# INTERSTATE 10/KORTSEN ROAD TRAFFIC INTERCHANGE

# Environmental Overview Draft Technical Memorandum

March 31, 2014

Prepared by

JACOBS

# Environmental Overview

## Draft Technical Memorandum

### Interstate 10/Kortsen Road Traffic Interchange

**CG Contract 713-5**

**PREPARED FOR:**
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Casa Grande, AZ 85122

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## List of Acronyms and Abbreviations

| | |
|---|---|
| ACS | American Community Survey |
| ADEQ | Arizona Department of Environmental Quality |
| ADOT | Arizona Department of Transportation |
| ADWR | Arizona Department of Water Resources |
| AGFD | Arizona Game and Fish Department |
| amsl | above mean sea level |
| APE | area of potential affect |
| ARS | Arizona Revised Statutes |
| ASLD | Arizona State Land Department |
| ASM | Arizona State Museum |
| BLM | Bureau of Land Management |
| CAA | Clean Air Act |
| Casa Grande | City of Casa Grande |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| Corps | U.S. Army Corps of Engineers |
| dBA | A-weighted decibel |
| EO | Environmental Overview |
| EPA | U.S. Environmental Protection Agency |
| FEMA | Federal Emergency Management Agency |
| FIRM | Flood Insurance Rate Map |
| FHWA | Federal Highway Administration |
| FPPA | Farmland Protection Policy Act |
| I-10 | Interstate 10 |
| LUST | leaking underground storage tank |
| MBTA | Migratory Bird Treaty Act of 1918 |
| MSATs | mobile source air toxics |
| NAAQS | National Ambient Air Quality Standards |
| NAC | Noise Abatement Criteria |
| NAP | Noise Abatement Policy |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| $NO_2$ | nitrogen dioxide |
| $NO_x$ | nitrogen oxides |
| NRCS | Natural Resources Conservation Service |
| NRHP | National Register of Historic Places |
| $O_3$ | ozone |
| Pb | lead |

| | |
|---|---|
| $PM_{10}$ | particulate matter less than 10 microns in diameter |
| $PM_{2.5}$ | particulate matter less than 2.5 microns in diameter |
| RCRA | Resource Conservation and Recovery Act |
| ROW | right-of-way |
| SHPO | State Historic Preservation Office |
| $SO_2$ | sulfur dioxide |
| SR | State Route |
| U.S. | United States |
| U.S.C. | United States Code |
| USFS | U.S. Forest Service |
| USFWS | U.S. Fish and Wildlife Service |
| UST | underground storage tank |

# Introduction

## *Purpose of an Environmental Overview*

The Environmental Overview (EO) describes the existing environment (i.e., the existing physical, natural, and socioeconomic environments). The EO also identifies potential environmental issues associated with the proposed City of Casa Grande (Casa Grande) Interstate 10 (I-10)/Kortsen Road Traffic Interchange study area. The EO is intended to contribute to decision-making at the Alternatives Analysis stage of the National Environmental Policy Act (NEPA) process. The EO identifies, early in the planning process, the issues, constraints, and opportunities that are to be considered in the preliminary analysis of alternatives. Information presented herein is based on existing records review, local jurisdiction and regulatory agency coordination, and limited field review. Detailed impact analysis of alternatives carried into further study as part of the NEPA process will occur upon completion of the Alternatives Analysis process. That set of analyses will build off the information presented herein as appropriate.

## *Project Need*

Pinal County is a rapidly growing county with a population that has more than doubled since the 2000 census estimate of 179,727 persons. The estimated population in 2010 was 375,770 and the county population increased by 3.1 percent by 2012 to a total estimated population of 387,365 (U.S. Census Bureau 2014a). With most of the county under the ownership or administration of state and federal agencies or Native American tribes, most of the development is occurring on privately owned land, which is primarily located in and near established communities such as Casa Grande, Coolidge, Florence, Apache Junction, and Globe.

This rapid growth and development includes the I-10 corridor on the eastern side of Casa Grande; this EO focuses on the I-10 corridor generally between McCartney Road and State Route (SR) 287 (see Figures 1 and 2). Development of the Phoenix Mart and residential subdivisions within the vicinity of the study area are expected to generate significant traffic that will potentially require an alternate access to and from I-10. Phoenix Mart, a 1.75-million-square-foot business-to-business sourcing center for manufacturers and distributors to showcase their products, is under development east of Overfield Road between Florence Boulevard and Cottonwood Lanes in Casa Grande, Arizona. Many planned housing developments have been built within the study area in the last 20 years, with most of that development occurring in the most recent decade.

The purpose of the study is to increase the mobility and connectivity along I-10 in eastern Casa Grande. This will address the capacity issues associated with increasing demand for access to and from I-10 resulting from Phoenix Mart and other future development in the Florence Boulevard corridor and in eastern Casa Grande.

