improvements would be developed in accordance with Title VI of the Civil Rights Act of 1964, as amended by the Civil Rights Act of 1968 (Title VIII), and they conform to the requirements of the Americans with Disabilities Act of 1990.

The proposed action would not result in adverse effects on Title VI and environmental justice populations, and impacts would not be disproportionately high after comparing the impacts and benefits to all populations in the study area. An analysis of the proposed project demonstrates that benefits such as the improved regional mobility and reduced local arterial street traffic accrue to both environmental justice and non-environmental justice communities. In addition, low-income and minority populations would not be disproportionately affected and would be beneficiaries of the transportation improvements proposed by the project team. Although the project would have socioeconomic impacts such as changes in access and relocations, these impacts do not focus on environmental justice populations. Refer to Section C, *Social and Economic Conditions*, in this part of the EA for additional discussion of proportionate project impacts.

It is expected that all residents of the area would experience short-term impacts such as noise, vibration, dust, and temporary street restrictions and closures during construction. However, these impacts would be no greater than those experienced by non-environmental justice populations who also reside in the project area.

3. No Action Alternative

It is anticipated that socioeconomic characteristic conditions under the No Action Alternative would be similar to the existing conditions. Congestion would increase with the No Action Alternative and accessibility to employment and housing may be impeded by increased congestion. As congestion on surface streets would increase, all communities would be affected equally.

Figure 12a. 2000 census tracts and block groups in the study area

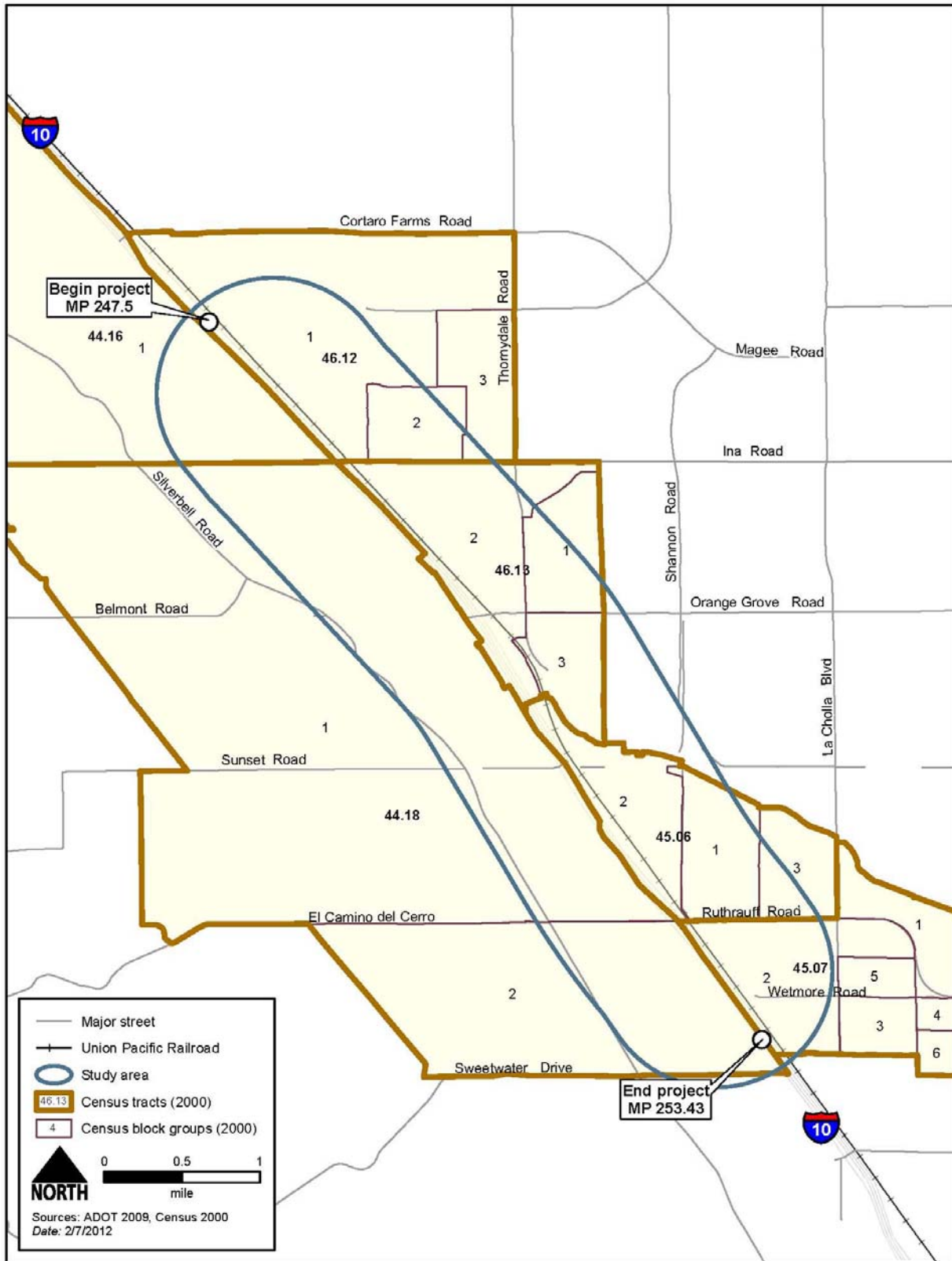


Figure 12b. 2010 census tracts and block groups in the study area

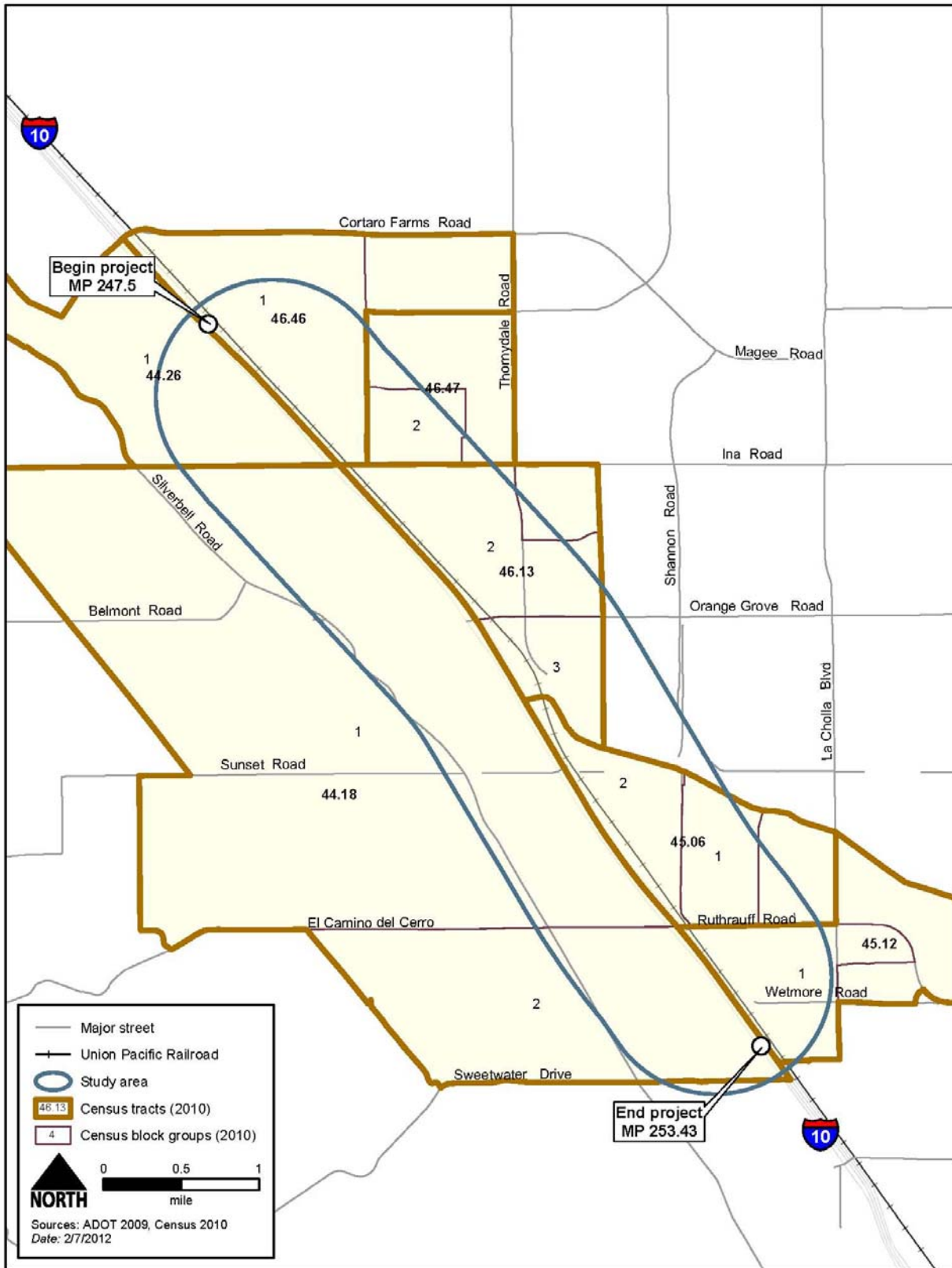


Table 10. 2010 racial and ethnic demographics, expressed in percentages

Census block groups	Total population	White	African American	Native American	Asian	Pacific Islander	Some other race	Two or more races	Hispanic ^a
44.18 BG 1	2,644	88.5	1.2	1.0	4.1	0.3	6.6	1.7	6.9
44.18 BG 2	704	89.9	4.5	1.4	2.7	1.4	5.0	4.1	22.7
44.26 BG1	2,726	82.4	4.2	2.1	8.2	0.6	7.2	4.4	26.9
45.06 BG 1	2,249	84.6	1.3	2.4	0.5	0.2	14.3	3.1	38.1
45.06 BG 2	1,752	73.3	1.5	3.4	0.9	0.3	23.6	2.9	53.2
45.06 BG 3	1,285	78.9	4.7	2.1	4.4	0.2	16.7	6.5	31.5
45.12 BG1	1,565	86.4	3.5	3.6	1.6	0.1	8.6	3.1	28.3
46.13 BG 2	1,686	85.3	3.9	2.8	3.2	0.7	9.0	4.6	31.3
46.13 BG 3	986	87.6	1.6	1.5	2.0	0.0	10.4	3.2	26.4
46.46 BG 1	1,492	86.3	3.2	3.4	2.4	0.9	7.2	3.3	21.4
46.47 BG2	1,228	87.2	3.0	2.3	1.1	0.0	10.5	3.7	27.0
Total tracts	18,317	84.3	2.8	2.4	3.2	0.4	10.8	3.5	28.1
Pima County	980,263	77.5	4.5	4.3	3.6	0.3	13.7	3.7	34.6
Arizona	6,392,017	75.9	5.0	5.5	3.6	0.4	13.2	3.4	29.6

Source: U.S. Census Bureau, 2010 Census, Summary File 1, Tables P4, P8, P9

^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 11. 2010 environmental justice demographics

Census block groups	Total population	Percentage elderly	Number of households	Percentage female head of household ^a
44.18 Block Group 1	2,644	17.9	1,037	25.5
44.18 Block Group 2	704	18.9	195	29.5
44.26 Block Group 1	2,726	8.8	1,054	32.1
45.06 Block Group 1	2,249	11.1	829	41.2
45.06 Block Group 2	1,752	9.1	590	43.1
45.06 Block Group 3	1,285	12.7	469	38.4
45.12 Block Group 1	1,565	21.7	683	47.0
46.13 Block Group 2	1,686	10.8	711	39.0
46.13 Block Group 3	986	19.0	408	42.2
46.46 Block Group 1	1,492	10.5	571	34.2
46.47 Block Group 2	1,228	8.1	440	32.3
Total tracts	18,317	13.0	6,987	37.1
Pima County	980,263	16.1	388,660	39.2
Arizona	6,392,017	14.4	1,380,990	37.3

Source: U.S. Census Bureau, 2010 Census, Summary File 1 Tables P17, P12, P18, P28, P29, P37, P38, and P39

^a Total number generated with the following two subcategories: family households (female householder), and nonfamily households (female householder). Beginning in 1980, the Bureau of the Census discontinued the use of the terms *head of household* and *head of family*.

Table 12. 2000 disabled population

Census block groups	Population ^a	Number disabled	Percentage disabled
44.16 Block Group 1	7,938	898	11.3
44.18 Block Group 1	1,930	253	13.1
44.18 Block Group 2	702	92	13.1
45.06 Block Group 1	2,199	488	22.2
45.06 Block Group 2	1,479	395	26.7
45.07 Block Group 2	1,469	283	19.3
46.12 Block Group 1	4,299	720	16.8
46.13 Block Group 2	166	46	27.7
Total tracts	20,182	3,175	15.7
Pima County	774,006	155,566	20.1
Arizona	4,667,187	902,252	19.3

Source: U.S. Census Bureau, Census 2000, Summary File 3 ^a Total population for whom disabled status is determined.

Table 13. 2006-2010 poverty status based on the American Community Survey^a

Census tracts	Population ^b	Number below poverty level	Percentage below poverty level
44.18	3,647	568	15.6
44.26	2,389	179	7.5
45.06	4,595	1,167	25.4
45.12	3,989	899	22.5
46.13	3,464	184	5.3
46.46	3,531	243	6.9
46.47	4,074	250	6.1
Total tracts	21,897	933,113	13.6
Pima County	940,520	154,259	16.4
Arizona	6,110,304	933,113	15.3

Source: U.S. Census Bureau, 2006-2010 American Community Survey, File S1701.

^a American Community Survey data is aggregated over five years for a given census tract and not available at the block group level.

^b Total population for whom poverty status is determined.

E. Cultural Resources

Cultural resources include archaeological sites; historic districts, buildings, and structures; artifacts and objects; and places of traditional, religious, and cultural significance. A “historic property” refers to cultural resources that are included in or eligible for inclusion in the National Register of Historic Places (NRHP). The National Historic Preservation Act of 1966, as amended (16 United States Code [U.S.C.] 470), requires federal agencies to take into account the effects of their undertakings on historic properties and to afford the State Historic Preservation Officer (SHPO) and other parties with a demonstrated interest a reasonable opportunity to comment on such undertakings. Regulations for Protection of Historic Properties (36 C.F.R. Part 800) implement Section 106 of the National Historic Preservation Act. These regulations define a process for responsible federal agencies to consult with the SHPO or Tribal Historic Preservation Officer, Native American groups, other interested parties, and, when necessary, the Advisory Council on Historic Preservation to ensure that historic properties are duly considered as federal projects are planned and implemented.

To be determined eligible for inclusion in the NRHP, cultural resource properties must be important in American history, architecture, archaeology, engineering, or culture. In addition, properties must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet at least one of four significance criteria:

- Criterion A: be associated with events that have made a significant contribution to the broad patterns of our history
- Criterion B: be associated with the lives of persons significant in our past
- Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant distinguishable entity whose components may lack individual distinction
- Criterion D: have yielded, or may be likely to yield, information important in prehistory or history

Properties may be of local, state, or national importance. Typically, historic properties are at least 50 years old, but younger properties may be considered for inclusion if they are of exceptional significance. In cases where a project would not go to construction for several years from the time of an evaluation, a more recent cutoff date (e.g., 40 or 45 years) may be used so that properties that would reach the 50 year age criterion by the time construction began could be considered. Given the anticipated project schedule, a 40-year cut-off for NRHP evaluations was appropriate. Therefore, cultural resources dating in or prior to 1971 were considered in the analysis.

The area of potential effects (APE) is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if such properties exist [36 C.F.R. Part 800.16(d)].

1. Existing Conditions

Archaeological Resources

A Class I archaeological overview, including a records check, was prepared for the study area. Results of the Class I archaeological overview are reported in *Past Occupation of the Middle Santa Cruz Floodplain: A Class I Overview for the Interstate 10, Ina Rd. to Ruthrauff Rd. TI Project in Marana, Tucson, and Pima County, Arizona* (Lundin 2011).

Class III archaeological surveys were not conducted for the preparation of the EA because prior archaeological investigations in the APE for the Build Alternative have demonstrated that archaeological resources are abundant and that surface expression is not necessarily indicative of the presence of subsurface resources. Thus, standard archaeological pedestrian survey would not have been productive or useful in predicting the extent and distribution of buried archaeological deposits. Archaeological testing would be required to determine the location and condition of subsurface cultural resources within the project area.

The records check revealed that 12 prehistoric archaeological sites and 2 historic linear sites have been documented within the APE. While 9 prehistoric sites are eligible for listing in the NRHP under Criterion D for their potential to contribute significant information regarding prehistoric settlement of the Middle Santa Cruz River floodplain, the eligibilities of 3 prehistoric sites are undetermined. A list of archaeological sites in the APE is provided in Appendix C. The historic linear sites include the Southern Pacific Railroad and old SR 84. The railroad is eligible for listing in the NRHP under Criterion A for its associations with the early development of Arizona's railroad system between 1878 and 1940. Old SR 84 is eligible for listing in the NRHP under Criterion D for its potential to yield important information about the development of Arizona's roadways.

Architectural Resources

An inventory and NRHP eligibility evaluation of the historic built environment were conducted. The results are reported in *Historic Built Environment and National Register of Historic Places Eligibility Assessment for the Interstate 10, Ina Road Traffic Interchange (TI) to Ruthrauff Road TI, Project in Pima County, Arizona* (Blackwell and Barnes 2012). The APE included properties and subdivisions in and adjacent to the footprint of the Build Alternative so that indirect effects, such as changes to visual and auditory settings—characteristics that can sometimes contribute to the NRHP eligibility of historic buildings—could be evaluated. Because construction of the Build Alternative would not take place for several years, a 40-year cutoff was used for the evaluation to allow a buffer for properties that may reach 50 years of age by the time construction commenced.

A total of 84 parcels constructed in or prior to 1971 within the APE were surveyed and evaluated for eligibility for listing in the NRHP. Nine subdivisions in the APE also were evaluated for NRHP eligibility. Lists of the properties and subdivisions evaluated are provided in Appendix C.

All of the 84 surveyed parcels were recommended not eligible for NRHP listing as individual properties, or as contributing properties to a potential historic district. All the subdivisions in the survey were recommended not eligible for NRHP listing as historic districts.

2. Build Alternative

Based on prior archaeological investigations, if the Build Alternative were selected it would be likely, if not certain, that significant archaeological deposits would be affected. Any adverse impacts to archaeological resources determined eligible for listing in the NRHP would likely require mitigation through archaeological excavations and documentation.

Given the unreliability of surface findings as indicators of intact subsurface cultural deposits, it is recommended that a phased testing and/or data recovery plan be prepared and implemented as stipulated in the Programmatic Agreement (PA) developed for the improvements to the I-10 corridor between the Tangerine Road and Interstate 19 TIs. The plan would address the portions of the sites in the APE not previously investigated through archaeological excavations—including the I-10 median, which was excluded from previous subsurface investigations—and for which ground disturbance is proposed.

The Build Alternative would directly affect the segment of old SR 84 north of Ina Road that was determined eligible for listing in the NRHP. The adverse impacts to the highway would require mitigation in accordance with the PA developed for the I-10 corridor and the *Interim Procedures for the Treatment of Historic Roads* (ADOT, et al. 2002) developed by FHWA, ADOT, and SHPO. The Build Alternative would require new ROW from UPRR to construct crossroads over the railroad tracks and thus, the historic alignment at Ina and Ruthrauff Roads, and to provide for access and maintenance of the new crossroad facilities. Because the project would not affect the railroad alignment, or any of the characteristics that convey its historical significance, FHWA determined that this minor acquisition of railroad ROW, and the project in general, would not adversely affect the railroad.

The Build Alternative would not directly or indirectly affect historic buildings or other types of architectural resources determined eligible for listing in the NRHP.

3. No Action Alternative

If the No Action Alternative were selected, there would be no impacts to historic properties. Although the study area has potential for intact archaeological deposits, in the absence of new construction, continued use of existing transportation infrastructure would not affect archaeological resources.

4. Mitigation Measures

Arizona Department of Transportation Design Responsibilities

- During final design, testing and data recovery plans would be developed and implemented by the Arizona Department of Transportation Environmental Planning Group Historic Preservation Team, in consultation with the State Historic Preservation Officer and other consulting parties. The testing and data recovery plan would be developed in accordance with the existing Programmatic Agreement executed for the project. Construction activities would not occur in areas requiring testing and data recovery until the terms and conditions of the Programmatic Agreement have been fulfilled.

Arizona Department of Transportation District Responsibilities

- The Engineer would contact the Arizona Department of Transportation Environmental Planning Group Historic Preservation Team (602-712-7767) to schedule the preconstruction or partnering meeting on a mutually agreeable date to ensure a qualified Team representative would be available to attend the meeting.

Contractor Responsibilities

- If previously unidentified cultural resources are encountered during the proposed undertaking, the contractor shall stop work immediately at that location and shall take all reasonable steps to secure the preservation of those resources. The contractor would call the Arizona Department of Transportation Environmental Planning Group Historic Preservation Team at (602) 712-7767 immediately to make arrangements for the proper treatment of those resources.
- The contractor would not work in any area with previously identified historic properties (archaeological sites, old State Route 84, the railroad), or in any non-site-specific areas where archaeological testing is required, until authorized by the Arizona Department of Transportation Environmental Planning Group Historic Preservation Team.

5. Agency and Tribal Consultations and Determination of Project Effect

Consulting parties for this project include FHWA, U.S. Army Corps of Engineers (Corps), ADOT, Arizona State Museum (ASM), SHPO, Pima County, Town of Marana, City of Tucson, Arizona State Land Department, UPRR, Advisory Council on Historic Preservation, Hopi Tribe, Pascua Yaqui Tribe, San Carlos Apache Nation, Tohono O’odham Nation, Tonto Apache Tribe, and the Yavapai-Prescott Indian Tribe. The Yavapai-Apache Nation and the White Mountain Apache Tribe deferred consideration of the project to the other tribes and requested not to be included in further consultation.

FHWA determined that because the Build Alternative would likely affect archaeological sites and one historic linear site determined eligible for NRHP listing under Criterion D, a finding of “adverse effect” is appropriate for the proposed project. SHPO concurred with FHWA’s determination of project effect in a letter sent to FHWA dated September 28, 2011. In addition, concurring letters were received from ASM, Pima County, Town of Marana, Hopi Tribe, Tohono O’odham Nation, Tonto Apache Tribe, and Yavapai-Prescott Indian Tribe. Furthermore, SHPO concurred with FHWA’s determination that one historic linear site would not be adversely affect by the project in a letter sent to FHWA dated March 2, 2012. In addition, concurring letters were received from Arizona State Land Department, ASM, Pima County, Town of Marana, Hopi Tribe, Tohono O’odham Nation, and Yavapai-Prescott Indian Tribe. SHPO also concurred with FHWA’s recommendation that none of the properties within the APE evaluated in the architectural inventory qualify for inclusion in the NRHP in a letter sent to FHWA dated April 30, 2012. In addition, concurring letters were received from ASLD, Town of Marana, the Hopi Tribe and Yavapai-Prescott Indian Tribe. Pima County did not concur, commenting that the historic context used to evaluate the mixed use, commercial, and industrial properties was not adequate. The consultation period for the architectural inventory is still open and consulted parties may still comment. Consultation with Pima County regarding its comment is ongoing. Copies of the letters are in Appendix C.

F. Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966 stipulates that FHWA may approve a transportation project requiring the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites of significance only if there is no feasible and prudent alternative to the use of that land and the proposed action includes all possible planning to minimize harm to the property resulting from such use (49 U.S.C. § 303).

A “use” of a Section 4(f) resource, as defined as in 23 C.F.R § 774, occurs (1) when land is permanently incorporated into a transportation facility, (2) when there is a temporary occupancy of land that is adverse in terms of the statute’s preservationist purposes, or (3) when there is a constructive use of land. A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from the 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 as a result of an increase in noise levels, restrictions in access, or other impacts that could substantially impair aesthetic features or attributes of the resource.

In August 2005, Section 4(f) was revised under Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for User (Public Law 109-59) to simplify the process and approval of projects with *de minimis* impacts to resources afforded protection under Section 4(f). Under the revised provisions, projects determined to result in a *de minimis* impact are not required to undergo an analysis of avoidance alternatives, and once the project impact is determined to be *de minimis*, the Section 4(f) evaluation process is complete.

An impact to a park or recreation area may be determined by FHWA to be *de minimis* if the transportation use does not adversely affect the activities, features, and attributes that qualify the resource for protection and is supported with the written concurrence of the officials with jurisdiction over the Section 4(f) property. Further, the public must be provided an opportunity to review and comment on the project’s impacts to the park or recreation area. An impact to a historic site may be determined by FHWA to be *de minimis* if the transportation use would have no adverse effect on historic properties under Section 106 of the National Historic Preservation Act and is supported with written concurrence of the SHPO.

1. Existing Conditions

Table 14 identifies the potential resources afforded protection under Section 4(f) within the study area. There are no wildlife and waterfowl refuges within the study area.

2. Build Alternative

Most of the Section 4(f) facilities within the project study area (see Table 14) are outside the project limits and would not be directly affected by the project. Facilities within or adjacent to the project limits are managed by Pima County Natural Resources, Parks, and Recreation and include two parks—Mike Jacob Sports Park and Ted Walker Park—and three trails.

Table 14. Potential resources afforded protection under Section 4(f) in the study area

Facility	Section 4(f) features	Managing agency	Approximate distance and direction from project limits
Within or adjacent to project limits			
Mike Jacobs Sports Park	Ball fields, playground	Pima County NRPR ^a	Adjacent at eastbound frontage road
Ted Walker Park (currently closed)	Soccer field, playground	Pima County NRPR	Adjacent at eastbound frontage road
Cañada del Oro Wash Park/Trail	Trails	Pima County NRPR	Crosses under I-10 ^b ; along wash
ROMP ^c Trail	Trail	Pima County NRPR	Distance varies; west of eastbound frontage road; segments within and outside Arizona Department of Transportation right-of-way
Rillito Creek Park/Trail	Trails	Pima County NRPR	Crosses under I-10; along wash
AZ Z:2:40 (ASM)/Southern Pacific Railroad Main Line – Southern Route, Sunset Route	Historic railroad	State Historic Preservation Office	East of westbound frontage road; crosses crossroads
Within study area and outside project limits			
Richardson Park	Ball fields, ramadas	Pima County NRPR	1 mile east
Richardson Elementary School	Ball fields, playground	Flowing Wells SD ^d	1 mile east
Robert Hendricks Elementary School	Ball fields, courts, playground	Flowing Wells SD	0.5 mile east
Wildwood Neighborhood Park	Ball fields, tennis courts, ramadas	Pima County NRPR	1 mile east
Meadowbrook Neighborhood Park	Ball fields, playground, ramadas	Pima County NRPR	1 mile east
Pegler/Dan Felix Recreation Area	Ball fields	Pima County NRPR	0.5 mile east
Flowing Wells Park	Ball fields, ball courts, playground	Pima County NRPR	0.7 mile east
Laguna School	Ball fields, ball courts, playground	Flowing Wells SD	270 feet east
Flowing Wells Junior High School	Ball fields, ball courts, track	Flowing Wells SD	0.5 mile southeast
Christopher Columbus/Silverbell Regional Park	Ball fields, lake, playground, trails, ramadas	Pima County NRPR	500 feet west
Sweetwater Wetlands	Trails, wildlife viewing areas	City of Tucson Water Department	0.5 mile southwest

^a Natural Resources, Parks and Recreation ^b Interstate 10 ^c Regional Optimization Master Plan ^d School District

The Build Alternative would require approximately 1.6 acre of ROW from the frontage of Mike Jacob Sports Park, resulting in a “use” of approximately 3 percent of the park, including the loss of 15 percent of the existing parking spaces and landscaping along the ROW. The active recreation areas are set back from I-10 and its eastbound frontage road and would not be affected by the project. ADOT would coordinate with Pima County to replace lost parking areas and landscaping on-site, as well as maintain access to the park during construction. The proposed project would not adversely affect the activities, features, or attributes that qualify the resource for protection under Section 4(f). Impacts on Mike Jacob Sports Park would be *de minimis*. Construction of the project would have no direct impacts on Ted Walker Park, and would not result in “use” of the resource.

The Regional Optimization Master Plan (ROMP) trail predominantly follows a pipeline access road that has been modified to become a recreational trail. Segments of the trail are located within existing ADOT ROW. The project would not have permanent effects on the trail; however, construction activities may require temporary closure of trail segments within ADOT ROW for the safety of trail users. The primary designation of ADOT ROW is for a transportation facility; therefore, those trail segments within ADOT ROW are not afforded protection under Section 4(f) and no “use” of resources afforded protection under Section 4(f) would occur.

Cañada del Oro Wash Park/Trail and Rillito Creek Park/Trail are linear parks that follow the Cañada del Oro Wash and Rillito Creek, respectively, and cross under I-10. Within the project limits, the Cañada del Oro Wash Park/Trail does not have any developed trail features, while the Rillito Creek Park/Trail has a paved trail above the southern bank. During construction, these trails may be detoured within the washes. In addition, some construction activities (i.e., bridge demolition) may require short-term closures or trail detours outside the washes for the safety of trail users. Any negative effects to trail features during construction would be addressed and the trails would be returned to preconstruction conditions. The Build Alternative would not inhibit future development of trail improvement by Pima County. Because effects to these trails would be temporary and any negatively affected trail features would be returned to preconstruction conditions, the Build Alternative would not result in “use” of trail resources afforded protection under Section 4(f).

Potential impacts on these facilities were discussed in a meeting with Pima County in October 2010, and were presented during a public meeting on March 10, 2011; no public comments on this subject were received as a result of the public meeting. Impacts that would result from the Build Alternative were evaluated in an FHWA letter report (FHWA 2011a); Pima County concurred with the evaluation on July 28, 2011 (see correspondence in Appendix B).

AZ Z:2:40 (ASM) is a historic railroad determined eligible for listing in the NRHP under Criterion A for its association with the early development of Arizona’s railroad system. UPRR currently operates this site as a modern railroad, and the site is devoid of historic features so that the alignment of the railroad is the key attribute within the project area contributing to its eligibility.

The project would construct crossroads over the UPRR ROW and, thus, over the historic alignment at Ina and Ruthrauff Roads. At Ina Road, bridge piers would be constructed within the UPRR ROW but would span the railroad tracks. At Ruthrauff Road, bridge abutment footings would encroach into the UPRR ROW but would not affect the railroad tracks. A total of 0.94 acre of new ROW would be needed from UPRR—0.85 acre for Ina Road and 0.09 acre for Ruthrauff Road for construction of, access to, and maintenance of the new crossroad facilities. Because the project would not affect the railroad alignment, FHWA determined that this is a minor acquisition of railroad ROW and the project would result in no adverse effect to the historic property under Section 106. Because the project would have no adverse effect to the historic property, Section 4(f) impacts to the historic site would be *de minimis*. SHPO concurred with the Section 106 and *de minimis* findings on March 2, 2012.

3. No Action Alternative

Under the No Action Alternative, there would be no temporary or permanent impacts on Section 4(f) recreation resources.

4. Mitigation Measures

Arizona Department of Transportation Design Responsibilities

- During final design, the Arizona Department of Transportation would coordinate with Pima County to replace lost parking on-site at Mike Jacobs Sports Park, reconstruct the driveway entrance to the parking lot, and replace the affected landscaping.

Contractor Responsibilities

- The contractor would maintain access to Mike Jacob Sports Park during construction.
- The contractor would maintain trail access during construction. Advance notice would be posted for trail users if any temporary trail closures were required.
- Any trail features negatively affected during construction would be returned to preconstruction conditions.

G. Air Quality

The Clean Air Act of 1970 required that the U.S. Environmental Protection Agency (EPA) establish National Ambient Air Quality Standards (NAAQS), which defined the maximum allowable concentrations for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), sulfur dioxide (SO₂), and lead (see Table 15). Amendments to the Act in 1977 and 1990 authorized EPA to designate areas not meeting the NAAQS as being in nonattainment and to classify the severity of the nonattainment.

The EPA is required to periodically review the NAAQS and modify them, as necessary. The EPA recently modified the NAAQS for ozone (O₃) based on new studies that showed a lower level was needed to protect public health. The EPA also regulates air toxics. Most air toxics originate from human-made sources, including vehicles, airplanes, dry-cleaning equipment, factories, and refineries.

Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. MSATs consist of 21 compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to 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 21 MSATs, a subset of seven compounds has been designated by the EPA as the priority MSATs. These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel particulate emissions), formaldehyde, naphthalene, and polycyclic organic matter (POM).

The EPA is the lead federal agency for administering the CAA 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. According to an FHWA analysis using the EPA MOBILE 6.2 model, even if vehicle activity (vehicle miles traveled) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSATs is projected from 1999 to 2050.

Table 15. National ambient air quality standards

Pollutant	Averaging time	Primary standard	Secondary standard
Carbon monoxide (CO)	1-hour	35 ppm ^a	No standard
	8-hour	9 ppm	No standard
Nitrogen dioxide (NO ₂)	1-hour	0.100 ppm	No standard
	Annual	0.053 ppm	0.053 ppm
Ozone (O ₃)	1-hour	0.12 ppm	0.12 ppm
	8-hour	0.075 ppm	0.075 ppm
Particulate matter (PM ₁₀)	24-hour	150 µg/m ³ ^b	150 µg/m ³
Fine particulate matter (PM _{2.5})	24-hour	35 µg/m ³	35 µg/m ³
	Annual	15 µg/m ³	15 µg/m ³
Sulfur dioxide (SO ₂)	1-hour	0.075 ppm	No standard
	3-hour	No standard	0.5 ppm
	24-hour	0.14 ppm	No standard
	Annual	0.03 ppm	No standard
Lead	Rolling 3-month average	0.15 µg/m ³	0.15 µg/m ³

Source: 40 Code of Federal Regulations § 50

Note: The 1-hour standard for ozone listed here was phased out in June 2005, but is still applicable to previously-designated nonattainment areas.

^a parts per million ^b micrograms per cubic meter

In 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. As a result of this rule, new passenger vehicles would emit 45 percent less benzene, gas cans would emit 78% less benzene, and gasoline would have 38 percent less benzene overall. The hydrocarbon reductions from the vehicle and gas can standards would reduce volatile organic compound emissions (which are precursors to ozone and can be precursors to PM_{2.5}) by more than 1 million tons in 2030.

Particulate matter refers to solid or liquid particles suspended in the air that may be composed of acids, organic chemicals, metals, or soil and dust particles. Particle sizes range from those large enough to be seen as smoke or haze to those so small that they act as a gas and are visible only through an electron microscope. Those particles with diameters less than 2.5 microns are denoted as PM_{2.5}, and sources include fuel combustion, power plants, and diesel vehicles. Those particles with diameters of 10 microns or less are denoted as PM₁₀, and sources include fugitive dust from unstable or disturbed dirt surfaces, vehicle travel on unpaved roads, crushing and grinding operations, and open burning.

1. Existing Conditions

The Tucson area is in attainment for all NAAQS pollutants, with a Limited Maintenance Plan for CO. In addition, a small portion of the study area is within the Rillito PM₁₀ nonattainment area. The Limited Maintenance Plan includes measures to ensure that Tucson continues to meet CO standards for attainment. Under the terms of the plan, project-specific conformity determinations are still required, although that may be accomplished with a qualitative evaluation for CO depending on project operating conditions. For this project, because several intersections operate at LOS D, E, or F conditions currently and in the future, a quantitative CO analysis was conducted as part of this evaluation.

The Rillito PM₁₀ nonattainment area was designated because in the past the area did not meet federal health-based standards for PM₁₀. Nonattainment status was attributed to nearby agricultural areas, emissions from Arizona Portland Cement, and fugitive dust emissions from vehicular traffic. Since designation, the region has experienced significant growth, yet managed to attain the PM₁₀ NAAQS.

The Pima County Department of Environmental Quality maintains a network of air monitoring sites throughout the Tucson air planning area. Table 16 presents the monitoring sites nearest to the study area, the pollutant being monitored, and the 2010 air quality data.

The concentrations of all pollutants monitored by the Pima County Department of Environmental Quality in 2010 at the 3 sites were below the NAAQS.

Results of the project-level analysis predict maximum 1-hour CO concentrations for the existing conditions, including the background concentration, ranging from 2.4 parts per million (ppm) to 5.1 ppm. Applying the EPA-recommended persistence factor results in predicted 8-hour CO concentrations of 1.7 ppm to 3.6 ppm for existing conditions. These predicted concentrations are well below the NAAQS (ADOT 2011a).

Table 16. 2010 air quality data in the project vicinity

Monitoring site	Pollutant	Averaging time	Highest recorded concentration
Orange Grove 3401 W. Orange Grove Road	Particulate matter (PM ₁₀)	24-hour	64 µg/m ³ ^a
	Fine particulate matter (PM _{2.5})	24-hour	15.7 µg/m ³
		Annual	5.16 µg/m ³
Coachline 9597 N. Coachline Boulevard	Ozone (O ₃)	8-hour	0.063 ppm ^{b, c}
	PM _{2.5}	24-hour	18.0 µg/m ³
		Annual	5.12 µg/m ³
Children's Park 400 W. River Road	Carbon monoxide (CO)	1-hour	1.2 ppm
		8-hour	0.8 ppm
	O ₃	8-hour	0.066 ppm ^c
	PM _{2.5}	24-hour	13.5 µg/m ³
		Annual	5.02 µg/m ³
	Nitrogen dioxide (NO ₂)	1-hour	0.045 ppm
Annual		0.010 ppm	

Source: Pima County Department of Environmental Quality 2011

^a micrograms per cubic meter ^b parts per million

^c Value reported is the fourth highest concentration, consistent with the National Ambient Air Quality Standards.

2. Build Alternative

An air quality hot-spot analysis is an estimation of the likely future localized pollutant concentrations and a comparison of those concentrations with the relevant air quality standards. The focus is usually the immediate area around a proposed project, as opposed to the regional focus of an emissions inventory for an entire nonattainment area. Hot-spot analyses may be either quantitative, in which future concentrations are calculated for specific locations in the study area, or qualitative, in which the proposed project and study area are compared with similar existing facilities, existing monitoring data, and other readily available information.

An evaluation of MSATs is required for all projects. Based on the projected future traffic volumes for the project, a Level 3 MSAT evaluation was conducted. The project area was modeled for MSAT concentrations to compare the air quality effects of the No Action Alternative and Build Alternative conditions for the design year (2040) and interim year (2015) with existing conditions (ADOT 2011a).

The project-level analysis predicted maximum 1-hour CO concentrations for the Build Alternative, including the background concentration, ranging from 2.3 ppm to 3.7 ppm for the interim year (2015) and 2.3 ppm to 4 ppm for the future year (2040). Applying the EPA-recommended persistence factor resulted in predicted 8-hour CO concentrations of 1.6 ppm to 2.6 ppm for the interim year and 1.6 ppm to 2.8 ppm for the future year. These predicted concentrations are well below the NAAQS (ADOT 2011a).

Under the Build Alternative, the MSAT analysis showed that between the existing and interim years (2015), the VMT would increase approximately 21 percent, while all eight priority MSAT pollutants would decrease by 4 percent to 38 percent. Further, between the interim (2015) and future years (2040), the VMT would increase by approximately 36 percent, while five of the eight priority MSAT pollutants would decrease by up to 64 percent, and the remaining three priority MSAT pollutants would increase by up to 7 percent. Over the entire analysis period, between the existing (2010) and future years (2040), the VMT would increase by approximately 65 percent, while concentrations of five of the eight priority MSAT pollutants would decrease by up to 78 percent, and the remaining three priority MSAT pollutants would increase slightly, up to 3 percent.

Therefore, the results of the evaluation demonstrated that the proposed project would not likely cause new violations of the NAAQS or contribute to the severity or number of existing violations of the NAAQS.

Additionally, some short-term deterioration in air quality could be experienced during construction of the project due to the operation of construction equipment and the slower traffic speeds associated with a construction zone. However, this would be a localized condition—largely concentrated at the construction zone—that would discontinue upon completion of construction. Mitigation measures would be implemented to control fugitive dust generated from construction activities.