**Figure 1 Study Location**

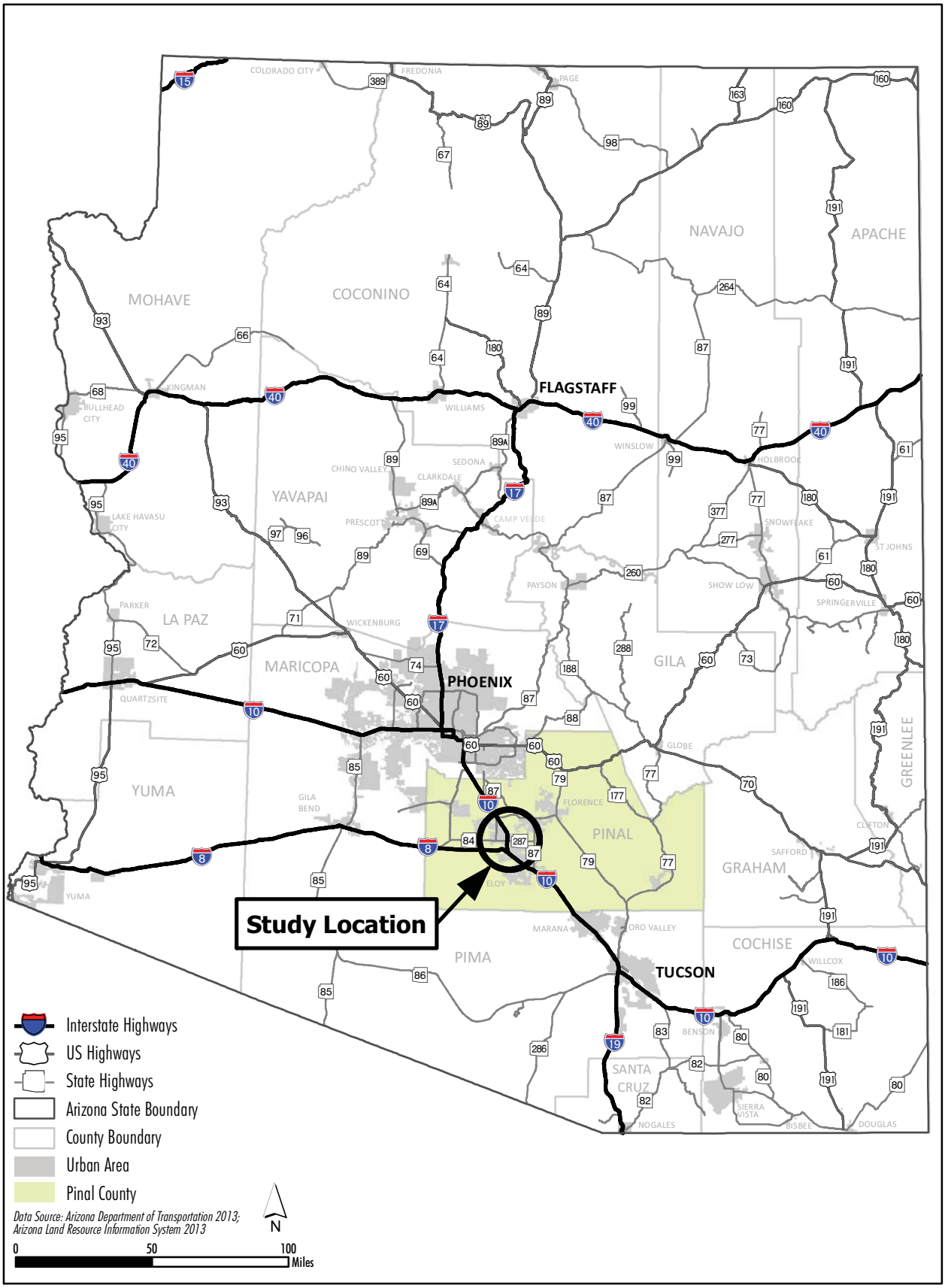
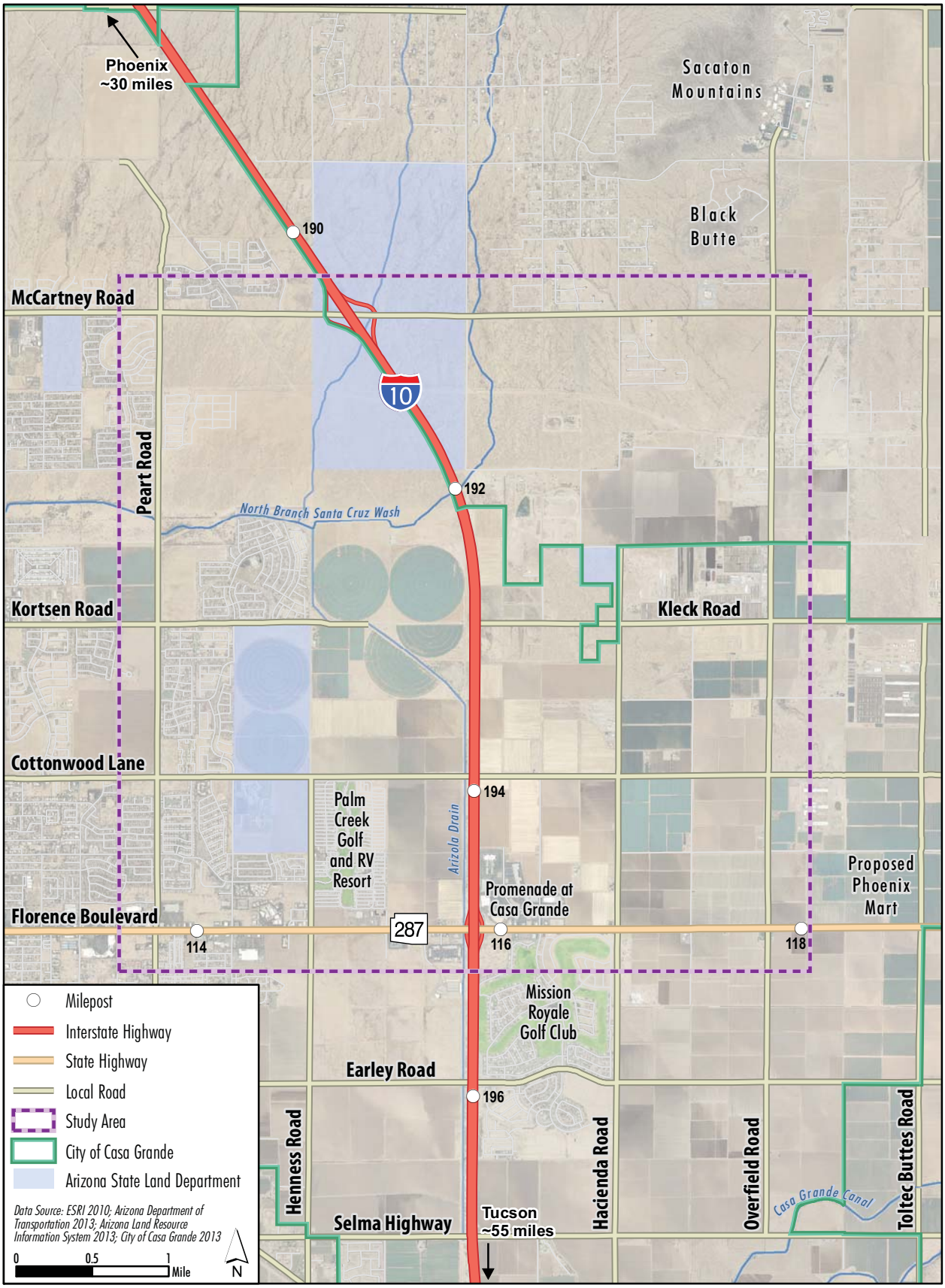


**Figure 2 Study Area**



### *Project Scope*

The study area is generally bounded by McCartney Road on the north, Overfield Road on the east, SR 287 (also known as Florence Boulevard) on the south, and Peart Road on the west.

Construction of a traffic interchange and the widening of connecting roadways would likely require the acquisition of land for rights-of-way (ROWs). Where the needed land includes existing infrastructure, such as utilities, sidewalks, or drainage features, the design would need to account for avoiding, modifying, or relocating these features. Earthwork activities are another construction-related consideration, including the potential import of fill materials for ramps. Native vegetation, landscape vegetation, or planted crops may be removed within the ROW limits during construction; actions may be taken to mitigate the loss, such as compensating for crop losses or salvaging protected native plants for use in post-construction rehabilitation efforts. The analysis presented in this EO describes potential concerns based on the existing resources in the study area.

The study area is approximately 4.5 miles in length by 4.5 miles in width, encompassing a total of about 20 square miles. The EO accounts for adjacent resources when applicable. It is anticipated that the studies being conducted will identify proposed alternatives within the study area to increase mobility and connectivity on both sides of the I-10 corridor.

## Affected Environment and Environmental Concerns

The EO describes the natural and built environment within the overall study area by resource topic. The discussion for each topic concludes with environmental concerns and recommendations for additional analysis and coordination. Some resource topics are purposefully omitted. Based on a review of available information, no sole source aquifers, outstanding Arizona waters, impaired waters, or wild and scenic rivers are present in the study area (U.S. Environmental Protection Agency [EPA] 2014b, Arizona Department of Environmental Quality [ADEQ] 2012, and National Wild and Scenic Rivers 2014). Therefore, the EO does not discuss these resources further.

### *Physical and Natural Environment*

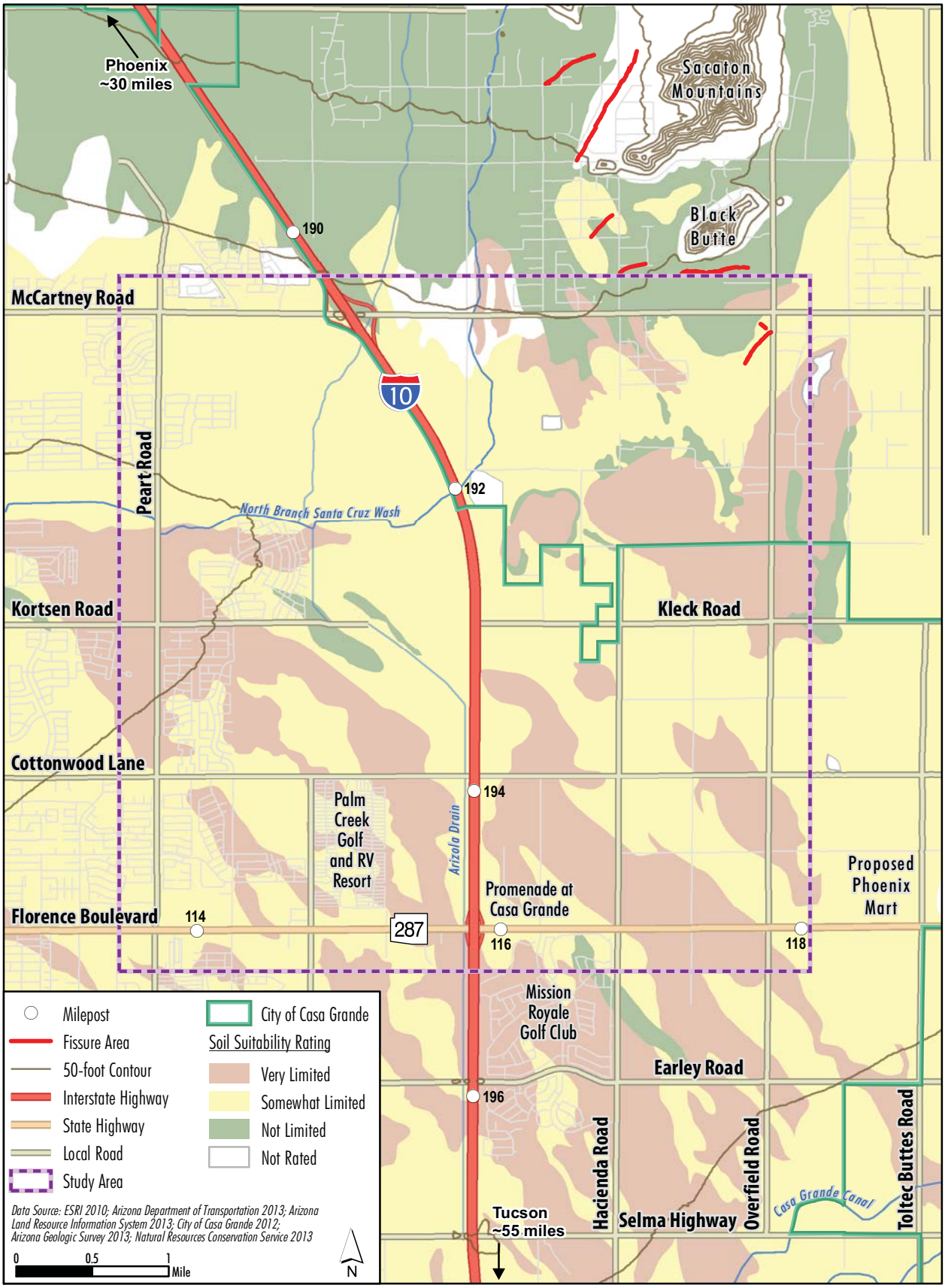
#### Topography/Physiography

##### *Affected Environment*

The study area is at approximately 1,400 feet above mean sea level (amsl) in the western portion of Pinal County, Arizona. The terrain is generally flat to gently sloping to the north and west.