Air Quality Conformity

The Clean Air Act requires that the Build Alternative conform to the adopted RTP and 5-year TIP. The Build Alternative reflects the improvements included in the current RTP (updated in 2012). In addition, the project-specific air quality analysis demonstrates the project is not likely to cause or contribute to the severity or number of violations of the NAAQS.

Phase I and II improvements are included in the 5-year 2012–2016 TIP. Phase III and IV improvements would occur beyond the 5-year program. As a result, the fiscally constrained programs for these years have yet to be developed and adopted by PAG. Phases listed in the outer years of the RTP that have not been included in the adopted TIP would be reevaluated for conformity with the TIP prior to final design of these phases.

Since this project extends 1 mile into the Rillito PM₁₀ nonattainment area, a project level analysis would be performed prior to completion of final design to demonstrate conformity.

The park-and-ride lot at Ruthrauff Road and I-10 would be eliminated to accommodate the new Ruthrauff Road TI (also see discussion in Section C, *Social and Economic Considerations*). This facility is not part of the existing SunTran system and is not included in the regional air quality plan. Because this facility experiences little use and another park-and-ride lot is located nearby, loss of this facility is not anticipated to have implications for air quality conformity.

3. No Action Alternative

Results of the project-level analysis predict maximum 1-hour CO concentrations for the No Action Alternative, including the background concentration, ranging from 2.3 ppm to 4.2 ppm for the interim year (2015) and 2.3 ppm to 4.2 ppm for the future year (2040). Applying the EPA-recommended persistence factor results in predicted 8-hour CO concentrations of 1.6 ppm to 2.9 ppm for the interim year and 1.6 ppm to 2.9 ppm for the future year. These predicted concentrations are well below the NAAQS (ADOT 2011a).

Under the No Action Alternative, the MSAT analysis shows that between the existing and interim years, the VMT would increase approximately 21 percent, while all eight priority MSAT pollutants would decrease by 3 percent to 38 percent. Further, between the interim and future years, the VMT would increase by approximately 35 percent, while four of the eight priority MSAT pollutants would decrease by up to 64 percent, and the remaining four priority MSAT pollutants would increase by up to 10 percent. Over the entire analysis period, between the existing and future years, the VMT would increase by approximately 64 percent, while concentrations of five of the eight priority MSAT pollutants would decrease by up to 78 percent, and the remaining three priority MSAT pollutants would increase by up to 6 percent.

Comparisons between the No Action Alternative and the Build Alternative for both the interim and future years show very little difference between emissions of the eight MSAT pollutants. For the interim year, the VMT would increase less than 0.5 percent with the Build Alternative, while the changes in priority MSAT emissions range from an increase of less than 0.5 percent to a decrease of just over 1 percent. For the future year, the VMT would increase less than 1 percent with the Build Alternative, while the changes in priority MSAT emissions range from an increase of just over 1 percent to a decrease of nearly 3.5 percent.

4. Mitigation Measures

Under the Build Alternative, overall air quality would be improved as a result of enhanced vehicle efficiency. Monitoring of CO concentrations would continue to confirm attainment with the NAAQS. No mitigation measures would be warranted. However, temporary impacts to air quality as a result of construction activities would require mitigation. Consistent with ADOT's *Standard Specifications for Road and Bridge Construction*, Section 104.08 (2008), the following standard specifications would apply.

Arizona Department of Transportation Design Responsibilities

- Prior to completion of final design, a project-level PM₁₀ analysis would be conducted to confirm project conformity with the Rillito PM₁₀ nonattainment area.

Contractor Responsibilities

- The contractor would control, reduce, remove, or prevent air pollution in all its forms, including air contaminants, in the performance of the contractor's work.
- The contractor would comply with the applicable requirements of Arizona Revised Statutes Section 49-401 et seq. (Air Quality) and with the Arizona Administrative Code, Title 18, Chapter 2 (Air Pollution Control).

H. Noise Levels

Title 23 C.F.R. § 772 requires that a traffic noise analysis be conducted for proposed federal-aid highway projects that will construct a highway on a new location or substantially alter an existing highway. A traffic noise study was conducted for this project pursuant to ADOT's 2005 Noise Abatement Policy (NAP), with an addendum dated August 2007, and in accordance with FHWA's noise abatement criteria (NAC) outlined in *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (FHWA 1995).

FHWA's Traffic Noise Model 2.5 was used to predict the existing noise environment and the noise environment for the design year (2040) for the No Action and Build Alternative conditions. Peak-hour traffic data obtained from the traffic report for this project (ADOT 2010a) were used in building the model for each condition. The noise analysis methods and results are presented in detail in the traffic noise report prepared for this project and are summarized in this section (ADOT 2011b).

The FHWA NAC delineate noise-sensitive areas by land use categories and the noise levels in A-weighted decibels (dBA)¹⁰ at which noise abatement should be considered. Abatement should be considered when noise levels "approach" or exceed the NAC or when future noise levels substantially increase over existing levels.

The FHWA NAC allow individual states and local governments to define the level at which traffic noise "approaches" the NAC, and at which point design year (2040) traffic noise levels "substantially increase" over existing traffic noise levels. ADOT's NAP defines "approach" as within 3 dBA of the NAC (i.e., noise levels of 64 dBA or higher for category B land uses will be considered for abatement; see Table 17). Additionally, ADOT's NAP states that mitigation measures will be considered for noise-sensitive properties if the predicted design year traffic noise levels substantially increase over existing levels (defined as a 15-dBA increase).

¹⁰ dBA is the measurement of sound that most closely approximates the sensitivity of the human ear

Table 17. Federal Highway Administration noise abatement criteria

Land use category	NAC ^a (dBA L _{eq})	Description of land use category
A	57 (exterior)	Land on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, RV parks, day care centers, and hospitals
C	72 (exterior)	Developed land, properties, or activities not included in Categories A and B above
D	Not applicable	Undeveloped land
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Source: 23 Code of Federal Regulations § 773

^a noise abatement criteria

1. Existing Conditions

Using Traffic Noise Model 2.5, existing traffic noise levels were predicted to range from 56 dBA L_{eq1h}¹¹ to 73 dBA L_{eq1h} at 24 receivers. According to Table 18, noise levels at 12 receiver locations exceed ADOT’s NAP threshold for the 2010 existing conditions (ADOT 2011b). Noise monitoring was conducted in March 2010 during peak a.m. and p.m. traffic hours; see Figure 13 for locations.

2. Build Alternative

Noise abatement measures must be feasible, reasonable, and desired by the affected individuals. Feasibility considers whether it is structurally and acoustically possible to provide the noise abatement (i.e., whether the topography allows a barrier to be built and whether a substantial noise reduction would be achieved). To be considered acoustically feasible, the noise barrier would provide at least a 5-dBA noise reduction and reduce noise levels at or below the appropriate approach threshold for the land use category. An analysis of feasibility also takes into account drainage issues, safety considerations, maintenance requirements, and whether or not other noise sources are present in the area. Reasonability means that ADOT believes mitigation measures are prudent, based on consideration of the following conditions:

- The cost of the noise abatement shall not exceed \$46,000 per benefited developed property.¹²
- The noise barrier would generally benefit more than one sensitive property.

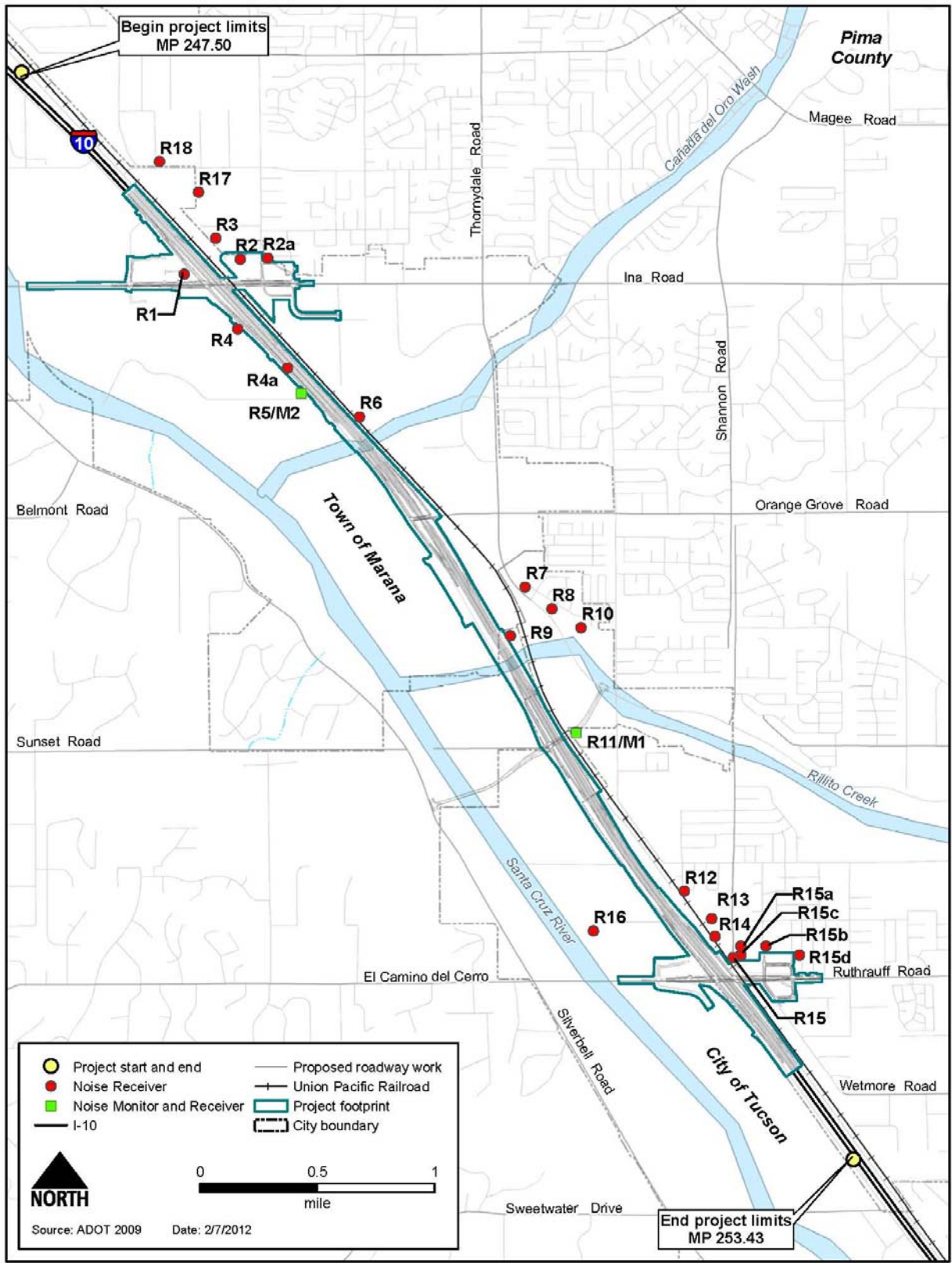
Under ADOT’s NAP, noise barriers meeting feasibility and reasonability criteria would be constructed unless the majority of the affected residents are opposed to their construction.

Twenty-four sensitive receivers were evaluated from a traffic noise perspective. Figure 13 shows the receiver locations. All of the receivers represent category B land uses as described in Table 18.

¹¹ L_{eq1h} is the L_{eq} for 1 hour.

¹² The maximum cost of abatement was amended in the *Noise Abatement Policy Addendum*, August 2007. For this project, the cost of abatement was calculated using \$33 per square foot of barrier.

Figure 13. Receiver and monitoring locations



Project design year (2040) traffic noise levels were predicted at each receiver location for the No Action Alternative and the Build Alternative conditions. For the Build Alternative, preliminary engineering drawings were used for the proposed roadway alignment. Table 18 presents the noise prediction results for the No Action and Build Alternatives and the properties associated with each receiver.

Under the Build Alternative, Ina, Sunset, and Ruthrauff Roads would be grade-separated with UPRR. As a result, trains would not need to sound their horns at these locations. Peak-hour traffic noise levels were predicted to range from 59 to 77 dBA by 2040 (ADOT 2011b). Several properties within the study area would be expected to experience a 1- to 5-dBA reduction in noise levels from existing levels because of the proposed changes in the roadway elevations. The remaining properties would be expected to experience a 0- to 6-dBA increase in noise levels over existing levels. Peak-hour traffic noise levels under the Build Alternative would exceed ADOT’s NAP threshold at 19 receiver locations; however, not all of the receivers meeting the noise threshold criteria qualify for abatement. Receivers 1 and 2 represent hotels, which are not considered for traffic noise mitigation because they are commercial properties that typically prefer visibility from the roadway. Receiver 5 represents Ted Walker Park; however, the location of the receiver did not represent what would be a noise-sensitive area of the park. Receivers 6, 9, and 16 represent the trails at the Cañada del Oro Wash, Rillito Creek, and Santa Cruz River. These areas were not considered for noise abatement because most users would be passing through the area on the trail rather than staying in the area for prolonged periods of time. Receiver 17 is located outside of the project limits.

Five noise barriers were evaluated for effectiveness in reducing traffic noise levels below 64 dBA and in providing a 5-dBA noise reduction at the remaining 12 traffic noise-affected receivers (receivers 2a, 3, 4, 4a, 11, 12, 13, 14, 15, 15c, 15d, and 18). Based on ADOT’s noise abatement criteria, no noise barriers are recommended (see Table 18 for a summary by receiver).

Table 18. Noise analysis summary

Receiver ID	Receiver description	Number of sensitive properties	Existing noise level	2040 noise level ^a		Comments
				No Action Alternative ^a	Build Alternative, unmitigated ^a	
1	Travel Lodge hotel	1	72	75	76	Motels not considered for mitigation
2	Motel 6 (pool)	1	66	69	65	Motels not considered for mitigation
2a	4575 W. Calle Marco	1	59	62	65	Barriers 1-1 and 1-2 Not reasonable or feasible
3	4646 W. Mars Street	3	67	70	69	Barriers 1-1 and 1-2 Not reasonable
4	Mike Jacobs Sports Park	1	73	75	76	Barriers 2-1 and 2-2 Not feasible
4a	Mike Jacobs Sports Park Expansion	1	75	78	77	Barrier 5 for Sports Park Expansion Not feasible
5	Ted Walker Park	1	72	75	76	Not a noise-sensitive area of the park

(continued on next page)

Table 18. Noise analysis summary (continued)

Receiver ID	Receiver description	Number of sensitive properties	Existing noise level	2040 noise level ^a		Comments
6	Cañada del Oro Wash	1	68	71	72	Not a noise-sensitive area
7	3674 W. Courtney Crossing Lane	4	58	61	62	None – below NAP ^b
8	3590 W. Courtney Crossing Lane	20	57	59	61	None – below NAP
9	Rillito Wash	1	66	69	73	Not a noise-sensitive area
10	6010 Applesauce Court	5	56	58	59	None – below NAP
11	3426 W. Tres Nogales Rd	3	66	69	66	Barrier 3 Not feasible
12	3044 W. Emerald Circle	4	69	72	73	Barriers 4-1 and 4-2 Not feasible
13	Laguna Elementary School	1	68	71	71	Barriers 4-1 and 4-2 Not feasible
14	Mobile home park	4	70	73	70	Barriers 4-1 and 4-2 Not feasible
15	4868 N. Shannon Road	8	70	73	66	Barriers 4-1 and 4-2 Not feasible
15a	4933 N. Shannon Road	1	64	66	63	None – below NAP
15b	4933 N. Davis Avenue	1	62	64	62	None – below NAP
15c	4917 N. Shannon Road	1	70	73	65	Barriers 4-1 and 4-2 Not feasible
15d	4980 N. Maryvale Road	1	65	67	66	Barriers 4-1 and 4-2 Not feasible
16	Santa Cruz Wash	1	62	65	65	Not a noise-sensitive area
17	4906 W. Massingale Road	3	61	64	67	None – outside of project limits
18	Residence near North Camino de Oeste	5	63	67	67	Barriers 1-1 and 1-2 Not reasonable

Source: ADOT 2011b

^a in dBA L_{Aeq1h} (the 1-hour equivalent loudness in A-weighted decibels, which is the logarithmic average of noise over a 1-hour period)

^b Noise Abatement Policy

3. No Action Alternative

Under the No Action Alternative, peak-hour traffic noise levels were predicted to range from 58 to 78 dBA at the receivers (ADOT 2011b). By 2040, evaluated properties within the project area would be expected to experience a 2- to 4-dBA increase in traffic noise levels over existing levels. Peak-hour traffic noise levels under the No Action Alternative would exceed ADOT's NAP threshold at 20 receiver locations. The No Action Alternative would generally result in lower noise levels than the Build Alternative because traffic would be farther away and at a lower elevation compared with the Build Alternative. However, at 10 of the receiver locations, the No Action Alternative would result in higher noise levels than the Build Alternative because of the increase in traffic along the crossroads and frontage roads near the receivers. Refer to Table 18 for traffic noise levels under the No Action Alternative.

4. Mitigation Measures

Arizona Department of Transportation Design Responsibilities

- During final design, the Arizona Department of Transportation project manager would arrange for qualified personnel to review and update the noise analysis.

Standard Specifications as Mitigation

Consistent with the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 104.08 (2008), the following standard specifications would apply:

- The contractor would comply with all local sound control and noise level rules, regulations, and ordinances that apply to any work performed pursuant to the contract.
- Each internal combustion engine used for any purpose on the work or related to the work would be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine would be operated on the work without its muffler being in good working condition.

5. Summary

Under the No Action Alternative, evaluated properties within the study area would experience a 2- to 4-dBA increase in traffic noise levels by 2040. Traffic noise levels would exceed ADOT's threshold for noise abatement consideration at 20 receivers; however, because the No Action condition would not result in construction of the proposed roadway, no traffic noise mitigation measures would be warranted.

Under the Build Alternative, evaluated properties within the study area would experience a 0- to 6-dBA increase in traffic noise levels by 2040. Several properties would experience a 1- to 5-dBA reduction in noise levels from existing levels. Traffic noise levels would exceed ADOT's threshold for noise abatement consideration at 19 receivers; however, the five noise barriers evaluated as mitigation were unable to achieve the noise reduction goal and are not reasonable and/or feasible to construct.

Temporary noise impacts would be experienced by noise-sensitive properties during construction of the project. ADOT's *Standard Specifications for Road and Bridge Construction* includes noise control measures that would be implemented during construction to minimize noise impacts.

I. Utilities and Railroads

1. Existing Conditions

During frontage road construction, a joint utility trench was established adjacent to the outside of each frontage road and hosts equipment from a number of providers, as well as ADOT electric lines. Utilities are also located adjacent or crossing I-10 both within and outside ADOT ROW, along the railroad ROW, and along crossroads and local roads.

Utility facilities and providers within the study area include communications (AT&T, Level 3, MCI, Xspedius, Time Warner, CenturyLink, ADOT), water (Tucson Water), sanitary sewer and wastewater treatment (Pima County Regional Wastewater Reclamation Department [PCRWRD]), petroleum (Kinder-Morgan Energy), electric (Tucson Electric Power, ADOT), gas (Southwest Gas), and storm drain (Pima County Flood Control, ADOT). See Section K, *Water Resources*, for a discussion of wells. Utility providers have an obligation to maintain the security of their systems and facilities under U.S. Department of Homeland Security requirements and may have specific perimeter requirements to safeguard equipment, supplies, or facilities.

PCRWRD operates two wastewater treatment facilities east of I-10: the Roger Road Water Reclamation facility south of El Camino del Cerro and the Ina Road Water Reclamation facility south of Ina Road. These facilities treat wastewater prior to its discharge into the Santa Cruz River. As part of the ROMP, PCRWRD is in the process of modernizing and expanding its facilities. PCRWRD recently installed an interconnect pipe adjacent to the eastbound frontage road to manage effluent loads between the two facilities. Following treatment, most of the reclaimed water is discharged to the Santa Cruz River, some water is provided to the City of Tucson, and some is used for recharge.

UPRR has ROW roughly parallel and east of I-10, and operates one track with switches at Ina Road and Ruthrauff Road, with a second track authorized and under construction. Ultimately, the ROW is intended to accommodate up to four tracks. At-grade road railroad crossings are located at Ina, Ruthrauff, and Joiner Roads.¹³ With the opening of a second rail line in the near future, train traffic volumes are expected to double, increasing vehicle wait times for at-grade crossings. Currently, Sunset Road does not cross the railroad, but an extension of the road to the east is planned by Pima County and the RTA.