Soils in the study area include Casa Grande fine sandy loam, Mohall sandy loam, and Ginland clay. These are well-drained, very deep, fine to medium coarse-textured soils on nearly level ground. These soils occur on relic basin floors and fan terraces, with slopes of 0 to 5 percent. These soils, which were formed in stratified stream or fan alluvium, derived from igneous and sedimentary rocks (Natural Resources Conservation Service [NRCS] 2011). As shown on Figure 3, only 5.8 percent of the soils in the study area offer a natural surface that would be suited for road construction without limitations. Approximately 61.1 percent of the soils in the study area would be somewhat limited in their suitability

**Figure 3 Fissures and Soil Suitability**



as a natural surface for road construction and 32.5 percent of the soils would be very limited in their suitability (NRCS 2014). Additional information on soil suitability is included in Appendix A.

Fissures are longitudinal gaps in the earth's surface associated with extensive groundwater declines. They may be more than one mile in length, up to 15 feet wide, and hundreds of feet deep. During torrential rains, fissures can erode rapidly, cause ground subsidence, and present substantial hazards to people and infrastructure. As shown on Figure 3, fissures are nearly absent in the study area with the exception of minimal fissure activity in the northeastern corner. The most concentrated area of fissures in the region is generally more than 3 miles south of the study area. The nearest recorded subsidence is also in this same area, near where I-10 approaches Interstate 8.

Similarly to the minimal fissuring in the study area, there are few washes in the study area. Because most of the study area has been modified for agricultural production and a mix of rural and urban development, drainage and washes are mostly confined to the undeveloped part of the study area in the north.

#### *Environmental Concerns and Recommendations for Further Analysis*

The topography and soils in study area:

- Are mostly somewhat limited or very limited in their suitability as a natural surface for construction of new traffic interchange.
- Do not contribute necessarily to establishing differences among possible alternatives that may occur in the study area except to the extent that the soils with very limited suitability can be avoided.

The drainage crossings would not likely pose any unusual construction challenges, require any unique construction methodologies, or contribute substantially to differentiating between alternatives. A drainage study would be prepared in support of the Design Concept Report. Pipes, culverts, or bridges are typical design features used to accommodate cross-drainage as necessary. In addition, a geotechnical study would be prepared to determine pavement, slope protection, and structural needs.

Topography and soils would not be a critical factor when screening and comparing alternatives.

### Native Vegetation/Plant Communities

#### *Affected Environment*

The study area occurs within the Lower Colorado River Valley subdivision of the Sonoran desertscrub biotic community per Turner and Brown (1994). This subdivision is the driest of the Sonoran Desert subdivisions, resulting from a combination of high annual temperatures and low annual precipitation (Turner and Brown 1994). Creosote bush (*Larrea tridentata*), is the dominant native vegetation species in this plan subdivision. Other common perennial plant species characteristic of this community, although not necessarily present within the study area, include cat-claw acacia (*Acacia greggii*), burrobush (*Hymenoclea salsola*), desert broom (*Baccharis sarothroides*), velvet mesquite (*Prosopis velutina*), ironwood (*Olneya tesota*), ocotillo (*Fouquieria splendens*), brittlebush (*Encelia farinosa*), blue paloverde (*Parkinsonia florida*), foothills paloverde (*P. microphylla*), and saguaro (*Carnegeia gigantea*). Surveys focused on native plants and invasive species were not conducted as part of this overview.

A windshield survey of the study area was conducted in February 2014. Most of the study area has been previously disturbed either by agricultural practices, residential and commercial development, or associated infrastructure. Native vegetation generally is limited to scattered patches within the northern portion of the study area. These patches of native vegetation typically exhibit limited species diversity; however, greater diversity is typically present along ephemeral drainages.

*Environmental Concerns and Recommendations for Further Analysis*

The native plant communities in the study area:

- Do not pose any particular limitations on or unique requirements for construction of a transportation facility.
- Do not present any unique physical attributes that may warrant special consideration not typically accounted for on this type of study. For example, coordination with the Arizona Department of Agriculture is recommended to arrange for proper treatment of disturbed native plants per state regulations.
- May contribute to establishing differences among possible alternatives that may occur in the study area. Particularly, alternatives that would pass through the more sensitive native plant communities may generate greater impacts than alternatives that would pass through agricultural or other disturbed areas.

It is recommended that future transportation alternatives avoid designated areas with native vegetation or plant communities per guidelines in the various comprehensive, open space, and recreation plans adopted by Pinal County and Casa Grande (reference the Land Use, Ownership, and Jurisdiction section for a full list). Future easements from the Arizona State Land Department (ASLD) would require a native plant salvage plan or stumpage fees. Further surveys for protected native plants (as defined by the Arizona Department of Agriculture) and invasive species may be required during future environmental analyses in order to address potential concerns. Overall, potential differences in impacts on native vegetation and plant communities should be addressed when screening and comparing alternatives.

## Biology/Wildlife

The following section is divided into four subsections: threatened and endangered species, other special status species, migratory birds, and wildlife movement corridors and linkages. These subsections provide an overview of the affected environment and environmental concerns related to plant and wildlife habitat. A windshield survey of the study area was conducted in February 2014. In addition, background research for the study area was performed prior to field surveys and included information from the U.S. Fish and Wildlife Service (USFWS) and the Arizona Game and Fish Department (AGFD).

*Affected Environment*

### Threatened and Endangered Species

A list of federal endangered, threatened, proposed, and candidate species for Pinal County was obtained from USFWS and reviewed by Theresa Price, a qualified biologist at AMEC Environment & Infrastructure, Inc., to determine which listed species may occur within and adjacent to the study area (USFWS 2013). According to USFWS, 13 endangered species, 1 threatened species, and 5 proposed or candidate species have the potential to occur in Pinal County (USFWS 2013). Table 1 lists the status of each and the

presence or absence of suitable habitat. Suitable habitat within the study area was determined by evaluating each species' habitat requirements, field observations during the windshield survey, and spatial occupancy data gathered from AGFD's online HabiMap program (AGFD 2013a).

**Table 1 USFWS-Listed Species in Pinal County, Arizona and Habitat Description**

| Common Name *Scientific Name* | Federal Status | Habitat Description | Suitable Habitat Present? | Critical Habitat Present? |
|---|---|---|---|---|
| **Birds** | | | | |
| Yellow-billed cuckoo *Coccyzus americanus* | Proposed Threatened | Large blocks of dense, wooded, streamside habitat (cottonwood, willow or tamarisk galleries) at elevations at or below 6,500 feet amsl. | No | No |
| Mexican spotted owl *Strix occidentalis lucida* | Threatened | Canyons of dense forests and typically older forests of mixed conifer or ponderosa pine/gambel oak type. Sites with cool microclimates appear to be of importance or are preferred; however, this species will use a variety of habitats for foraging. | No | No |
| Southwestern willow flycatcher *Empidonax traillii extimus* | Endangered | Cottonwood-willow riparian habitats, open second-growth shrub thickets, swamps, and open woodlands. Breed locally along the Colorado and Little Colorado rivers; along the middle Gila, Salt, and Verde rivers; the middle to lower San Pedro River; and the upper San Francisco River in Arizona. | No | No |
| Yuma clapper rail *Rallus longirostris yumanensis* | Endangered | Dense emergent riparian vegetation with a wet substrate (mudflat, sandbar) and dense herbaceous or woody vegetation for nesting and foraging. | No | No |
| **Mammals** | | | | |
| Lesser long-nosed bat *Leptonycteris curasoae yerbabuenae* | Endangered | Desertscrub where agave and columnar cacti are present. Roosting often occurs in caves and abandoned tunnels. Foraging typically occurs on nectar, pollen, and fruit of paniculate agaves and columnar cacti. Present in Arizona usually from April to September. | No | No |
| Ocelot *Leopardus pardalis* | Endangered | Desertscrub areas with dense overhead cover. | No | No |

**Table 1 USFWS-Listed Species in Pinal County, Arizona and Habitat Description**

| Common Name *Scientific Name* | Federal Status | Habitat Description | Suitable Habitat Present? | Critical Habitat Present? |
|---|---|---|---|---|
| **Reptiles** | | | | |
| Sonoran desert tortoise *Gopherus morafkai* | Candidate | Rocky (often steep) hillsides and bajadas of Sonoran desertscrub. Washes and valley bottoms may be useful in dispersal. | Yes | No |
| Tucson shovel-nosed snake *Chionactis occipitalis klauberi* | Candidate | Creosote-mesquite floodplain areas of Sonoran desertscrub containing soft, sandy soils with sparse to low gravel content. | Yes | No |
| Northern Mexican gartersnake *Thamnophis eques megalops* | Proposed Threatened | Large-river riparian woodlands and forests, streamside gallery forests, and areas nearby cienegas or stock tanks. Strongly associated with the presence of a native prey base including leopard frogs and native fish. | No | No |
| **Fish** | | | | |
| Roundtail chub *Gila robusta* | Candidate | Deep pools and eddies of large streams and rivers at elevations between 1,000 and 7,500 feet amsl. Found within the upper and lower Colorado, Little Colorado, Bill Williams and Gila river basins. | No | No |
| Desert pupfish *Cyprinodon macularius* | Endangered | Desert springs and marshes, lakes, backwaters, stream pools, and saline pools with sand or silt substrates and water less than 1 meter in depth. | No | No |
| Gila chub *Gila intermedia* | Endangered | Pools, springs, cienegas, and streams typically ranging from 2,000 to 5,000 feet amsl. | No | No |
| Gila topminnow *Poeciliopsos occidentalis occidentalis* | Endangered | Small streams, springs, and cienegas, vegetated shallows below 4,500 feet amsl. | No | No |
| Loach minnow *Tiaroga cobitis* | Endangered | Small to large perennial streams with swift shallow water over cobble and gravel. Recurrent flooding and a natural hydrograph are important habitat elements. | No | No |

**Table 1 USFWS-Listed Species in Pinal County, Arizona and Habitat Description**

| Common Name *Scientific Name* | Federal Status | Habitat Description | Suitable Habitat Present? | Critical Habitat Present? |
|---|---|---|---|---|
| Razorback sucker *Xyrauchen texanus* | Endangered | Backwaters, flooded bottomlands, pools, side channels and other slower-moving waters below 6,000 feet amsl. Natural populations exist in Lake Mohave, Lake Mead, and Lake Havasu. | No | No |
| Spikedace *Meda fulgida* | Endangered | Medium to large perennial streams with moderate to swift velocity waters over cobble and gravel substrate. Recurrent flooding and a natural hydrograph are important habitat components. | No | No |
| **Plants** | | | | |
| Acuña cactus *Echinomastus erectocentrus* var. *acunensis* | Endangered | Well-drained knolls and gravel ridges in Sonoran desertscrub, typically ranging from 1,100 to 3,800 feet amsl. | Yes | No |
| Arizona hedgehog cactus *Echinocereus triglochidiatus* var. *arizonicus* | Endangered | Open slopes, in narrow cracks between boulders, or in understory of shrubs in ecotone between interior chaparral and madrean evergreen woodland, at elevations between 3,200 and 5,200 feet amsl. | No | No |
| Nichol Turk's head cactus *Echinocactus horizonthalonius* var. *nicholii* | Endangered | Unshaded microsites in Sonoran desertscrub on dissected alluvial fans at the foot of limestone mountains and on inclined terraces and saddles on limestone mountain sides, typically between 2,400 and 4,100 feet amsl. | No | No |

Sources: USFWS 2013 (Effective List Date: October 30, 2013); NatureServe 2014.