2. Build Alternative

Most of the existing storm drains associated with I-10 would be lengthened or replaced to accommodate the new freeway width and profile and, therefore, would encroach on existing utilities, including those associated with the joint utility trench.

Construction of bridge foundations, abutments, and retaining walls may conflict with utilities that parallel Ina and Ruthrauff Roads and may require relocation. The bridge abutment at Ina Road may encroach on Kinder Morgan petroleum lines in the UPRR ROW and require relocation of petroleum lines. Retaining wall construction may also encroach on Kinder Morgan petroleum lines at Ina, Sunset, and Ruthrauff Roads. The extent of impact would depend on the type and placement of walls constructed. For example, mechanically stabilized earth walls have a relatively small footing and over excavation area, in comparison to cast-in-place

¹³ Joiner Road is a local road south of Orange Grove Road that connects River Road and commercial land uses located between the eastbound frontage road and the railroad ROW.

walls, which require a much larger footing and over excavation area. Design of bridge foundations, abutments, and retaining walls is preliminary and specific design, sizing, and construction methods would be determined during final design. Where feasible and cost-effective, ADOT would select an approach and methods that would minimize conflicts with utilities.

ADOT has closely coordinated with PCRWRD to exchange information on planned improvements (also see Table 22, in Part V, Section A, *Agency Scoping*). The Build Alternative would require additional ROW from the PCRWRD property along Ina Road, which would affect frontage amenities (see Table 9, in Section C, *Social and Economic Considerations*). Project implementation would not affect PCRWRD's operations, the new interconnect pipe, or implementation of the ROMP.

Construction would result in temporary impacts to UPRR operations during construction. Construction of crossroads over the UPRR ROW at Ina, Sunset, and Ruthrauff Roads would eliminate conflicts with vehicles, allow UPRR to operate unrestricted at these locations, and ease any future expansion by UPRR in these areas.

3. No Action Alternative

The No Action Alternative would not result in any utility impacts, conflicts, or relocations. At-grade road crossings with the railroad would remain at Ina and Ruthrauff Roads and constrain any future expansion of UPRR.

4. Mitigation Measures

Arizona Department of Transportation Design Responsibilities

- During final design, the Arizona Department of Transportation would coordinate relocation of utilities with the affected utility companies. If service disruption would be needed for relocation, the Arizona Department of Transportation would coordinate with the utility companies to ensure customers are notified prior to service disruption.
- The Arizona Department of Transportation would provide Union Pacific Railroad with an opportunity to review and comment on the design plans.

Contractor Responsibilities

- In conjunction with the utility provider, the contractor would notify members of the public and business owners of temporary utility service interruptions during construction at least 7 calendar days in advance of the interruption of service.
- The contractor would establish emergency response procedures in the case of accidental utility disruptions.

J. Visual Resources

This section describes the characteristics of the viewshed in the study area, including the level of development, drainage features, vegetation, and topography and potential impacts on visual resources.

1. Existing Conditions

The topography is gently sloping to the northwest and is crossed by the Cañada del Oro Wash and Rillito Creek, which are dominant visual features crossing the study area. Other dominant visual features within the study area include the I-10 freeway, major crossroads, railroad tracks, commercial properties, residential neighborhoods, municipal facilities (landfill, wastewater treatment plant), and a sand and gravel operation with large excavation pits. The Santa Catalina Mountains to the east, Tucson Mountains to the southwest, and, to a lesser extent, the Tortolita Mountains to the north, are visually prominent from I-10 and major crossroads, but less visible from local roads and adjacent commercial and residential areas. Views along and west of I-10 are generally more expansive, and views east of I-10 are less expansive and more dominated by urban development. Freeway landscaping is installed within the ADOT ROW, while landscaping is generally lacking along crossroad ROW, except for the Ina Road median east of I-10. Overhead transmission and service lines are adjacent to the eastbound and westbound frontage roads, along crossroads, and throughout the study area. Street lighting is located along I-10 and at TIs, but is limited along crossroads and local streets. Additional lighting is associated with commercial properties.

Foreground views from I-10 are dominated by the interstate features including adjacent freeway landscaping, frontage roads, and earthen to vegetated median. Middle ground views are of the adjacent land uses, dominated on the east by the railroad ROW, commercial businesses and residences, and overhead transmission lines, and dominated on the west by disturbed vacant land, sand and gravel pits, and park and municipal facilities. Background views include the features of the foreground and middle ground views as well as the mountains references above.

Foreground views from Ina and Ruthrauff Roads are dominated by the roadway, overhead transmission lines, and adjacent land uses including commercial businesses, municipal facilities, and disturbed vacant land. Middle ground views include the foreground views, large tree canopies and the I-10 bridges over the crossroads. Background views encompass foreground and middle ground views and the surrounding mountains.

Foreground views from Orange Grove Road are dominated by retaining walls and the UPRR bridge near the TI, commercial development east of the UPRR ROW, and sand and gravel operations to the west. To the east, middle ground views include the sand and gravel operations and to the west are dominated by commercial land use. Background views are obscured where Orange Grove Road is depressed, but include the Tucson and the Santa Catalina Mountains at a distance from the TI.

Foreground views from residential areas are dominated by local roads, facing and adjacent residences, and features of the neighborhood (transmission lines, mailboxes, etc.). Middle ground views encompass foreground views and tree canopies. Background views are dominated by foreground and middle ground views with little or no views of surrounding mountains.

2. Build Alternative

Foreground views from I-10 would continue to be dominated by features of the interstate, but would feature more developed area as a result of the conversion of the median and shoulders into travel and auxiliary lanes.

Due to the predominance of developed features, landscaping opportunities are expected to be limited. Middle and background views from I-10 would be the same or similar to existing conditions, except at the Ina, Sunset, and Ruthrauff Road TIs. At these locations, foreground, middle, and background views would be dominated by the new TI features including the crossroad bridges and exit and frontage road ramps.

Architectural treatments would beautify the I-10 corridor, make it less monotonous, give it a distinctive identity, and maintain continuity using similar architectural treatments, color, and plant materials. The specific treatments to be applied would be determined during the final design process in conjunction with public input, but may include form liner-created patterns for concrete structures, metal fabrications applied to structures, integral or painted color surfaces, landform graphics, other decorative materials, and decorative lighting. Proposed treatments that would be considered include the treatment of retaining walls, bridge barriers and piers, sidewalk barriers, decorative railing, pedestrian fencing, and ROW.

Foreground views from Ina and Ruthrauff Roads at the TIs would be elevated and would be dominated by the roadway and bridge features (railing, fencing). At distance from the TI, views would be similar to current conditions. Middle ground views would include the foreground views and large tree canopies. Background views would encompass foreground and middle ground views and the surrounding mountains. Views from Orange Grove Road would be similar or the same.

Properties adjacent to the crossroads or frontage roads nearest to the TIs would experience the most visual changes because they would face full or partial views of one or more retaining walls instead of roadway. Because frontage roads and crossroads would be elevated closest to the TIs, visibility of adjacent properties would be reduced. Also see discussion of direct impacts to businesses in Section C, *Social and Economic Considerations* (page 39). Because of the increase in height of the TI structures, I-10 features would be visible over a greater distance along the crossroads, but would appear as a gradual climb in elevation along the roadway length when approaching the TI.

Local roads would experience little to no change in elevation, except the local road connections to the crossroads—at the Ina Road and Camino de la Cruz and at the Ruthrauff Road and Maryvale Avenue-Parkway Drive intersections—where there may be a small increase in elevation. Views from residential land use on local streets tend to be interior or neighborhood-oriented, so that the new retaining walls and TI elevations would create a negligible visual change in these areas. Views from commercial properties on local streets tend to be street-oriented, so that the foreground views would not be affected; retaining walls and other TI features may be visible in middle and background views depending on property orientation and proximity.

New local roads would change foreground and middle ground views nearest to new or realigned roads, but would not appreciably change background views.

3. No Action Alternative

The No Action Alternative would not result in any visual changes.

4. Mitigation Measures

Arizona Department of Transportation Design Responsibilities

- The Arizona Department of Transportation would incorporate architectural and landscape treatments into the final design of structures, including retaining walls. Treatment designs would be evaluated and developed with consideration of community input.

K. Water Resources

This section addresses the Safe Drinking Water Act, applicable sections of the Clean Water Act of 1970 (CWA), the Arizona Pollutant Discharge Elimination System (AZPDES), and requirements primarily concerned with water quality.

1. Existing Conditions

Under Section 1424(e) of the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) designated the Upper Santa Cruz and Avra Valley Basin, which underlies the study area, as a sole source aquifer. This designation means that the area has an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health.

As a result of this designation, proposed federal financially-assisted projects which have the potential to contaminate the designated sole source aquifer are subject to EPA review. Under the Memorandum of Understanding (MOU) between EPA and FHWA dated November 2002, any proposed project that is within a designated sole source aquifer and which is subject to analysis through an EA, is subject to a Section 1424(e) review by EPA.

Depths to groundwater in the study area vary depending on land surface elevations. Based on well data from the U.S. Geological Survey and the Arizona Department of Water Resources (ADWR), the depth to groundwater varies from approximately 85 feet below ground surface (bgs) to 170 feet bgs. However, geotechnical test borings performed for the proposed project showed that perched groundwater is located near the Ruthrauff Road TI at a depth of 58 feet bgs (approximately 2,189 feet above mean sea level).

The El Camino del Cerro Water Quality Assurance Revolving Fund site is an existing groundwater contamination plume crossing the study area in the vicinity of Sunset Road. The Arizona Department of Environmental Quality (ADEQ) is responsible for monitoring and remediating groundwater and soil contamination associated with the site, and a number of monitoring wells are associated with site. For more information on this site, see Section O, *Hazardous Materials*.

A review of the ADWR well registry database identifies 96 wells potentially within the project limits (see Figure 14) (ADWR 2012). Well locations in the ADWR database are based on registry forms that request location at a level representing approximately 10 acres. However, location information is often provided by registrants at only the section level, representing about 1 square mile. More precise well locations would be determined in conjunction with final design and the ROW acquisition process. Of those wells registered, 55 are used for water monitoring; 19 are used for water production for domestic, industrial, and municipal uses; 4 are used for geotechnical purposes, 2 are used for groundwater exploration, and 8 are abandoned. Eight wells have no use identified. Records for production wells were further reviewed and evaluated, as summarized in Table 19. According to Table 19, 6 production wells are abandoned, and 3 wells are outside

the project limits. An additional production well not identified in the ADWR database is located south of Ina Road at Starcommerce Road.

A drywell is a bored, drilled, or driven shaft or hole whose depth is greater than its width and is constructed to provide for stormwater disposal. Two dry wells are registered with ADEQ within project limits: at Pacific Pride Fuel south of Ruthrauff Road and on private land adjacent to Ina Road (ADEQ 2012). In addition, an unregistered drywell was identified at the Weber Group (ADOT 2011f).

Table 19. Arizona Department of Water Resources registered production wells

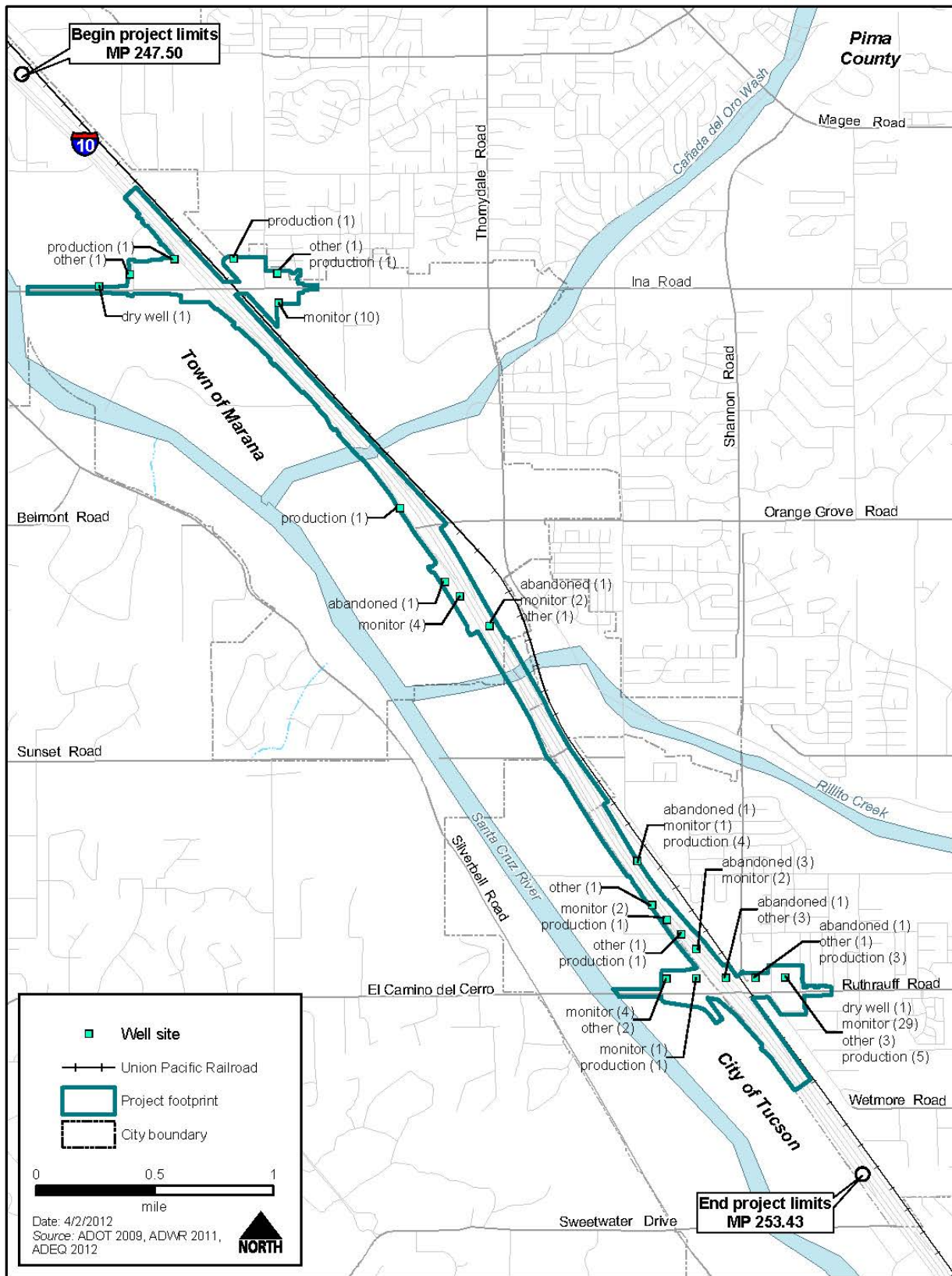
ADWR ^a No.	Use	Depth (feet) ^b	Registered owner	Location ^c	Comments
634179	Domestic	0	ADOT ^d	4870 N. Casa Grande Highway	Frontage road or other project construction may have destroyed well
628418	Domestic	190	Frank H. Gilbert	2840 Ruthrauff Road; Gilbert Pump	Within project limits
639461	Industrial	190	Frank H. Gilbert	2840 Ruthrauff Road; Gilbert Pump	Within project limits
640346	Domestic	200	Merle G. Thompson, Marge F. Thomas	4868 N. Shannon Road	Outside project limits
574532	Domestic	139	Quik Mart Stores, Inc.	2680 W. Ruthrauff Road; Sisson Plumbing	Adjacent to project limits; abandoned in 2008
574533	Domestic	139	Quik Mart Stores, Inc.	2729 W. Ruthrauff Road; Vroman's Auto Body	Within project limits; abandoned in 2008
574534	Domestic	140	Quik Mart Stores, Inc.	4810 N. Maryvale Avenue	Adjacent to project limits; abandoned in 2008
594113	Domestic	175	Quik Mart Stores, Inc.	2756 W. Ruthrauff Road; Ruthrauff RV	Within project limits; abandoned in 2008
619840	Municipal	301	City of Tucson Water Department	4861 N. Maryvale Avenue	Outside project limits
603976	Industrial	200	ADOT	ADOT right-of-way	Abandoned in 2002
638815	Domestic	210	ADOT	Unknown	—
505049	Domestic	0	Kenneth D. Allen	Unknown	—
508611	Domestic	250	ADOT	In ADOT right-of-way	Abandoned in 2001
639098	Domestic	117	Kenneth D. Allen	Unknown	—
803972	Domestic	0	C. J. Barlow, S. A. Barlow, Cowtown Boots, R. Miller	Unknown	—
625466	Industrial	0	Tucson Ready-Mix, Inc.	Northwest of the Orange Grove Road traffic interchange	Adjacent to project limits
619849	Municipal	527	City of Tucson Water Department	North of Ina Road and east of Camino de La Cruz	Adjacent to project limits
635011	Domestic	310	Exxon Company, U.S.A.	Unknown	—
085600	Domestic	193	Marvin Z. Uphaus	4735 W. Mars Street	Outside project limits

Source: ADWR 2012

^a Arizona Department of Water Resources ^b Depth as reflected in ADWR records, including depth of O.

^c Best location that could be inferred based on available ADWR records. ^d Arizona Department of Transportation

Figure 14. Registered wells



PCRWRD operates two wastewater treatment facilities west of I-10 (see Section I, *Utilities and Railroads*).

The Santa Cruz River, Cañada del Oro Wash, and Rillito Creek are major washes that are waters of the United States (Waters) and are subject to Corps jurisdiction under the CWA. The Cañada del Oro Wash originates from the Santa Catalina Mountains and flows southwest, crossing the study area approximately 0.8 mile southeast of Ina Road and reaching the Santa Cruz River approximately 0.5 mile west of I-10. The Rillito Wash flows west through the Tucson metropolitan area along the foothills of the Santa Catalina Mountains, crossing the study area approximately 2 miles south of Ina Road and reaching the Santa Cruz River approximately 0.5 mile west of I-10. The washes have been modified along portions of their channels to support adjacent development. These segments have bank protection. Portions of the Cañada del Oro Wash and Rillito Creek within ADOT ROW are underlain by sand, and have soil cement along the banks and across the wash channel bottom to provide scour protection for ADOT structures. Elsewhere, the channel bottom is earthen, with the top layer being loose sand and extending 15 to 30 feet bgs.

2. Safe Drinking Water Act

Section 1424(e) of the Safe Drinking Water Act of 1974 requires that projects within a sole source aquifer be designed in such a manner as to not create a significant hazard to public health, interfere with public welfare, or cause any public water system to install additional treatment facilities to meet the National Primary Drinking Water Regulations.

Build Alternative

The wells within the study area represent a potential conduit for pollutants to reach groundwater, and they must be safeguarded during project construction activities. Active wells need to be safeguarded so the project does not affect well activities (monitoring, production, etc.).

The project is expected to directly affect wells within project limits, such as production or abandoned wells associated with properties proposed for acquisition (i.e., Gilbert Pump, Vroman's Auto Body; see Table 8 in Section C, *Social and Economic Considerations*). Two water production wells (Ina Road at Starcommerce Road; north of Ina Road and east of Camino de la Cruz) would be avoided by the project (also see Table 24 in Part V, *Public Involvement and Project Coordination*). Wells that conflict with proposed improvements would either be properly abandoned or replaced, consistent with ADWR requirements. Wells would be protected during project construction through a variety of measures identified during final design, such as: new well slabs and annular seals, well site grading to reduce stormwater draining toward the well, and on- and off-site erosion control measures and erosion control plans for the immediate area surrounding the well site.

To establish compliance with Section 1424(e) of the Safe Drinking Water Act, a letter describing the project area and scope, anticipated involvement of groundwater during construction, and methods to protect groundwater resources during construction was sent to the EPA's Groundwater Office (FHWA 2011b). In response, EPA indicated that it would not appear that the Build Alternative would adversely affect the Upper Santa Cruz and Avra Basin aquifer (see correspondence in Appendix B).

No Action Alternative

No impacts to the sole source aquifer would result from the No Action Alternative.

3. Clean Water Act and Arizona Pollutant Discharge Elimination System

Section 404 of the CWA establishes a permitting program regulating activities resulting in the discharge of dredge or fill materials into Waters. The program is jointly sanctioned by the Corps and EPA, although the permit is administered by the Corps.

Under Section 401(a), ADEQ issues certification of federal permits and provides permit conditions that confirm the draft permit is in compliance with effluent limits, Arizona's water quality standards, and any other appropriate requirements of state law.

EPA has authorized ADEQ to operate the National Pollutant Discharge Elimination System and satisfy the requirements of Section 402 of the CWA at the state level. ADEQ implements the AZPDES permit program, regulating activities on non-tribal lands resulting in the discharge of pollutants into Waters. For most construction projects the program is regulated through the Construction General Permit (CGP). To satisfy Section 402 requirements, operators¹⁴ file a Notice of Intent for coverage under the CGP with ADEQ and prepare and implement a Stormwater Pollution Prevent Plan (SWPPP) to prevent erosion and the discharge of pollutants during construction. After construction is complete and the site is stabilized, operators file a Notice of Termination with ADEQ indicating that coverage under the CGP is no longer needed.

Municipal separate storm sewer systems (MS4s) convey stormwater runoff through drains, streets, and open channels, directly discharging untreated stormwater into retention basins, washes, rivers, or lakes. Municipalities operating MS4s within local urbanized areas designated by EPA or ADEQ are required to obtain individual discharge permits under AZPDES authority. ADOT, Tucson, Pima County, and Marana are MS4s and implement individual permits within the study area.

ADOT's MS4 permit authorizes the discharge of stormwater and other discharges to Waters for three elements:

- Activities associated with the MS4 operated by ADOT.

ADOT is implementing a Statewide Stormwater Management Program to address operation of its MS4 facilities (i.e., culverts, outfalls); it includes best management practices (BMPs) development and implementation and monitoring of outfalls following storms.

- Activities associated with construction—from the commencement of construction activities until final stabilization—that are initiated and controlled by ADOT.

Construction project activities are addressed similar to the CGP with implementation of a SWPPP and filing of Notices of Intent and Notices of Termination with ADOT, as well as the other MS4s having jurisdiction; however, ADOT has specific guidance for erosion control plans and SWPPPs.

- Facilities associated with industrial and maintenance activities owned and operated by ADOT (ADEQ 2008).

No ADOT maintenance or industrial facilities have been identified within the study area.

Tucson, Pima County, and Marana have similar MS4 permits specific to their facilities and operations.

¹⁴ The operator is the party with control over the construction site; for ADOT-administered projects, the operator usually includes ADOT and the construction contractors.

Build Alternative

Under the Build Alternative, the bridges over the Cañada del Oro Wash and Rillito Creek would be replaced to widen the roadway and increase the clearance over 100-year storm flows. Piers for the existing structures would be abandoned, and new piers would be installed. Because of the presence of soil cement along the channel bottom, impacts to Waters would be limited. Storm drains on both Ina Road and El Camino del Cerro discharge into the Santa Cruz River and may need to be replaced with larger pipes to accommodate increased capacity (see Section L, *Drainage and Floodplains*). Replacement would involve a temporary disturbance of the soil cement on the eastern bank of the Santa Cruz River. Currently, no channel bottom changes are anticipated, but this would be confirmed during final design. Activities within Waters would be expected to require a nationwide permit from the Corps under Section 404 of the CWA and water quality certification from ADEQ under Section 401(a). Should the floodplain manager or drainage engineer determine that erosion protection features are needed at the channel bottom, resulting in 0.10 acre or greater disturbance to Waters, ADOT would be required to notify the Corps prior to using the nationwide permit. If activities exceed 0.5 acre, an individual permit would be required. Project-related activities would be minimized and no work would occur within Waters until the appropriate Section 404 permit had been obtained from the Corps with Section 401(a) water quality certification provided by ADEQ.

Construction activities such as clearing, grading, trenching, and excavating would disturb soils and sediment. If not managed properly, disturbed soils and sediments can easily be washed into nearby water bodies during storms, where water quality is reduced. A Notice of Intent would be filed with ADEQ and MS4s (ADOT, Pima County, Tucson, Marana) to request coverage under the CGP. To control construction-related pollutant discharges to Waters, ADOT would prepare and implement erosion and sediment control plans, details, and specifications using BMPs from the ADOT *Erosion and Pollution Control Manual for Highway Design and Construction* (ADOT 2005b) and the ADOT *Post-Construction Best Management Practices Manual for Highway Design and Construction* (ADOT 2009a), for inclusion in the SWPPP.

Bridge pier construction may involve a slurry fill process that stabilizes the shaft during concrete installation. The slurry contains a polymer and water and is placed into the shaft to hold the shape of the boring. Concrete is then poured beneath the slurry cap, which displaces the slurry upward where it is recovered by being pumped out and cycled through vats. The slurry may be reused at the next shaft, and at the end of the process, bleach is added to neutralize the polymer. Consistent with ADOT *Standard Specifications* Section 609-3.04(A), the chlorinated water would be disposed of at an ADOT-approved liquid waste disposal facility. Note that slurry from borings in locations and depths that would intercept contamination would not be reused.

Highway runoff can result in nonpoint source pollution of receiving surface water and groundwater. The proposed I-10 main line bridges would minimize sediment and pollutants flowing into the washes from the bridges by collecting stormwater generated on the bridges and directing it to stormwater retention basins for sediment removal prior to discharge. See Section L, *Drainage and Floodplains*, for more information regarding the proposed drainage structures and project-related impacts to surface water elevations.

ADOT has closely coordinated with PCRWRD, and the proposed project would not affect the continuing operation or any planned expansion of PCRWRD facilities (also see Table 24 in Part V, *Public Involvement and Project Coordination*).

The project would adhere to the measures described in all applicable permits.

No Action Alternative

Under the No Action Alternative, activities affecting Waters would be limited to routine maintenance, scour protection improvements, and ADOT's continued implementation of its Statewide Stormwater Management Plan.

4. Mitigation

Arizona Department of Transportation Design Responsibilities

- The Arizona Department of Transportation would prepare and submit an application to the U.S. Army Corps of Engineers for a Clean Water Act Section 404 permit for the project. No work would occur within waters of the United States until the appropriate Clean Water Act Section 401 certification and Section 404 permit are obtained.
- The Arizona Department of Transportation would design drainage so that all runoff from the completed bridges would be captured and routed to a catch basin for settling prior to discharge, consistent with the Arizona Department of Transportation's *Erosion and Pollution Control Manual for Highway Design and Construction* and *Post-Construction Best Management Practices Manual for Highway Design and Construction*.

Arizona Department of Transportation District Responsibilities

- Prior to construction, the Engineer would have the contractor review the attached "Environmental Protection on Arizona Department of Transportation Projects Instructions to Contractors" and review and sign the attached "Checklist for Environmental Compliance." The Engineer would also sign the checklist and submit it to the Arizona Department of Transportation Environmental Planning Group 7 calendar days prior to construction.
- No work would occur within waters of the United States until the appropriate Clean Water Act Section 401 certification and Section 404 permit are obtained.
- The Arizona Department of Transportation would ensure that a Stormwater Pollution Prevention Plan meeting the requirements of the current Arizona Pollutant Discharge Elimination System General Permit for Discharge from Construction Activities to Waters of the United States issued by the Arizona Department of Environmental Quality is prepared and approved for the project.
- The Engineer would submit the contractors' Arizona Pollutant Discharge Elimination System Notice of Intent and Notice of Termination to the Environmental Coordinator.
- The District would review and approve the Section 404 permit and Section 401 certification applications prior to submittal.

Contractor Responsibilities

- Prior to construction, the contractor would review the attached "Environmental Protection on Arizona Department of Transportation Projects Instructions to Contractors" and review and sign the attached "Checklist for Environmental Compliance." The Engineer would also sign the checklist and submit it to the Arizona Department of Transportation Environmental Planning Group 7 calendar days prior to construction.

- No work would occur within waters of the United States until the appropriate Clean Water Act Section 404 permit and Section 401 certification are obtained.
- The contractor would comply with all terms and conditions of the Clean Water Act Section 401(a) Water Quality Certification certified by the Arizona Department of Environmental Quality.
- The contractor would comply with all terms, general conditions, and special conditions of the Clean Water Act Section 404 permit as established by the U.S. Army Corps of Engineers.
- The contractor would develop a containment plan for debris and construction materials to avoid contamination of the Cañada del Oro Wash and Rillito Creek. The containment plan would be approved by the Arizona Department of Transportation Engineer prior to construction.
- The contractor would use the Arizona Department of Transportation’s project erosion and sediment control plans, details, and specifications as a guide in developing a project Stormwater Pollution Prevention Plan. Best management practices set forth in the project erosion and sediment control plans, details, and specifications would be included in the contractor’s Stormwater Pollution Prevention Plan.
- The contractor, in association with the District, would submit the Arizona Pollutant Discharge Elimination System Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality only after the District has reviewed and approved the Stormwater Pollution Prevention Plan.
- The project is located within a designated municipal separate storm sewer system. Therefore, the contractor, in association with the District, would send a copy of the certificate authorizing permit coverage and a copy of the Notice of Termination acknowledgement letter to the Arizona Department of Transportation Office of Environmental Services Water Quality Group, Pima County, City of Tucson, and Town of Marana as appropriate based on the location of project activities.
- Best management practices would be used during construction to protect water resources. These include:
 - Lubricants, fuels, and oils would be stored and dispensed away from the washes.
 - Any disturbance to the washes would be minimized and, once the piers are in place, the remainder of the work would occur outside the washes.
 - Gravel and riprap would be obtained from approved sources.
 - Catchment silt fencing, fiber rolls, or concrete barriers would be used to prevent debris, waste, and toxic compounds from entering the washes.
 - Construction equipment would be inspected daily for leaks or fluid discharges.
 - All maintenance yards would be located outside the washes.
 - All construction equipment maintenance and storage would occur outside of the washes.
 - No concrete dumping or equipment cleaning would occur in or near the washes.
 - Soils that are removed from the earthen bottom portions of washes would be labeled and stockpiled outside the channel until construction activities are completed. Then the soils removed from the wash would be placed back into the areas from where they were removed.
 - Any upland soils that are removed would be moved farther upland to prevent erosion into the washes.

- Any discharges would be handled in accordance with state and federal regulations.

L. Drainage and Floodplains

This section discusses drainage and floodplain issues, including drainage patterns and surface water. Surface water includes water present above the soil surface such as rivers, streams, lakes, pools, and stormwater runoff. Water quality and groundwater associated with the sole source aquifer were discussed in the previous section.

Executive Order 11988, Floodplain Management (1977), requires that impacts on floodplains be evaluated for all federal actions and directs agencies to reduce impacts to floodplains, minimize flood risks on human safety and well being, and restore and preserve floodplain values. National Flood Insurance Program Regulations (44 C.F.R. § 65.12) require compliance with community floodplain ordinances. 23 C.F.R. § 650–subpart A establishes FHWA “policies and procedures for the location and hydraulic design of highway encroachments on floodplains.”

Floodplains are delineated and managed by the Federal Emergency Management Agency (FEMA) and the local floodplain administrator. A floodplain is generally level land subject to periodic flooding from an adjacent body of water.

A 100-year flood is a storm having a 1 percent chance of being exceeded in magnitude in any given year, with a 100-year floodplain including areas that are inundated by water during a 100-year flood. The floodway is the area within the floodplain where water is likely to be the deepest and fastest; this area should be kept free of obstructions to allow 100-year floodwaters to move downstream without increasing the water surface elevation more than 1 foot. FEMA Flood Insurance Rate Map panels depict the delineated 100-year floodplains, which are divided into flood zones including:

- Zone A: flood inundation areas where no base flood elevations have been determined
- Zone AE: flood inundation areas where base flood elevations have been determined
- Zone AH: flood inundation areas with depths between 1 and 3 feet deep (usually ponding)
- Zone AO: flood inundation areas of 1 to 3 feet (usually sheet flow on sloping terrain)
- Zone X: (shaded) areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood areas (unshaded) determined to be outside the 500-year floodplain

1. Floodplains

Existing Conditions

The FEMA Flood Insurance Rate Map panels covering the study area include 04019C1655L, 04019C1660L, 04019C1666L and 04019C1667L—all revised June 16, 2011. A hydraulic and floodplain evaluation was included in the *Preliminary Bridge Hydraulics Report* (ADOT 2011c) and the relevant findings are summarized here. Although the hydraulics report predates the latest map revisions, the revised maps still support the indicated FEMA designations in the report. The study identified the channels of the Rillito Creek and Cañada del Oro Wash as FEMA-designated floodways within zone AE (see Figure 15). I-10 has existing bridges across both of these washes. Soil cement banks along each wash contain the 100-year flood. During a

100-year flood, there would be approximately 4.7 feet between the water surface elevation and the bottom of the bridge at the Cañada del Oro Wash, and 0.4 feet at the Rillito Creek (ADOT 2011c).

Build Alternative

New I-10 main line bridges at the Rillito Creek and Cañada del Oro Wash would be constructed to accommodate road widening and profile changes. When introducing bridge piers into a floodway, the primary consideration is an increase in upstream water surface elevations, as water reaches the piers and the surface elevation may rise upstream of the bridge. The design of the new bridges would be similar to the frontage road bridges already in place, and the new piers would be aligned with existing ones to minimize debris loading and friction losses upstream of bridges. Water surface elevation modeling indicates that no upstream increases in water surface elevations would occur with pier construction.

The Cañada del Oro Wash modeling indicates the water surface elevation would decrease by 0.27 feet with installation of the new bridge. At the Rillito Creek, modeling indicates the water surface elevation would decrease 0.14 feet at the upstream side of the bridge, but increase by 0.55 feet at the downstream end of the bridge. Review of the FEMA model indicates that a lower elevation is being used than is actual for the soil cement bottom at the downstream end of the bridge, resulting in a higher modeled water surface elevation than would actually result from the project. Irrespective, the channel would sufficiently contain the 100-year flow, and the improvements would not adversely affect floodplain elevations.

The new bridges would have a greater distance between the water surface elevation and the bottom of the bridge during a 100-year flood. At the Cañada del Oro Wash, the new distance would be 6.51 feet, an increase of 1.86 feet; at the Rillito Creek, the distance would be 1.45 feet, an increase of 1.05 feet (ADOT 2011c). The hydraulic report also evaluated the potential impacts on I-10 structures during the 100-year flood resulting from Santa Cruz River flood water rise, with the result that impacts from the Santa Cruz were negligible (ADOT 2011c).

No Action Alternative

Under the No Action Alternative, no new structures would be introduced within floodplains, and the existing I-10 main line bridge structures would remain in place.

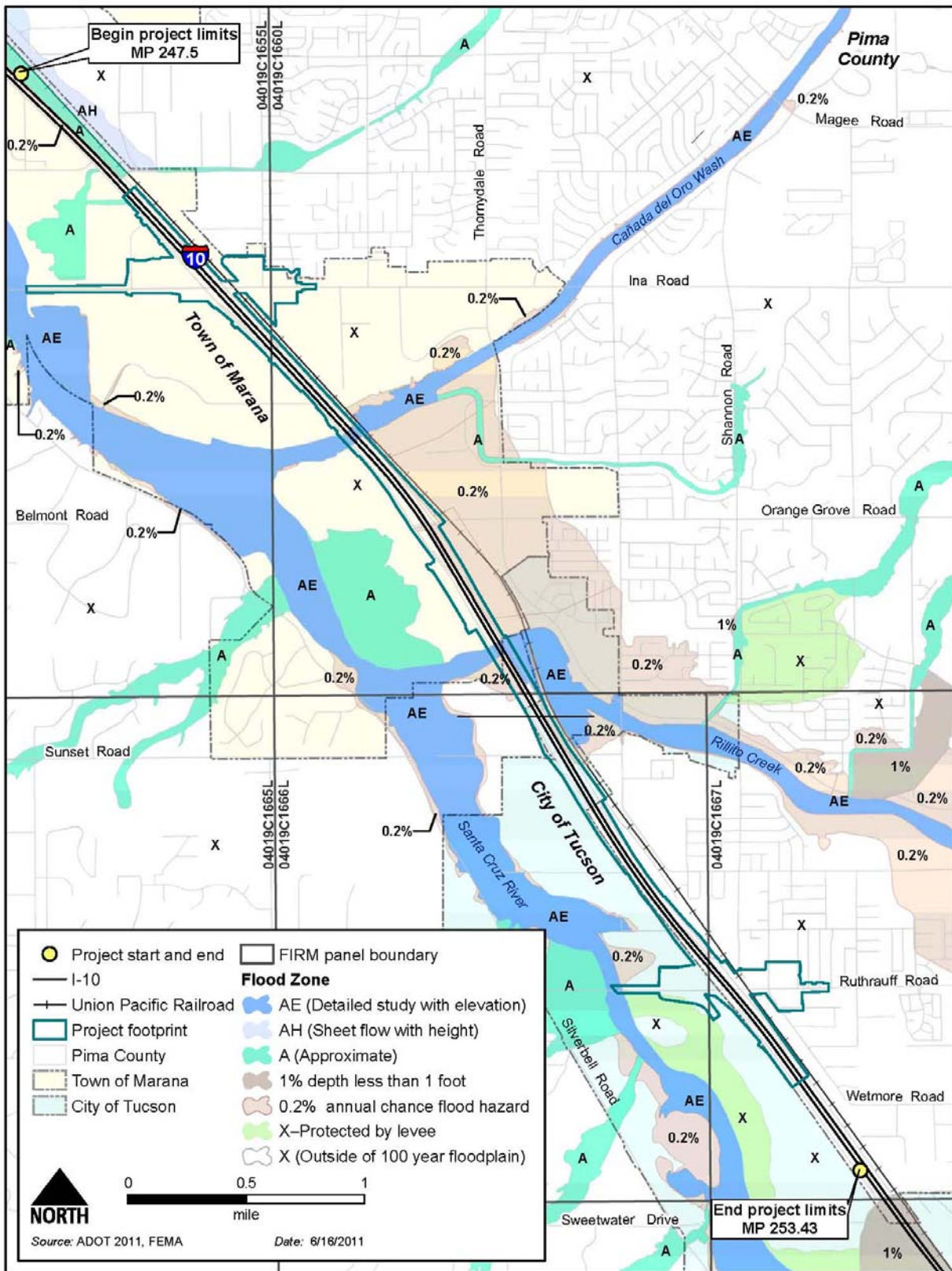
2. Drainage

Existing Conditions

The study area is at the northern end of the Tucson basin, a structural depression within the Basin and Range physiographic province. The Tucson basin is a broad, 1,000-square-mile area in the upper Santa Cruz River drainage basin, with the basin filled with sediments. The dominant drainage features in the study area are the Santa Cruz River, parallel and west of I-10, and its tributaries—the Cañada del Oro Wash and the Rillito Creek.

The study area also features numerous medium-sized to smaller drainages. Railroad tracks east of I-10 act as a drainage barrier, collecting drainage upstream and conveying it into culverts under the railroads. Cross drainage is similarly conveyed under I-10 through culverts.

Figure 15. Federal Emergency Management Agency floodplains



Storm drains are installed on I-10 and Ina, Ruthrauff, and Orange Grove Roads, as well as some of the local streets to capture runoff. A number of cross-drainage improvements were implemented in conjunction with previous frontage road improvements. Local runoff moves through a combination of storm drains, culverts, swales, and surface flow, depending on location. Existing drainage features are further detailed in the *Preliminary Drainage Report* (ADOT 2011d).

Build Alternative

Most of the cross drainage improvements that would be needed for the Build Alternative are associated with the reconfiguration of the TIs at Ina and Ruthrauff Roads (ADOT 2011d). The increase in elevation of the crossroads to grade separate at the tracks would block the natural north and westerly drainage patterns. The elevated roadways would also place fill on existing storm drains and culverts that were not designed for the additional weight. Drainage improvements would be implemented to gather runoff and convey it around or under the roadway improvements, to replace facilities needing increased strength to support fill, and to add capacity. The elevation and width of the I-10 main line would change; therefore, storm drains would be replaced. The project would be designed to produce no appreciable increase in stormwater elevations on existing roads or adjacent properties.

No Action Alternative

Under the No Action Alternative, the existing drainage conditions and facilities would continue, and no further improvements would be implemented.