As indicated in Table 1, no USFWS-designated critical habitat is located within the study area. The AGFD HabiMap identified suitable habitat for Yuma clapper rail, western yellow-billed cuckoo, and long-nosed bat; however, observations made during the windshield survey and review of aerial photographs did not indicate likely habitat for these species within the study area. Suitable habitat within the study area may occur for Tucson shovel-nosed snake, Sonoran desert tortoise, and Acuña cactus.

### Other Special Status Species

The AGFD Heritage Data Management System Online Environmental Review Tool (AGFD 2013b) was accessed to determine other special status species known to occur in or near the study area. As listed in Table 2, AGFD identified two special status species as occurring within 3 miles of the study area: western burrowing owl (*Athene cunicularia hypugaea*) and western yellow bat (*Lasiurus xanthinus*).

**Table 2 Other Special Status Species Potentially Occurring in the Study Area**

| Common Name *Scientific Name* | Federal Status | Habitat Description | Suitable Habitat Present? |
|---|---|---|---|
| Western burrowing owl *Athene cunicularia hypugaea* | Species of Concern: USFWS; Sensitive: USFS, BLM | Variable in open, well-drained grasslands, steppes, deserts, prairies, and agricultural lands. Often associated with burrowing mammals. Burrowing owls are also observed in open areas such as vacant lots near human habitation, golf courses, and airports. | Yes |
| Western yellow bat *Lasiurus xanthinus* | Sensitive: USFS; Wildlife of Special Concern: AGFD | Preferred habitat not clearly understood; however, often associated with palm trees and broad-leaved deciduous trees such as sycamores and cottonwoods that provide roost sites. Have also been observed utilizing hackberries. | No |

Sources: AGFD 2001; 2011.
AGFD = Arizona Game and Fish Department
BLM = Bureau of Land Management
USFS = U.S. Forest Service
USFWS = U.S. Fish and Wildlife Service

### Migratory Birds

Birds protected under the Migratory Bird Treaty Act of 1918 (MBTA) include all common songbirds, raptors, waterfowl, shorebirds, seabirds and wading birds. The MBTA states it is unlawful to take, kill, or possess migratory birds that are listed under its protection. Protection is provided for the birds, their nests, and eggs.

The Western burrowing owl (*Athene cunicularia hypugaea*) is federally protected under the MBTA and is listed as a USFWS Species of Concern, but is not provided protection under the Endangered Species Act. Threats to burrowing owls include habitat loss due to development, degradation, and fragmentation; predation; illegal shooting; and pesticides. The primary threat appears to be the eradication of burrowing rodents through control programs. Burrowing owls occur in arid, open habitats including grasslands, deserts, and prairies. They may also use constructed landscapes such as golf courses, airports, and agricultural fields (AGFD 2001).

### Wildlife Movement Corridors and Linkages

The movement of wildlife through the study area depends on the availability of preferred habitat, foraging range, migration, and dispersal patterns. Many resident birds and terrestrial wildlife species find that limited cover, altered habitat, and the presence of structures and roadways in developed areas present a barrier to movement. For these species, wildlife corridors include gaps in development where animals are funneled between patches of preferred habitat.

The potential traffic, noise, and walls in the study area could pose a barrier for many large mammals and other terrestrial species. The Arizona Wildlife Linkages Workgroup (2006) and *Pinal County Wildlife Connectivity Assessment* (AGFD 2013c) have identified known and potential wildlife corridors and have

assessed wildlife linkages around the state, classifying areas as habitat blocks, potential linkage zones, or fracture zones. The study area is located within a fracture zone. As illustrated on Figure 4, the study area is bisected by I-10, which is considered a major barrier to wildlife movement.

Wildlife may use undeveloped areas as movement corridors with relatively little disturbance because of the isolation from human disturbances. Natural drainage channels crossing the study area, such as the North Branch of the Santa Cruz Wash and small ephemeral washes in the northern portion of the study area, can act as wildlife corridors. In some of these washes, habitat complexity and topographic relief provided by the drainage channels and adjacent xeroriparian vegetation may serve to direct wildlife through adjacent developed or open terrain (see Figure 4). Potentially affected wildlife associated with these wildlife corridors include javelina (*Tayassu tajacu*), coyote (*Canis latrans*), and possibly kit fox (*Vulpes macrotis*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*) and skunks (family *Mephitidae*). These wildlife species may traverse and forage in the undeveloped space and wash corridors in the study area.

### *Environmental Concerns and Recommendations for Further Analysis*

The study area is largely developed, exhibiting mostly agriculture and residential development. Because of its developed nature, the study area generally does not offer prime habitat for native plant and animal wildlife. However, remnants of suitable habitat for native plants and wildlife do exist in the fragmented open space in the northern portion of the study area.

Construction within the study area may have the potential to affect the plants and wildlife identified in the USFWS threatened and endangered species list or the AGFD special status species list. During the NEPA process, development of a detailed Biological Evaluation is recommended to determine the specific presence/absence of protected species and potential mitigation measures. Impacts to protected species could result in some level of Section 7 consultation with USFWS. Further coordination with USFWS, AGFD, and Pinal County would also be needed.