3. Mitigation

Arizona Department of Transportation Design Responsibilities

- The Arizona Department of Transportation would provide the Pima County (520-243-1800), Town of Marana (520-382-2600), and City of Tucson (520-837-6692) Floodplain Managers with an opportunity to review and comment on the design plans.

M. Vegetation and Invasive Species

The study area is located within the Arizona Upland subdivision of the Sonoran desertscrub biotic community (Brown 1994). Bi-seasonal rainfall events (approximately 8 to 16 inches annually) support the trees and variety of succulent plants characteristic of this biotic community. Ephemeral drainages transecting the area support xeroriparian vegetation.

The Arizona Department of Agriculture regulates the destruction, removal, or transport of state-protected plants under the Arizona Native Plant Act (Arizona Revised Statutes, Title 3, Chapter 7). The Arizona Department of Agriculture must be notified prior to removal of plants protected under the Act.

Executive Order 13112 requires that federal agency actions, including actions on federal land or projects that are federally funded, shall "...subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded."

The existing vegetation and invasive species were evaluated in a *Biological Evaluation* prepared for this project (ADOT 2011e) and are summarized here.

1. Existing Conditions

The study area is characterized by a combination of vegetation types associated with desertscrub, ephemeral washes, disturbed upland, and landscaping. Urban development along I-10 and its crossroads has resulted in the removal of native vegetation. The I-10 median and ROW have been landscaped with arid landscaping plants and decomposed granite as groundcover. Undeveloped areas adjacent to the eastbound I-10 frontage road between Sunset Road and Curtis Street (in the southern half of the study area) feature disturbed upland with some desertscrub vegetation. Vacant lots near the southern project limits have native and nonnative grasses and forbs.

Plants used in landscaping and occurring naturally within the project ROW include: blue palo verde (*Parkinsonia floridum*), Mexican palo verde (*P. aculeate*), velvet mesquite (*Prosopis velutina*), honey mesquite (*Prosopis glandulosa*), creosote bush (*Larrea tridentata*), quailbush (*Atriplex lentiformis*), sotol (*Dasylirion wheeleri*), hesperaloe (*Hesperaloe funifera*), Santa Rita prickly pear (*Opuntia santa-rita*), agave (*Agave americana*), desertbroom (*Baccharis sarothroides*), fourwinged saltbush (*Atriplex canescens*), desert thorn-apple (*Datura discolor*), and saguaros (*Carnegiea gigantea*).

Vegetation associated with the Cañada del Oro Wash and Rillito River is limited by adjacent development and the use of bank and wash-bottom protection. Within the project limits, both washes are sparsely vegetated by species including burrobush (*Hymenoclea monogyra*), desertbroom, velvet mesquite, desert willow (*Chilopsis linearis*), tobacco trees (*Nicotiana glauca*), tamarisk (*Tamarix* spp.), grasses, and forbs occurring intermittently along the bottom.

Vegetation associated with a drainage channel north of Ruthrauff Road/El Camino del Cerro includes Mexican palo verde, desertbroom, Johnson grass (*Sorghum halpense*), prickly Russian thistle (*Salsola tragus*), giant reed (*Arundo redox*), and Bermuda grass (*Cynodon dactylon*).

The study area was surveyed for native plants protected under the Arizona Native Plant Act. The following protected native plants were found within the study area: velvet mesquite, desert willow, and blue palo verde, as well as six saguaros exceeding 4 feet in height.

The ADOT Natural Resources Management Section was contacted on January 27, 2010, regarding invasive species concerns for this project. A response was received on February 8, 2010, indicating buffelgrass (*Pennisetum ciliare*) is a species of concern for the project (ADOT 2011e). Additional species identified during site reconnaissance are recognized as invasive by the Arizona Wildlands Invasive Plant Working Group (2005), including tamarisk, prickly Russian thistle, Johnsongrass, and giant reed.

2. Build Alternative

The Build Alternative would result in the removal of vegetation from within the project corridor. Impacts to native vegetation would be relatively minor because of the developed nature of the study area and the general lack of native vegetation within project limits.

Soils exposed as a result of ground-disturbing activities experience an increased possibility of being revegetated by invasive species. Additionally, increased truck and foot traffic associated with construction enhance opportunities for invasive species to spread between sites. The proposed project would minimize the

opportunity for the introduction of new invasive species to the project area and control the spread of invasive species by implementing standard measures.

3. No Action Alternative

The No Action Alternative would not affect existing vegetation within the study area or contribute to the spread or propagation of invasive species, except through normal development and maintenance activities.

4. Mitigation Measures

Arizona Department of Transportation Roadside Development Section Responsibilities

- Protected native plants within the project limits would be affected by this project; therefore, the Arizona Department of Transportation Roadside Development Section would determine if Arizona Department of Agriculture notification is needed. If notification is needed, the Arizona Department of Transportation Roadside Development Section would notify the Arizona Department of Agriculture by a “Notice of Intent to Clear Land” at least 60 days prior to the start of construction.

Arizona Department of Transportation Design Responsibilities

- All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.

Contractor Responsibilities

- To prevent the introduction of invasive species, all earthmoving and hauling equipment would be washed at the contractor’s storage facility prior to entering the construction site.
- To prevent invasive species seeds from leaving the site, the contractor would inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.
- All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.

N. Threatened and Endangered Species, Designated Critical Habitat, and Sensitive Species

Threatened and endangered species are species identified as warranting federal protection, as defined in the Endangered Species Act of 1973, and as amended in 1988. Critical habitat area may also be designated for endangered species. The U.S. Fish and Wildlife Service (USFWS) is the managing agency of species federally protected under the Endangered Species Act. The USFWS Arizona Ecological Field Office maintains lists of federally protected species, including threatened and endangered, proposed endangered, and candidate and conservation agreement species with the potential to occur, or with critical habitat occurring, by county.

The Arizona Game and Fish Department (AGFD) is charged with protecting state wildlife species of concern as defined under Arizona Revised Statutes, Title 17. The International Migratory Bird Treaty Act is a federal law protecting migratory birds, their nests, and eggs from harm or harassment.

The *Biological Evaluation* prepared for this project (ADOT 2011e) evaluates the potential for protected species to occur in the project area and impacts to those species, and is summarized here.

1. Existing Conditions

USFWS and AGFD received a scoping letter requesting specific comments or concerns regarding the proposed project. AGFD's online environmental review tool maintains records of special status species and their locations throughout the state. These resources were combined with field reconnaissance to determine the potential for threatened and endangered and sensitive species to occur.

Threatened and Endangered Species

A response letter dated November 23, 2010, was received from USFWS indicating that the study area falls within the range of the federally endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*). Although the study area falls within the range of the lesser long-nosed bat, no suitable day-roost structures occur within the study area, and forage species are limited to six saguaros used in median landscaping. These cacti would provide minimal forage opportunity when compared with the large number of saguaros outside the project limits; therefore, the project area does not support suitable habitat for the species. No threatened or endangered species, or their critical habitat occur within the project area.

Sensitive Species

In its response letter, USFWS also identified two sensitive species protected under the International Migratory Bird Treaty Act with the potential to occur within the study area: the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) is an Arizona wildlife species of concern, and the Western burrowing owl (*Athene cunicularia hypugaea*) is a federally listed species of concern. AGFD provided a letter dated October 22, 2010, with no specific sensitive species concerns. The AGFD online environmental review tool was used and the project area was reviewed for state-protected wildlife species of concern and birds protected under the International Migratory Bird Treaty Act.

The study area does not feature suitable habitat for the cactus ferruginous pygmy-owl or other species identified on the online environmental tool receipt as occurring within 3 miles of the project area, including yellow-billed cuckoo (*Coccyzus americanus*), black-bellied whistling-duck (*Dendrocygna autumnalis*), Western narrow-mouthed toad (*Gastrophryne olivacea*), and California leaf-nosed bat (*Macrotus californicus*).

No burrowing owls or sign such as pellets or tracks were observed during site visits; however, the study area features active small mammal burrows and relatively undisturbed areas, suggesting the potential for occupied habitat within and around the study area. The bridges in the project area provide potential nesting habitat for swallows.

2. Build Alternative

No threatened or endangered species or critical habitats occur within the study area; therefore, no impacts on these species are anticipated.

Ground-disturbing activities associated with the Build Alternative would affect potential burrowing owl and swallow nesting habitat; preconstruction burrowing owl surveys and measures to avoid impacts to nesting swallows are recommended.

3. No Action Alternative

The No Action Alternative would not result in ground-disturbing activities that could disturb sensitive species or the alteration or removal of potential habitat; except during routine maintenance activities.

4. Mitigation Measures

Contractor Responsibilities

- The contractor would employ a qualified biologist to complete a preconstruction survey for burrowing owls 96 hours prior to construction in all suitable habitat that would be disturbed. The biologist would possess a burrowing owl survey protocol training certificate issued by the Arizona Game and Fish Department. Upon completion of the surveys, the contractor would contact the Arizona Department of Transportation Environmental Planning Group (602-712-7767) to provide the survey results.
- If any burrowing owls are located during preconstruction surveys or construction, the contractor would employ a qualified biologist holding a permit from the U.S. Fish and Wildlife Service to relocate burrowing owls from the project area, as appropriate.
- If burrowing owls or active burrows are identified during the preconstruction surveys or during construction, no construction activities would take place within 100 feet of any active burrow until the owls are relocated.
- The contractor would not cause injury or death to swallows (including eggs and nestlings) and would avoid work within 200 feet of nesting swallows from February 1 to August 30 of any calendar year. If work would occur within 200 feet of nesting cliff swallows between February 1 and August 30, the contractor would adhere to the following:
 - The contractor would completely remove all existing swallow nests within 200 feet of work areas after August 30 but prior to February 1 to prevent cliff swallows from reusing those nests.
 - The contractor would implement exclusionary measures to prevent swallows from building new nests within 200 feet of work areas. Exclusionary measures would be implemented in all areas where swallows are likely to nest, and may include: (a) continually removing nesting materials during early nest construction when eggs or nestlings are not present, (b) installing exclusionary netting (wire or plastic mesh 0.75 inch or less in diameter), (c) installing deterrent spike strips, and/or (d) applying an appropriate bird exclusion liquid or gel.
 - The contractor would not disturb any active swallow nests (completed or partially completed nests that contain eggs or nestlings). If any active nest is discovered within 200 feet of construction activities, work would stop and the Arizona Department of Transportation Biologist would be contacted (602-712-7767) to evaluate the potential for disturbance of nests.
 - The contractor would monitor and maintain the effectiveness of exclusionary measures used. Netting would be maintained such that it remains in place without any loose areas or openings that could trap and/or entangle birds. Spike strips would be maintained such that they remain in place. Exclusion liquid or gel would be reapplied as often as necessary to remain effective.
 - The contractor would remove all exclusionary measures after project completion to the satisfaction of the Engineer.

O. Hazardous Materials

Hazardous materials and hazardous waste sites pose a threat to any infrastructure project, beginning with ownership liability concerns and ending with construction safety concerns. EPA's 2002 Brownfields Act identified the appropriate steps of all-appropriate inquiry for investigating hazardous materials sites, and the American Society for Testing and Materials (ASTM) International E1527-05 standard was written to provide a set of guidelines for the assessment of properties and the qualifications of environmental professionals engaged to perform the analysis (ASTM International 2006). Once a corridor is selected, an initial site assessment is performed to assess specific sites of potential concern along the corridor in more detail. The initial site assessment conforms to the ASTM E1527-05 standard and includes site-specific analysis with interviews and historic waste-stream data analysis.

The goal of the hazardous materials initial site assessment is to provide adequate information for the project owner to move forward with property acquisitions and to develop management strategies for sites that have been identified with hazardous materials and/or hazardous-waste issues.

1. Existing Conditions

A Phase I Initial Site Assessment (ADOT 2009b) was conducted for the I-10 corridor to identify recognized environmental conditions that may affect construction or acquisition. The assessment included a review of previous environmental reports in the study area, which were found to be extensive. Following construction of the frontage roads, a postconstruction report was prepared in 2003, and an Initial Site Assessment was also completed for Ina Road for the Town of Marana in 2009. In addition, a focused Phase I Initial Site Assessment (ADOT 2011f) was conducted for Ruthrauff Road with an emphasis on commercial sites.

The Phase I Initial Site Assessment identified sites of concern based on the records search and review of previous studies, and the focused Phase I Initial Site Assessment identified sites of concern based on a combination of environmental records review, city directory review, and conditions observed during parcel-specific field reconnaissance activities. A total of 41 sites of concern were identified in the project corridor (see Table 20).

Concrete structures within the corridor may contain asbestos and paint may contain lead.

2. Build Alternative

Deep borings associated with construction of bridges, including support for TIs, may contact contaminated groundwater associated with the El Camino del Cerro Water Quality Assurance Revolving Fund site near Sunset Road. A Contaminated Media Management Plan and environmental construction monitoring methods would be developed for any activities that may contact groundwater near this site and to address worker and environmental exposure, soil and groundwater handling, and analysis and disposal.

Table 20. Hazardous materials sites of concern within project corridor

No.	Name	Address or location	Recommendation for assessment ^a
Interstate 10 Corridor			
1	El Camino del Cerro WQARF ^b site	Underlies I-10 ^c between Sunset and Ruthrauff Roads	CMMP ^d and ECM ^e
2	Cal Portland Cement	6601 N. Casa Grande Highway	Site-specific ESA ^f
3	Cardinal Casting	5300 N. Casa Grande Highway	Site-specific ESA
4	Road Safe	5254 N. Casa Grande Highway	Site-specific ESA
5	Bingham Equipment	5225 N. Casa Grande Highway	Site-specific ESA
6	Kaylor Trailer	5201 N. Casa Grande Highway	Site-specific ESA
7	Cowtown Boots	5190 N. Casa Grande Highway	Site-specific ESA
8	911 Collision Center	5150 N. Casa Grande Highway	Site-specific ESA
9	Moorewood and Yeager Furniture	5140 N. Casa Grande Highway	Site-specific ESA
10	Rainbow Play Systems	5128 N. Casa Grande Highway	Site-specific ESA
11	Jay's Tack Shack	5080 N. Casa Grande Highway	Site-specific ESA
12	Tire Industries	5050 N. Casa Grande Highway	Site-specific ESA
13	Jenk's Café	5000 N. Casa Grande Highway	Site-specific ESA
14	IRS Radiator Service	4998 N. Casa Grande Highway	Site-specific ESA
15	National Truck Stop	4966 N. Casa Grande Highway	Site-specific ESA
16	Tucson Shipyards/ Cummings Plumbing	4950 N. Casa Grande Highway	Site-specific ESA
17	American Paint and Body	4419 N. Highway Drive	Site-specific ESA
18	I-10 eastbound Ina Road ramp	7050 N. Casa Grande Highway	Site-specific ESA
19	Maxim Crane Works	5175 N. Casa Grande Highway	Site-specific ESA
20	Trucking facility	5135 N. Casa Grande Highway	Site-specific ESA
Ina Road vicinity			
21	Former Whiting Station #163	4439 W. Ina Road	Site-specific ESA
22	Starbucks parcel	4905 W. Ina Road	Site-specific ESA
23	Ina Road Automotive Services	4901 W. Ina Road	Site-specific ESA
24	Circle K #5537	4900 W. Ina Road	Site-specific ESA
25	Circle K #946	4500 W. Ina Road	Site-specific ESA
26	Jiffy Lube	4465 W. Ina Road	Site-specific ESA
27	Ina Road Wastewater Treatment Plant	7101 N. Casa Grande Highway	Site-specific ESA
Ruthrauff Road/El Camino del Cerro vicinity			
28	Chevron	3030 W. Ruthrauff Road	PSI ^g
29	Gilbert Pump	2840 W. Ruthrauff Road	PSI
30	Weber Group	2838 W. Ruthrauff Road	PSI

(continued on next page)

Table 20. Hazardous materials sites of concern within project corridor (continued)

No.	Name	Address or location	Recommendation for Assessment ¹
<i>Ruthrauff Road/El Camino del Cerro vicinity (continued)</i>			
31	AM/PM	2790 W. Ruthrauff Road	PSI
32	Pacific Pride/Union Distribution	4700 Highway Drive	PSI
33	Vroman's Auto Body	2729 W. Ruthrauff Road	PSI
34	Super H Liquors (former Quik Mart)	2710 W. Ruthrauff Road	PSI
35	Firebird Fuel Company	4703 N. Parkway Drive	PSI
36	Neff Rental	2819 W. Ruthrauff Road	Site-specific ESA
37	Gamble property	3210 W. Ruthrauff Road	Site-specific ESA
38	Whitney Burns Shutters	2755 W. Ruthrauff Road	Site-specific ESA
39	Ross Intertraders	4844 N. Davis Ave.	Site-specific ESA
40	City of Tucson (vacant)	4767 N. Parkway Drive	PSI
41	Car Wash	2705 W. Ruthrauff Road	PSI

^a for sites involving work or acquisition

^b Water Quality Assurance Revolving Fund

^c Interstate 10

^d contaminated media management plan

^e environmental construction monitoring

^f environmental site assessment

^g preliminary site investigation

Sites listed in Table 20 are located within or adjacent to the proposed construction footprint for the Build Alternative and have the potential to contain contaminants. Therefore, the Build Alternative has the potential to expose subsurface contaminants during construction, if present. Many of these sites would involve full or partial acquisition to accommodate improvements. Additional hazardous materials investigations would be conducted: site-specific initial site assessments for any acquisitions associated with these sites to confirm whether further investigation is needed and preliminary site investigations for work within certain sites, as recommended in the report, to verify or refute the existence of actionable concentrations of released hazardous materials. Remediation of some sites would potentially be needed to remove hazardous conditions prior to development.

Construction activities would include some demolition of structures and disturb concrete and paint that may contain asbestos and lead, respectively. Sampling and analysis of structures and painted surfaces would be conducted prior to construction to confirm the presence/absence of these substances and to determine whether abatement would be required. If present, abatement would be conducted in conjunction with disturbance or demolition.

3. No Action Alternative

Under the No Action Alternative, there would be no ground disturbing activities that could expose subsurface contaminants. Disturbance of existing structures would be limited to routine maintenance activities.

4. Mitigation Measures

Arizona Department of Transportation Design Responsibilities

- Site-specific environmental site assessments would be conducted prior to property acquisition for the properties as recommended in the 2009 Phase I Initial Site Assessment.
- Preliminary site investigations would be conducted for locations where construction activities would occur within 100 feet of relevant facilities, and where such activities would involve ground disturbance at depths of 18 inches or greater. The preliminary site investigation would include a drilling and sampling program to verify or refute the existence of actionable concentrations of released hazardous materials. The analytical program would be targeted to determine the concentration of residual impacts for facilities recommended in the 2011 Phase I Initial Site Assessment.
- During final design, the Arizona Department of Transportation Project Manager would coordinate with the Arizona Department of Transportation Environmental Planning Group Hazardous Materials Coordinator (602-712-7767) to complete testing for asbestos and lead-based paint within the project limits and, if necessary, recommend remediation measures.
- The Arizona Department of Transportation Project Manager would contact the Arizona Department of Transportation Hazardous Materials Coordinator (602-712-7767) 30 days prior to bid advertisement to determine the need for additional site assessment.

Arizona Department of Transportation District Responsibilities

- The Arizona Department of Transportation would inform contractors of the potential contamination associated with hazardous materials sites.
- The Engineer would review the National Emissions Standards for Hazardous Air Pollutants notification received from the contractor. The contractor would not start work associated with any structures until 10 working days have passed since submittal of the notification to regulatory agencies.

Contractor Responsibilities

- The contractor would immediately stop all subsurface activities and contact the Engineer in the event that potentially hazardous materials or hydrocarbons are encountered, an odor is identified, or significantly stained soil is visible during construction. The contractor would follow all applicable regulations regarding discovery and response for hazardous materials encountered during the construction process.
- The contractor would prepare a Contaminated Media Management Plan for work conducted within 200 feet of the current El Camino del Cerro groundwater plume (based on the latest available Arizona Department of Environmental Quality maps). The plan would address requirements for worker and environmental exposure, monitoring, sampling, storage, and disposal, as applicable. The plan would be submitted to the Arizona Department of Transportation Environmental Planning Group Hazardous Materials Coordinator (602-712-7767) for approval.
- Environmental construction monitoring for geotechnical boring within 200 feet of the current El Camino del Cerro groundwater plume (based on the latest available Arizona Department of Environmental Quality maps at time of work) would be conducted consistent with the approved Contaminated Media Management Plan prepared for project construction.

- The contractor would complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with any structures and submit it to the Engineer for review. After Engineer approval, the notification would be submitted to the Arizona Department of Transportation Hazardous Material Coordinator (602-712-7767) for a 5 working day review and approval. Upon approval by the Hazardous Material Coordinator, the contractor would file the notification with the Arizona Department of Environmental Quality and the Pima County Department of Environmental Quality at least 10 working days prior to demolition/renovation associated with any structures.
- The contractor would not start work associated with the demolition/renovation of structures until 10 working days have passed since the submittal of the National Emissions Standards for Hazardous Air Pollutants notification to the regulatory agencies.
- During construction operations, should material be encountered that the contractor believes to be hazardous or contaminated, the contractor would immediately stop work and remove workers within the contaminated areas, barricade the area, provide traffic controls, and notify the ADOT Engineer in accordance with the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 107.07, Sanitary Health, and Safety Provisions, dated 2008.

P. Material Sources and Waste Materials

The contractor is responsible for obtaining the required materials for the project and disposing of excessive materials. ADOT maintains a list of material sources that have previously completed the ADOT environmental analysis process. An updated environmental analysis must be submitted for ADOT approval to use one of these sources. Alternatively, a contractor can propose and evaluate a new source. Excessive materials must be disposed of consistent with federal, state, and local regulations, and materials from off-site sources must be approved prior to use. The potential for the project to generate excessive fill material or to require additional materials from off-site sources is evaluated in this section.

1. Existing Conditions

There are approximately 27 ADOT-approved material source facilities in Pima County. A review of ADOT's material sources list (ADOT 2011g) indicates approximately 6 facilities are near the project site.

2. Build Alternative

Approximately 600,000 cubic yards of material would be excavated from the existing roadway fills in order to lower the interstate to the new profile grades. The new elevated profiles of the crossroads and frontage roads would require extensive fill material, resulting in the use of excavated material and the import of at least an additional 500,000 cubic yards. If any excavated material is contaminated and needs to be disposed of, that material would need to be replaced by additional fill. The contractor would be responsible for using approved sites to dispose of excess waste material and construction debris, and for disposal of contaminated material in accordance with local, state, and federal laws and regulations.

3. No Action Alternative

The No Action Alternative would not generate fill materials or require materials from outside sources. Additionally, the No Action Alternative would not generate waste material and construction debris requiring disposal.

4. Mitigation Measures

Contractor Responsibilities

- Materials required for this project from sources outside of the project area would be examined for environmental effects by the contractor prior to use, through a separate environmental analysis in accordance with the Arizona Department of Transportation’s *Standard Specifications for Road and Bridge Construction*, Section 1001, Material Sources, dated 2008. Additionally, excess waste material and construction debris would be disposed of at sites supplied by the contractor in accordance with those standard specifications (Arizona Department of Transportation 2008).
- Materials would be disposed of consistent with the Arizona Department of Transportation’s *Standard Specifications for Road and Bridge Construction*, Section 107, Legal Relations and Responsibility to Public, dated 2008. Materials removed during construction operations such as trees, stumps, building materials, irrigation and drainage structures, broken concrete, and other similar materials would not be dumped on either private or public property unless the contractor has obtained written permission from the owner or public agency with jurisdiction over the land. Written permission would not be required, however, when materials are disposed of at an operating public dumping ground.

Q. Secondary Impacts

Secondary impacts are defined in the CEQ guidelines as impacts that are reasonably foreseeable consequences of the action, but are later in time or farther removed in distance (40 C.F.R. § 1508.8). Secondary impacts may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Actions that may induce secondary (or indirect) impacts may be less obvious than those identified as direct impacts, more difficult to quantify, additive in nature, or long-term in occurrence and effect. This section identifies the likely, foreseeable secondary impacts that would result from construction of the proposed freeway improvements; any cumulative impacts are addressed in the following section. Secondary impacts on resources not included in the discussion below were considered negligible. The classification of secondary and cumulative impacts is presented in Table 21.

Table 21. Secondary and cumulative impacts classification

Impact category	Impact classification	Description
Type	Neutral, positive, or negative	Compares the final condition of a given resource with its existing condition (assumes that the expected impact occurs); impacts on personal property are considered negative
Severity	Minor, moderate, or substantial	Considers the relative contribution of the proposed action to a given impact
Duration	Temporary or permanent	Assumes “permanent” unless otherwise specified

Land Ownership, Jurisdiction, and Land Use

Land use conversion, development, and area growth in the study area are governed by the zoning and general plans of the local jurisdictions. Development is generally viewed as a favorable economic condition of land

use. The Build Alternative would improve local traffic operation and access, which may improve the commercial development appeal of the Ina and Ruthrauff Roads, accelerate development of the remaining vacant parcels, and encourage redevelopment of existing parcels. Acquisition would also result in remnant parcels that have the potential to be suitable for redevelopment. Therefore, secondary impacts would be considered moderate and positive.

Social and Economic Considerations

With improved access to the study area, the commercial appeal of Ina and Ruthrauff Roads may be increased, leading to expanded economic development. While direct access to crossroads would be eliminated from properties closest to the TIs, access and traffic operation for the area would generally be improved and may attract new customers and business to the area. Improved traffic operation on I-10 would also contribute to the transportation of goods at local, regional, and interstate levels. Therefore, secondary impacts would be considered moderate and positive.

Cultural Resources

As indicated above, the project may increase the commercial appeal of Ina and Ruthrauff Roads, leading to expanded economic development along these corridors, including new development on vacant land, infill parcels, or the urban renewal or redevelopment of existing properties. Urban renewal may involve retrofit or replacement of existing structures, and may affect cultural resources sites and historic structures that may be or could become NRHP-eligible. Any redevelopment would be governed by the applicable local land use manager (Tucson, Marana, or Pima County) and mitigated through the enforcement of local and state requirements regarding historic resources. Therefore, secondary impacts would be considered minor to moderate (depending on the extent and eligibility of affected structures) and negative.

Hazardous Materials

If development is stimulated, some of the contaminated properties within the study area may be considered economically viable to remediate and develop. This could lead to clean up of contaminated sites in the area and would be considered a substantial and positive impact.

Railroads

Grade separation with the railroad would allow future expansion of UPRR to occur with no disruption to traffic flow or railroad operation. Therefore, secondary impacts would be moderate and positive.

R. Cumulative Impacts

Cumulative impacts include the direct and indirect impacts of a project together with the impacts of all other anticipated past, present, and reasonably foreseeable future actions in the area, including those of others. This analysis of cumulative impacts concentrates on current and future actions that could contribute to cumulative impacts of key considerations. Past, present, and reasonably foreseeable future actions considered in this analysis are the result of planned/proposed projects developed by the City of Tucson, Town of Marana, and Pima County, as well as private developers.

For this cumulative impacts assessment, past, present, and reasonably foreseeable future transportation projects and non-transportation related projects are considered. This EA assumes that the local municipalities and county comprehensive and general plans direct the type of development within the study area. This development would likely occur eventually whether or not the Build Alternative is implemented.

1. Past Actions and Completed Projects

Current environmental considerations are detailed in Part IV, Sections B through P, and consider the recent completion of the following projects:

- PCRWRD – as part of its ROMP, the agency recently installed an interconnect pipe adjacent to the eastbound frontage road to manage effluent loads between the Roger Road and the Ina Road Water Reclamation facilities
- PCRWRD operates two wastewater treatment facilities east of I-10: the Roger Road Water Reclamation facility south of El Camino del Cerro and the Ina Road Water Reclamation facility south of Ina Road. As part of the ROMP, PCRWRD is in the process of modernizing and expanding its facilities. Also see Section K, *Water Resources*, for discussion of these facilities.
- ROMP Trail – bike/pedestrian trail following the interconnect pipeline access road from Ted Walker Park south to Ruthrauff Road
- New Circle K gas station and convenience store on Ina Road
- Ina Freedom Self Storage on Ina Road

2. Ongoing and Present Actions

Within the study area, ongoing or present actions that have a cumulative impact on the Build Alternative include:

- PCRWRD ROMP – the master plan involves the modernization and expansion of the Roger Road and Ina Road Water Reclamation facilities; construction of a lab, office space, and a solar energy plant; and planning for short- and long-term improvements
- Santa Cruz River Trail – ongoing improvements between Ina and Grant Roads
- CPC – ongoing sand and gravel extraction operations
- UPRR improvements – ongoing improvements to double-track the rail line through the project limits

3. Reasonably Foreseeable Future Actions

- Ina Road improvements – widening the road and completing Santa Cruz River bridge improvements west of the project limits
- Sunset Road, Silverbell Road to River Road – project would construct Sunset Road from Silverbell Road east to I-10 and from I-10 east to River Road
- Silverbell Road, Grant Road to El Camino del Cerro – widening the road
- Silverbell Road, El Camino del Cerro to Ina Road – widening the road
- Cañada del Oro Trail improvements – extension of trail facilities westward to include a pedestrian underpass at the railroad and I-10 bridges

The Build Alternative, when combined with past, present, and future actions, would improve access within and through the study area.

Land Ownership, Jurisdiction and Land Use

While much of the project vicinity is already built-out, there are still some undeveloped areas anticipated for commercial, municipal, or residential use. In conjunction with Pima County's Sunset Road improvements, the Build Alternative would potentially influence commercial development along the Sunset Road corridor. Development within the project vicinity would occur irrespective of the Build Alternative or No Action Alternative, resulting in land conversion. However, the improved traffic operation and new local access pattern that would be result from the Build Alternative and other local transportation projects would likely influence future land uses on a localized basis. The application of local jurisdiction requirements (zoning, general plan) would substantially mitigate any cumulative impact of the proposed project on land use in the study area. Therefore, when considered with past, present, and reasonably foreseeable future projects, the Build Alternative would have neutral cumulative impacts on land use.

Social and Economic Considerations

Ina and Ruthrauff Roads are currently commercial corridors, and recent commercial development, such as the Circle K and the storage facility on Ina Road and the ARCO service station on Ruthrauff Road, demonstrate the area's continuing economic development. Municipal expansion/improvement projects are likely to contribute additional employment to the vicinity. I-10 provides access to these commercial corridors, but capacity and operation are hindered by ongoing LOS degradation attributable to congestion and train traffic, and may lead to long-term effects on local businesses and residences. The Build Alternative, in conjunction with other planned improvements, including improvements to Ina Road, Silverbell Road, and the new Sunset Road connection, would improve traffic operation in the region. By improving access and traffic movement, the Build Alternative would be expected to support the area's economic growth.

The completion of all projects in the area would result in an improved transportation network. Currently, the closure of one arterial for construction, maintenance, or incidents overwhelms the remaining roadways. The resulting network would be more balanced and would tolerate closures.

Therefore, when considered with past, present, and reasonably foreseeable future projects, the Build Alternative would have a positive and moderate cumulative impact on socioeconomics.

Cultural Resources

Cumulative disturbance or loss of cultural resources may occur with any type of development, including past, present, and foreseeable future projects. Actions occurring on federal land, or as a result of federal activities, would be subject to review under Section 106 of the National Historic Preservation Act, which requires federal agencies to take into account the effects of their undertakings on historic properties. Actions occurring on state land, or as a result of state activities, would be subject to review under Arizona Revised Statute §41-864. Additionally, both Pima County and the City of Tucson have procedures in place to review projects under their jurisdiction for potential effects to historic properties. Under state and federal law, mitigation plans including documentation and data recovery would be developed and implemented through consultation with SHPO, Tribes, agencies, and other stakeholders for any cultural resources eligible for inclusion in the National or Arizona Registers of Historic Places that could not be avoided. The Build Alternative may encourage private development that may not be subject to review under federal, state, or local statutes, resulting in the possibility of historic properties being lost without documentation or data recovery. Therefore, when considered with past, present, and reasonably foreseeable future projects, the Build Alternative would have a minor negative cumulative impact on cultural resources.

Air Quality

Neither the Build Alternative nor the No Action Alternative would contribute to NAAQS violations. However, the Build Alternative would reduce air pollution through congestion relief. In addition, the resulting network of improvements would provide improved traffic operation on a regional basis and reduce congestion. Therefore, when considered with past, present, and reasonably foreseeable future projects, the Build Alternative would have a minor and positive cumulative impact on air quality.

Traffic Noise

Evaluated properties within the study area would experience a 0- to 6-dBA increase in traffic noise levels, including levels above 64 dBA; however, several properties would experience a 1- to 5-dBA reduction in noise levels from existing conditions. Therefore, when considered with past, present, and reasonably foreseeable future projects, the Build Alternative would have a moderate negative cumulative impact on noise.

Water Resources

The Build Alternative may result in the continuing or increase in usage of water resources by encouraging development and growth. Similarly, growth and development may result in the conversion or alteration of natural drainage features. Therefore, when considered with past, present, and reasonably foreseeable future projects, the Build Alternative would have a minor negative cumulative impact on water resources.

V. Public Involvement and Project Coordination

The National Environmental Policy Act and FHWA policies stipulate a responsibility to involve cooperating agencies, stakeholders, and members of the public for the purpose of arriving at objective and responsible transportation decisions. Pursuant to 23 U.S.C. 128 and 40 C.F.R. Parts 1500 through 1508, states must carry out an FHWA-approved public involvement/public hearing program. These processes are implemented to ensure that all stakeholders, agencies, members of the public, and affected parties have an opportunity to provide comments and contribute to decision-making processes.

A. Agency Scoping

Scoping letters, including an invitation to a scoping meeting, were sent to the agencies and stakeholders identified in Table 22. The scoping letters described the project location and potential improvements to be studied, and requested comments.

Table 22. Agencies and stakeholders

Agency	
Federal	
Federal Emergency Management Agency	U.S. Forest Service
U.S. Army Corps of Engineers	U.S. National Park Service, Saguaro National Park
U.S. Department of Agriculture, Natural Resources Conservation Service	U.S. Postal Service, Mountain View Post Office
U.S. Department of the Interior, Bureau of Land Management	U.S. Representative, 7th District of Arizona Tucson District Office
U.S. Environmental Protection Agency, Region 9	U.S. Representative, 8th District of Arizona Tucson District Office
U.S. Fish and Wildlife Service	U.S. Senators – Tucson offices
State	
Arizona Corporation Commission	Arizona Senators and Representatives for Districts 25, 26, 27, 28, 29, and 30
Arizona Department of Public Safety	Arizona State Land Department
Arizona Game and Fish Department	Southern Arizona Governor’s Office
Local agencies and organizations	
AT&T	Pima County Regional Flood Control District
Amphitheater School District	Pima County Schools Superintendent
Center for Biological Diversity	Pima County Sheriff
City of Tucson City Council	Pima County Solid Waste Division
City of Tucson City Manager	Pima County Supervisors for Districts 1, 2, 3, 4, 5
City of Tucson Community Services	Pima County Traffic Engineering Division
City of Tucson Development Services	Pima County Transportation
City of Tucson Engineering	Pima County Regional Wastewater Reclamation Department
City of Tucson Environmental Services	Rural Metro Fire Department
City of Tucson Fire Department	San Carlos Apache Nation
City of Tucson Mayor	Sierra Club Rincon Group
City of Tucson Parks and Recreation	Sky Island Alliance
City of Tucson Planning and Development	Southwest Gas

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Table 22. Agencies and stakeholders (continued)

Agency	
Local agencies and organizations (continued)	
City of Tucson Police Department	Sprint
City of Tucson Transportation Department	St. Mary's Hospital
Comcast Communications	SunTran
Conoco Phillips	SunVan
Cortaro Marana Irrigation District	Tohono O'odham Nation
El Paso Natural Gas	Town of Marana Development Services
Flowing Wells Irrigation	Town of Marana Engineering
Flowing Wells Unified School District	Town of Marana Mayor
Hopi Tribal Council	Town of Marana Parks and Recreation
Kinder Morgan	Town of Marana Police Department
Level 3 Communications	Town of Marana Public Services
Marana Airport	Town of Marana Town Council
Marana Chamber of Commerce	Town of Marana Town Manager
Marana Unified School District	Tucson Audubon Society
Northwest Medical Center	Tucson Black Chamber of Commerce
Northwest Fire District	Tucson Electric Power
Pascua Yaqui Tribe	Tucson Hispanic Chamber of Commerce
Pima Association of Governments	Tucson Inet Fiber
Pima Community College	Tucson Metropolitan Chamber of Commerce
Pima County Cultural Resources	Tucson Unified School District
Pima County Development Services	Tucson Water Department
Pima County Department of Environmental Quality	Union Pacific Railroad
Pima County Natural Resources, Parks and Recreation	Verizon Business
Pima County Public Works	White Mountain Apache Tribe
Pima County Planning and Development Services	Xspedius Communications Co. – TW Telecom
Qwest (now CenturyLink)	Yavapai-Apache Nation

An agency scoping meeting was held on October 28, 2009, at the Pima County Natural Resources, Parks and Recreation facility and was attended by 41 people representing 13 organizations. The meeting purpose was to introduce the project, discuss the project purpose and need, and discuss development of project alternatives in order to obtain comments and concerns from affected stakeholders to inform the project team during the preliminary design and environmental work. Written comments were received from nine agencies in response to scoping and are included in Appendix B. Written and oral comments are summarized by topic in Table 23.

Table 23. Agency scoping meeting summary of comments

Organization	Comment
Agency coordination	
Marana	How would the Town Council be contacted about the project?
Union Pacific Railroad	May want to share project information with the Arizona Corporation Commission; gray area regarding Arizona Corporation Commission jurisdiction on overpasses and grade separations.
Pima County	Confirmed that Pima County is an interested party.
U.S. Army Corps of Engineers	The U.S. Army Corps of Engineers would like to stay involved in the design process to minimize impacts to washes.
Alternatives	
Arizona Department of Transportation	Consider tunneling under the railroad (may reduce costs and business impacts). Arizona Department of Transportation does not support alternatives that would require pumping like at Orange Grove Road/Union Pacific Railroad crossing due to long-term maintenance issues. How would design concept report and environmental assessment deal with alternatives (menu or one process)?
Marana	Town would support a tunnel if storm drains, rather than pumps, could be used. Acknowledged maintenance issues with pumps.
Tucson	The City does not support crossroads going under the railroad because of proximity to river and related flooding concerns.
Construction and access	
Arizona Department of Transportation	Without access to frontage roads, the project would be vulnerable because there is no place to put traffic during an accident. During Interstate 10 downtown construction, the frontage roads were always available. Project team must follow Federal Highway Administration requirements for access roads, and must be feasible. Grades must also be acceptable.
Federal Highway Administration	Sunset Road would be a good connection to River Road. Americans with Disabilities Act requirements for pedestrians need to be followed.
HDR Engineering, Inc.	Inquired whether Federal Highway Administration change of access report is required.
Level 3 Communications	Suggest putting mile markers on temporary construction barriers.
Marana	Interested in study of impacts of closures on Ina and Ruthrauff Roads with and without Sunset Road connections. Massingale Road could become a construction detour and may need to be closed during construction as it is not designed to accommodate that level of traffic.
Northwest Fire District	Concerned about response to medical calls (80–85 percent of all calls) and access. Primary concerns are narrow lane widths with fire trucks blocking traffic and correct mileposts visible.
Pima County	Interested in traffic study and how street closures would affect operation and access, as well as current demand for Sunset Road. Suggested connection to the west probably more important than east.
Sunset Road	
Arizona Department of Transportation	Connecting Sunset Road with Silverbell and River Roads could serve as a detour during construction/closure of traffic interchanges. Consider grade separation at Sunset Road, rather than just widening. Regional Transportation Authority funding is insufficient to grade separate. If Sunset Road were eliminated, the main line bridges would still need to be replaced at tremendous cost, which could pay for a grade separation at an equivalent cost. The team may not save money by eliminating approaches at Sunset Road.