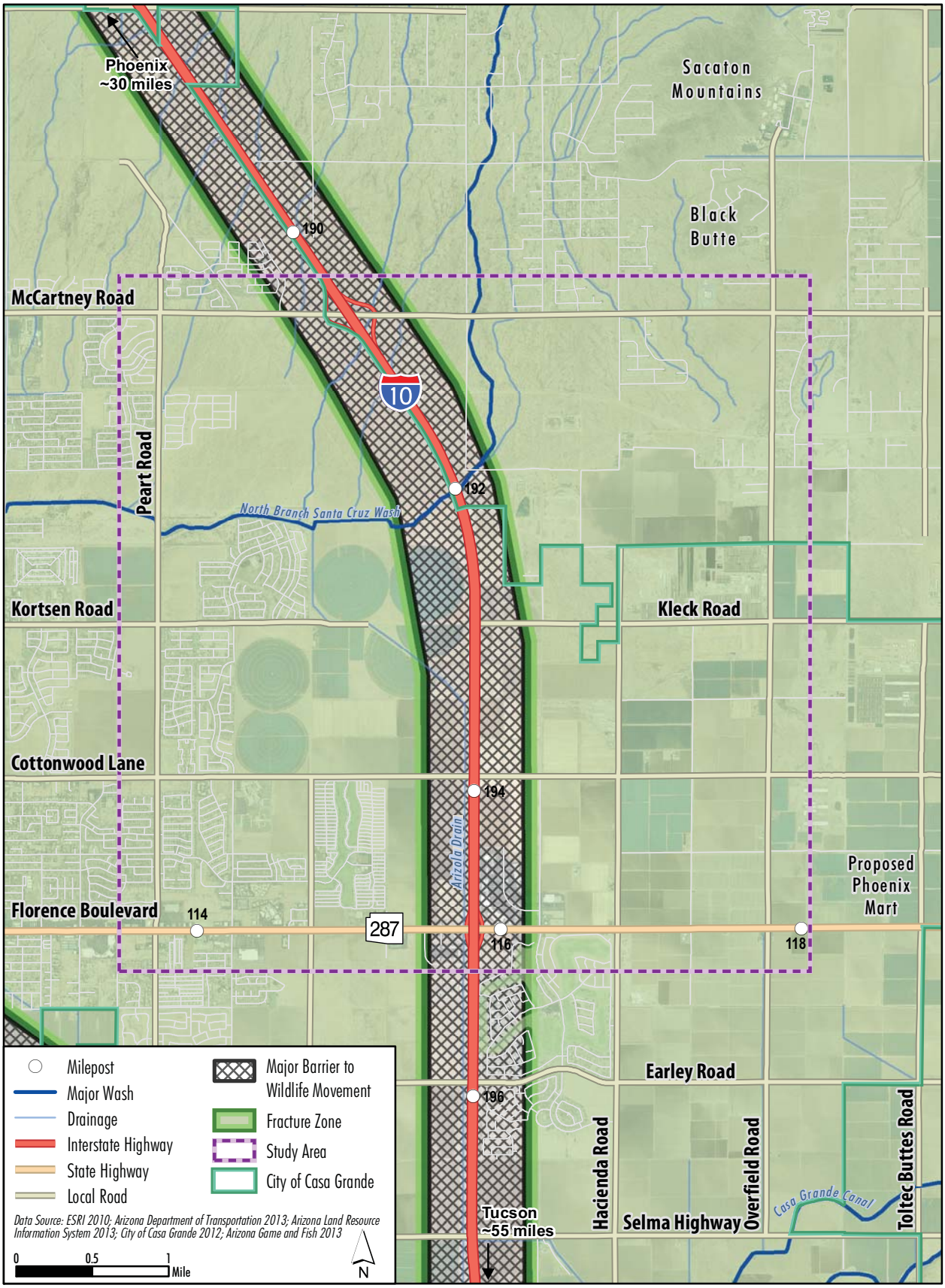
Pinal County considers the protection of critical habitat and the promotion of wildlife linkages as viable means to promoting environmental stewardship and preserving ecological integrity (Pinal County 2009). If project activities were expected to affect biological resources within the study area, further studies identifying habitat and surveying for protected species would be necessary to design conservation strategies for implementation in the project design. Survey protocols are currently available for Western burrowing owl and Sonoran desert tortoise on AGFD's website.

With respect to wildlife, the study area:

- Does not contain any designated critical habitat for USFWS listed threatened or endangered species.
- Contains suitable habitat for Tucson shovel-nosed snake, Sonoran desert tortoise, Acuña cactus, and Western burrowing owl.
- Is bisected by I-10, which is considered a major barrier to wildlife movement.
- Does not contain or lie within any habitat blocks or potential wildlife connectivity linkage zones.

Overall, potential differences in impacts on suitable wildlife habitat and connectivity should be included in the criteria used to screen and compare alternatives.

**Figure 4 Wildlife Barriers and Washes**



## Hydrology

Beyond initially defining drainages in the study area, the following section is divided into three subsections, wetlands and floodplains, water quality, and wells. These subsections establish and define the affected environment and environmental concerns related to hydrology.

### *Affected Environment*

The natural drainages in the study area are ephemeral, flowing northwest to the Gila River. As shown on Figure 5, the North Branch of the Santa Cruz Wash, which is also ephemeral, passes through the northwest portion of the study area, crossing I-10 at milepost 192, and is the only major wash in the study area. The Arizola Drain is a man-made flood control feature that drains flood water from the North Branch of the Santa Cruz Wash south and east before running parallel to the west side of I-10 within the study area.

### Wetlands and Floodplains

Executive Order 11990, Protection of Wetlands, and Executive Order 11988, Floodplain Management, require federal agencies to avoid long- and short-term adverse impacts to wetlands and floodplains to the extent possible, as well as to avoid direct and indirect support of wetland and floodplain development wherever there is a practicable alternative.

As shown on Figure 5, a review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panels shows FEMA-mapped 100-year floodplains present in the study area (FEMA 2007). The floodplains are associated with the North Branch of the Santa Cruz Wash in the northwest portion of the study area and the Arizola Drain.