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Table 23. Agency scoping meeting summary of comments (continued)

Organization	Comment
Sunset Road (continued)	
Tucson	City is most concerned about access to business and new development.
Utilities and railroads	
Arizona Department of Transportation, Tucson	The teams should confirm railroad drainage and other improvement plans.
Kinder Morgan and Associates	Provided provisions to be considered in design and construction of improvements near its facilities.
Level 3 Communications	Biggest concern is time needed to relocate. Level 3 is on the east side of the tracks in Union Pacific Railroad right-of-way. Poor drainage and erosion can affect fiber optic line.
Sprint, Southwest Gas	Provided information on the location of its facilities within the corridor. Southwest Gas noted that relocation is limited due to seasonal demand April through September.
Tucson Electric Power	Does not support the preliminary build alternative as presented. Comments emphasize impacts to its facilities from proposed new local access street that would connect Camino de la Cruz east to Camino Martin through Tucson Electric Power property. Impacts identified include reduction in property functionality, reduced access, loss of Tucson Electric Power park and ride, impacts to internal circulation, potential impacts to substation facilities/relocation of substation, loss of mature landscape vegetation, and reduction in security.
Tucson Water	Tucson Water has 24 crossings and water lines along Interstate 10 and monitoring wells in the area. No expansion is planned.
Qwest (now CenturyLink)	Encouraged that the project would not affect frontage road bridges at washes where Qwest has equipment. Qwest planners may be interested in putting conduit on crossroad bridges.
Environmental justice	
Marana	Question whether environmental justice community has been named by executive order.
Parks and trails	
Tucson	Pima County plans to connect Rillito Creek Park and Santa Cruz River Park; project team may want to make provisions to accommodate trail under the bridge structures.
Pima County	Planning to connect the Santa Cruz and Rillito Creek Parks (trails) that may result in modifications to the bridges that cross the Rillito Creek and require joint coordination with this project. Pima County master plan has trails under the freeway at washes, so the project needs to accommodate trail use.
Water resources, hazardous materials	
Federal Highway Administration	Are there any impaired waters in the project area?
Marana	Suggest in-lieu fee mitigation rather than on-site mitigation as much easier and preferred by the U.S. Army Corps of Engineers.
Northwest Fire District	Suggestion to contact Arizona Department of Environmental Quality regarding Water Quality Assurance Revolving Fund site at El Camino del Cerro landfill. District forwarded information regarding the site.
Federal Emergency Management Agency	Provided a summary of the National Floodplain Insurance Program requirements and local floodplain manager contact information.
Public involvement	
Arizona Department of Transportation	Consider early discussion with businesses to let them know they may be affected by project.

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Table 23. Agency scoping meeting summary of comments (continued)

Organization	Comment
Public involvement (continued)	
Marana	The Town holds pre-application meetings with business and informs business owners about projects that could affect them.
Tucson Metropolitan Chamber of Commerce	Interested in information on how the project would affect member businesses. Understand fine line between scaring business off and informing them.
Wildlife, threatened and endangered species	
Arizona Game and Fish Department	Requested continued involvement in the project. Focus would be to ensure existing wildlife populations and their habitat are not negatively affected or eliminated by the proposed activities, existing wildlife corridors are not disrupted or eliminated, and new structures or designs are wildlife-friendly. No listed threatened or endangered species identified within 3 miles of the project site; a candidate species (yellow-billed cuckoo) is within 3 miles of the project.
U.S. Fish and Wildlife Service	The project area falls within the range of the endangered lesser long-nosed bat, includes habitat for the cactus ferruginous pygmy-owl (formerly listed endangered), and may contain habitat for the Western burrowing owl, a sensitive bird protected by the Migratory Bird Treaty Act.
Other	
Arizona Department of Transportation	<p>The environmental assessment needs to be a manageable size. If an environmental assessment is needed, the team wants to know early.</p> <p>Ruthrauff Road to Prince Road goes to construction in fall 2010 and knowledge would be gained from that project, and lessons learned may be applied to this project.</p> <p>Arizona Department of Transportation’s Office of Environmental Services is looking at wildlife connectivity and accidents and increasing linkages between the Cañada del Oro Wash, Santa Cruz River, and Rillito Creek. The appropriateness of bat boxes would be evaluated.</p> <p>The project website is available at <www.i10tucsondistrict.com/itor>.</p> <p>Permitting process required for access modifications. Suggested running any modifications by the Tucson District before approach businesses with suggestions. We should not be proposing access points that can’t be permitted.</p>
Federal Highway Administration	How much can be used from the 1993 environmental assessment? How would an environmental impact statement affect the schedule?
Hopi Tribe	Claims cultural affiliation to prehistoric cultural groups in Arizona, supports identification and avoidance of prehistoric archaeological sites and traditional cultural properties, including archaeological sites of Hopi ancestors, and recommended early archaeological coordination and continuing consultation.
Marana, Tucson	Team may want to approach the Regional Transportation Authority about shifting project outside the 5-year time frame. This may be a good time for the Regional Transportation Authority to consider changes since cash flow is down and the program may need to be consolidated.
Pima County, Federal Highway Administration	What is the extent of the traffic study? Federal Highway Administration wants to ensure the study considers roads feeding into those limits.
Tucson	Rubberized asphalt has performed well on Interstate 10, and the team may want to consider it instead of walls.

Throughout the EA process, the project team has continued to meet with elected officials, governmental staff, and intergovernmental liaisons to discuss the study and encourage their participation. Additional meetings have been held with agencies/organizations that have facilities within the study area to address property-specific concerns. For instance, team members met with PCRWRD to discuss plans for development of its properties and with Tucson Electric Power to discuss the effects of a proposed local access road on Tucson Electric Power property. In addition, specific coordination has been conducted with

applicable agencies regarding cultural resources, Section 4(f), sole source aquifer, and threatened and endangered species. Correspondence is included in Appendix B; cultural resources correspondence is in Appendix C. The proposed Build Alternative has been refined based on input received through the agency scoping and public involvement process; selected examples are described in Table 24 below.

Table 24. Examples of design refinement based on public input

Organization	Design refinement
Marana	The alignment of Starcommerce Way was modified to avoid an existing well on the southern side of Ina Road.
Tucson Electric Power	A local access road that would have divided Tucson Electric Power property and related facilities was eliminated.
Residents, Circle K	Alignment of a new east–west local access road north of Ina Road between Camino de Oeste and Camino de la Cruz has been shifted farther south to move it away from residences and to accommodate access for Circle K.
Marana	The western terminus of the Ina Road improvements was extended to be consistent with the Town of Marana’s Silverbell Road to I-10 project.
PCRWRD ^a	Access requirements of Pima County’s new Regional Optimization Management Plan facilities were accounted for in the design of the eastbound frontage road.
PCRWRD	Consideration of temporary or local access through the Ina Road treatment plant was eliminated because of security considerations.

^a Pima County Regional Wastewater Reclamation Department

B. Public Scoping and Involvement

A public scoping meeting was held on November 18, 2009, at the Tucson Chinese Cultural Center. The meeting was advertised in the *Northwest Explorer* (November 4, 2009), the *Arizona Daily Star* (November 5, 2009), and posted on the project website. A postcard invitation was also mailed to approximately 3,700 residents and businesses within a 2-mile radius of the study area. Members of the public were invited to identify issues and concerns and to provide input on the proposed project. The meeting was attended by 25 people. The meeting purpose was to introduce the project, discuss the project purpose and need, and discuss the development of project alternatives in order to obtain comments and concerns to inform the project team during the preliminary design and environmental work. Comments and questions resulting from oral and written comments included the following subjects: evaluation of traffic signal at Camino de Oeste and Ina Road, project lighting, construction of adjacent Prince Road project, construction sequencing/schedule of proposed improvements, support for grade separation of crossroad and railroad, request for information on crossroad impacts, and support for improvements.

Three property owner briefings were held with commercial and residential property owners to introduce the project and present preliminary planning information. Two meetings were held on October 4, 2010—one at the Marana Operations Center on Ina Road and the other at the Victory Worship Center on Ruthrauff Road. A letter of invitation was sent to approximately 450 residents and businesses near or adjacent to the anticipated project footprint. The Ina Road meeting was attended by 37 people and the Ruthrauff Road meeting was attended by 27 people. A third meeting was held on November 8, 2010, at the Marana Operations Center to accommodate those who were not able to attend the October 4 meeting and was attended by 27 people. A letter of invitation was sent to approximately 400 residents and businesses within, near, or adjacent to the anticipated project footprint who did not attend the first two briefings. Comments and

questions resulting from oral and written comments at all three meetings included the following subjects: future traffic on Ina Road, traffic LOS, construction schedule and sequencing, business signs, acquisition needs and process, future TI configurations and grade, TI alternative configurations, construction hours, customer access, local zoning, area of impact, future planning, compensation for loss of revenue, concerns about access impacts, signal at Camino Martin, public impacts, local access alternatives, planning schedule (public hearing), navigating local access plan, requests for more information and maps, support for improvements, and opposition to improvements.

A public information meeting was held on Thursday, March 10, 2011, at the Tucson Chinese Cultural Center. The meeting was advertised in the *Northwest Explorer* (February 23 and 24, 2011), the *Arizona Daily Star* (February 23 and 24, 2011), and posted on the project website. A newsletter was mailed to approximately 225 residents, businesses, and property owners. A postcard invitation was also mailed to approximately 19,300 residents and businesses within a 2-mile radius of the study area. Members of the public were invited to provide input on proposed alternatives and to comment on potential Section 4(f) impacts that could result from the project. The meeting was attended by 125 people. Comments and questions resulting from oral and written comments included the following subjects: evaluation of visual impacts, public input on art treatments, construction sequencing and schedule, questions and comments regarding adjacent projects, requests for information to be online, congestion, suggestion for crossroad under railroad (like Orange Grove Road), emergency vehicle access during construction, property access during construction, existing flooding concerns, traffic impacts on area operation during construction, Sunset Road connections, adverse impacts to residents, business impacts and compensation, environmental review process, concerns about cultural resources, traffic noise, light pollution, support for the project, concerns about increased flooding, suggestion to steepen crossroad to reduce access impacts, suggestion to not make improvements at Ina Road, opposition to local access plan at Ina Road, concern about property values and taxes, noise wall requests, concern about pass through traffic in neighborhoods, concern about impacts to business, request to improve Joiner Road and support railroad quiet zone, and a suggestion to reroute rail line around Tucson.

To better engage and inform businesses in the project corridor, business canvassing was conducted beginning in September 2010. Over 100 on-site visits were conducted with businesses and commercial property owners and their representatives. Follow-up phone calls and emails were also conducted.

Additional meetings have been held to meet with individual property owners or businesses to address property-specific concerns. Approximately six meetings have been held with approximately 10 businesses to discuss property-specific concerns including: decreased land value, access, visibility, ROW acquisition, traffic operation, land use, impacts to tenants and businesses, and area economic development. In addition, project information or updates have been provided to local groups as requested, such as the Marana Chamber of Commerce (October 27, 2010).

Key comments and questions and responses are addressed in Table 25.

Table 25. Public involvement comments and responses

Comment	Response
Will you address the need for a traffic light at Camino de Oeste and Ina Road?	The Build Alternative would include a traffic light at Camino de Oeste and Ina Road. Also see Part III, Section C, <i>Alternatives Considered for Further Study</i> .
Will high-mass lighting be included?	The Build Alternative would include standard ADOT ^a lighting on I-10 ^b and at key intersections. Lighting along crossroads outside ADOT right-of-way would be based on local jurisdiction standards. Also see Part III, Section C, <i>Alternatives Considered for Further Study</i> .
What is the timeline for construction at Prince Road and I-10?	Construction has commenced and should be completed in 2013.
Will you construct it all at once or will it be sequenced?	Construction would be phased for the Build Alternative, so that only one crossroad would be closed at a time. Also see Part III, Section C, <i>Alternatives Considered for Further Study</i> , for more schedule information.
Will you start at Ina Road or at Ruthrauff Road?	I-10/Ruthrauff Road is proposed for the first phase of construction under the Build Alternative. Also see Part III, Section C, <i>Alternatives Considered for Further Study</i> , for more schedule information.
Pima County master plan has trails under the freeway at washes, so the project needs to accommodate trail use.	ADOT improvements under the Build Alternative would not affect existing trails or hinder Pima County plans for future trail development along the Cañada del Oro Wash and Rillito Creek. Also see Part IV, Section F, <i>Section 4(f)</i> .
What is the extent of the traffic study?	The traffic study covers an expansive area bounded by Grant Road to the south, Cortaro Road to the north, Silverbell Road to the west, and La Cholla Boulevard/Thornycroft Road to the east.
Question whether environmental justice community has been named by executive order?	No such communities are present in the study area. Also see Part IV, Section D, <i>Title VI and Environmental Justice</i> .
Are there any impaired waters in the project area?	No impaired waters are in the study area; however, the study area is within a sole source aquifer. Also see Part IV, Section K, <i>Water Resources</i> .
Suggestion to contact ADEQ ^c regarding WQARF ^d site at El Camino del Cerro landfill. District forwarded information regarding the El Camino del Cerro WQARF site.	The WQARF site has been reviewed in the hazardous materials analysis. Construction activities of the Build Alternative have the potential to interact with the site, and this issue was addressed with ADEQ in conjunction with the sole source aquifer. Also see Part IV, Section K, <i>Water Resources</i> , and Section O, <i>Hazardous Materials</i> .
Claims cultural affiliation to prehistoric cultural groups in Arizona, supports identification and avoidance of prehistoric archaeological sites and traditional cultural properties, including archaeological sites of Hopi ancestors, and recommended early archaeological coordination and continuing consultation.	A Class I Archaeological Assessment was prepared and consulted on with affected parties, including tribes. The report recommends testing and data recovery, which would include continuing coordination. Also see Part IV, Section E, <i>Cultural Resources</i> .
Rubberized asphalt has performed well on I-10 and the team may want to consider it instead of walls.	Rubberized asphalt may be considered by ADOT; however, it is not considered allowable as mitigation by FHWA. ^d Walls are still evaluated where applicable to meet FHWA requirements. Also see Part IV, Section H, <i>Noise Levels</i> .
Please separate the road and train traffic at Ruthrauff Road and the other crossings.	The Build Alternative would separate these crossroads from I-10 and railroad traffic by raising the crossroad above these facilities. Also see Chapter III, Section C, <i>Alternatives Considered for Further Study</i> .

^a Arizona Department of Transportation ^b Interstate 10 ^c Arizona Department of Environmental Quality ^d Federal Highway Administration

C. Public Hearing

Agencies and members of the public are invited to review and comment on the draft EA. A public hearing on the draft EA will be held during the 30-day comment period. A copy of the notice of public hearing is included in Appendix D. Comments received during the final comment period will be considered in the final decision.

VI. Conclusion

Table 26 summarizes the potential environmental impacts associated with the Build Alternative and the No Action Alternative and summarizes mitigation proposed for the Build Alternative to reduce impacts.

Table 26. Summary of environmental assessment process

Environmental consideration	Build Alternative	No Action Alternative	Mitigation for the Build Alternative
Land ownership, jurisdiction, and land use (see page 31)	Convert approximately 23.58 acres of commercial, municipal, residential, and park uses to transportation use	No impacts	Acquisition consistent with the Uniform Act ^a
Social and economic considerations (see page 33)	Displacement of 2 residences, 13 commercial properties, and 1 municipal property Partial acquisition/encroachment for 52 properties Encroachment and change in access for businesses Elimination of traffic/emergency delays from railroad crossing Improved level of service, traffic operation, and emergency access Congestion and closures during construction	No acquisitions or displacements No change in access or encroachment Continuing congestion, poor level of service Continued traffic and emergency delay for at-grade railroad crossings No construction impacts	Acquisition consistent with the Uniform Act (page 26) Completion of local access improvements prior to traffic interchange closure Continued access during construction Traffic control coordinated with public safety and transportation agencies
Title VI and environmental justice (see page 43)	No disproportionate adverse impacts on study area populations anticipated Benefits and adverse impacts would accrue proportionally to all populations	No impacts	None applicable
Cultural resources (see page 50)	Significant archaeological deposits are likely to be uncovered Historic road segment would be replaced with modern road; historic railroad alignment would be spanned by crossroads No NRHP ^b -eligible architectural properties, historic districts, or subdivisions would be affected	No impacts	Archaeological testing and data recovery Cessation of work when cultural resources are encountered Compliance with Programmatic Agreement
Section 4(f) (see page 54)	<i>De minimis</i> impacts to Mike Jacob Sports Park and historic railroad alignment would result	No impacts	Replacement of lost parking and landscaping Continued access to parks and trails during construction
Air quality (see page 57)	Short-term air quality impacts during construction Overall air quality would be improved as a result of congestion relief	No construction impacts No air quality improvement	Contractor would control, reduce, remove, or prevent air pollution during construction Compliance with state laws on air quality ^c

(continued on next page)

Table 26. Summary of environmental assessment process (continued)

Environmental consideration	Build Alternative	No Action Alternative	Mitigation for the Build Alternative
Noise levels (see page 62)	Temporary noise during construction A 0- to 6-dBA ^d increase in traffic noise levels by 2040; several properties would experience a 1- to 5-dBA reduction in noise levels from existing levels	No construction noise impacts A 2- to 4-dBA increase in traffic noise levels by 2040	Update of noise analysis based on final design Implementation of standard specifications for noise control during construction
Utilities and railroads (see page 68)	Existing utilities would need to be relocated Grade separation with railroad	No utility impacts At-grade crossing with railroad would continue	Coordination with affected utilities Plan review by Union Pacific Railroad Customer notification of service interruptions
Visual resources (see page 70)	Change in freeway views Increase in traffic interchange elevation Localized view changes (realigned intersections, new connector roads, introduction of retaining walls)	No impacts	Architectural and landscape treatments
Water resources (see page 72)	Project activities during construction have the potential to affect surface and groundwater	No impacts	Compliance with Sections 404 and 401 of the Clean Water Act Use of best management practices and implementation of a Stormwater Pollution Prevention Plan to comply with the Safe Drinking Water Act, sole source aquifer requirements, and Section 402 of the Clean Water Act
Drainage and floodplains (see page 80)	Introduction of new structures into the floodplain; but would not increase floodplain elevation	No impacts	Floodplain managers' review of final plans
Vegetation and invasive species (see page 83)	Minor removal of native vegetation Potential to introduce invasive species through construction activities	No impacts	State notification regarding native plant removal Native seeding of disturbed soils Invasive species controls
Threatened and endangered species, designated critical habitat, and sensitive species (see page 85)	May affect native plants and potential burrowing owl habitat	No impacts	Preconstruction survey for burrowing owl; avoidance or relocation

(continued on next page)

Table 26. Summary of environmental assessment process (continued)

Environmental consideration	Build Alternative	No Action Alternative	Mitigation for the Build Alternative
Hazardous materials (see page 88)	Deep borings during construction may contact groundwater contamination Sites within or adjacent to project limits have the potential to contain contaminants Construction would involve demolition of structures that may contain lead or asbestos	No impacts	Additional assessment of properties for acquisition Lead and asbestos testing/abatement Cessation of work if suspicious materials exposed Implementation of a CMMP ^e for work interacting with contaminated groundwater plume NESHAP ^f notification for structure demolition
Material sources and waste materials (see page 92)	Approximately 500,000 cubic yards of fill material would be needed	No impacts	Review and approval of materials source sites prior to use Controls for disposal of materials
Secondary impacts (see page 93)	Minor, positive impacts on air quality and railroad operation Moderate, positive impacts on land use and socioeconomics Moderate, negative impacts on noise	Minor, neutral impacts on land use, air quality, and railroad operation Moderate, negative impacts on socioeconomics and noise levels	None applicable
Cumulative impacts (see page 94)	Neutral impacts on land use Positive impacts on socioeconomics and air quality Minor negative impacts on cultural resources and noise	No impacts on cultural resources Neutral impacts on land use, socioeconomics, air quality, and noise	None applicable

^a Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970

^b National Register of Historic Places

^c Arizona Revised Statutes § 49-401 et seq. on air quality; Arizona Administrative Code, Title 18, Chapter 2 on Air Pollution Control

^d A-weighted decibel

^e Contaminated Media Management Plan

^f National Emissions Standards for Hazardous Air Pollutants

A. Preferred Alternative

The Build Alternative would meet the project purpose and need, was developed and refined based on agency and public input and environmental consideration, and is considered feasible. Based on these considerations, the Build Alternative is the Preferred Alternative.

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