Figure 5 shows the locations of approximately 10 potential wetlands identified in the National Wetlands Inventory database. The database describes most of these as public freshwater ponds, although one, a wetland on a dairy located north of Kleck Road and west of Overfield Road, is referred to as a lake (defined as a lacustrine littoral unconsolidated shore). The ponds are generally associated with housing developments, golf courses, or may have been associated with irrigation practices. If these potential wetlands are not associated with a wash or drainage, they may not be jurisdictional.

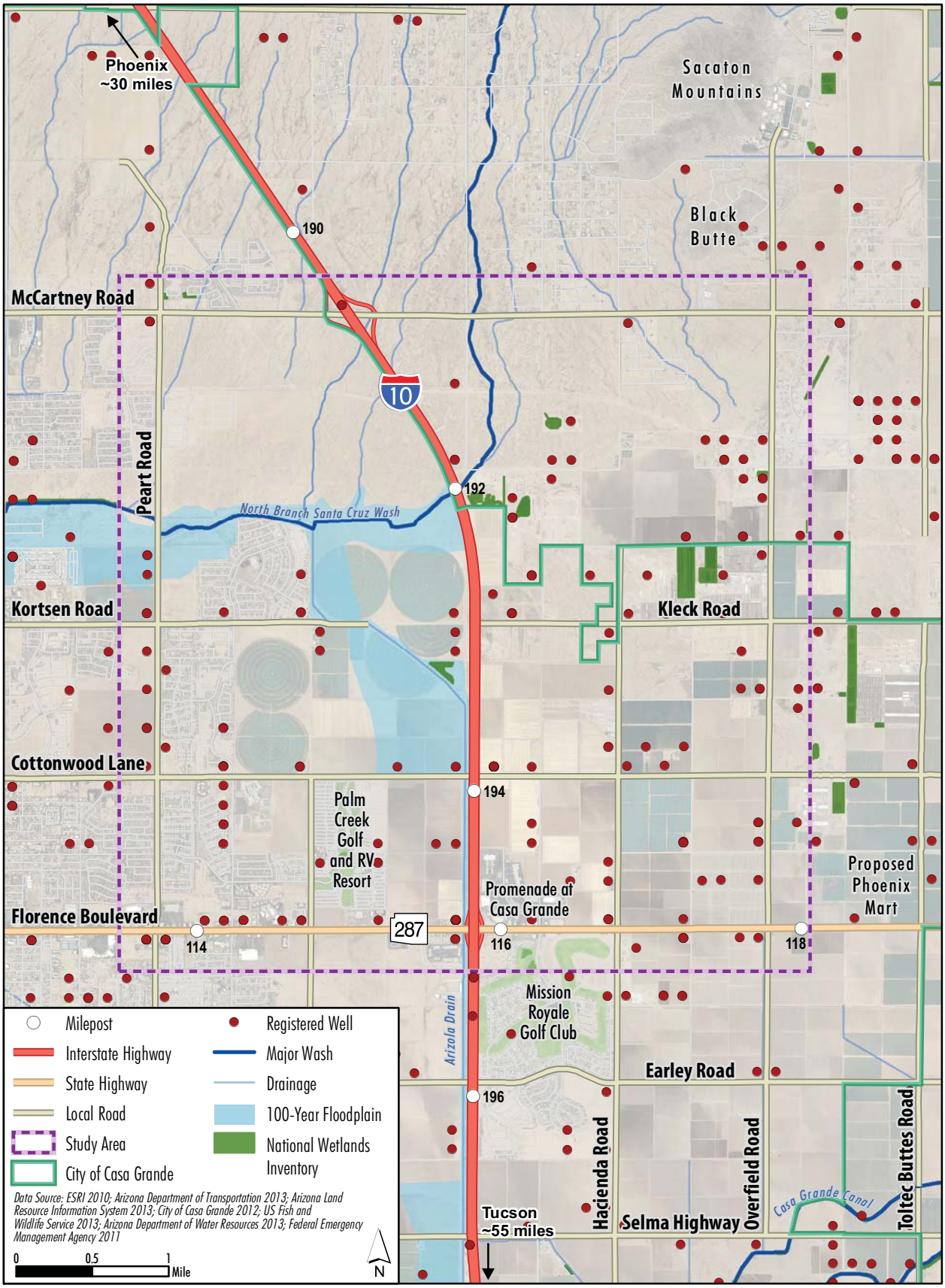
Currently, Pinal County is working with FEMA to update floodplain mapping in the county and city. Because the revised floodplain data have not been officially adopted or subject to a final determination, Figure 5 reflects the currently effective, December 2007 FIRM data.

### Water Quality

As identified on Figure 5, the North Branch of the Santa Cruz Wash is the primary wash that traverses the study area, flowing northwest toward the Gila River. Other minor drainages occur in the study area and may be jurisdictional. Most of these minor drainages flow generally in a northwesterly direction.

The majority of the study area is used for agriculture or has been developed and, except for the North Branch of the Santa Cruz Wash, no longer contains ephemeral drainages because field leveling, agricultural activity, and urban development have blocked, diverted, or altered natural flow patterns. Irrigation canals, which typically are considered non-jurisdictional utilities unless the water is taken directly from and returned directly to jurisdictional water, border some of the fields. Many irrigation districts maintain records of the jurisdictional status, or lack thereof, of their canals. No previous jurisdictional

**Figure 5 100-year Floodplains, Drainages, and Registered Wells**



delineations from within the study area are readily available on the U.S. Army Corps of Engineers (Corps) website (Corps 2013).

### Wells

According to Arizona Department of Water Resources (ADWR), approximately 182 wells are located within the study area. Of these, 25 are monitoring wells at a recorded depth of 0 to 161 feet. Twenty-four other wells show a well depth of 0 feet. The remaining 133 wells are recorded at depths ranging from 172 feet to 2,500 feet (ADWR 2013). Figure 5 shows the registered wells within the study area; some data points showing registered well locations on Figure 5 represent more than one well. Pumping capacity of the wells is identified as ranging from 9 to 2,700 gallons per minute, with 79 wells having a 0 gallon per minute pumping capacity.

## *Environmental Concerns and Recommendations for Further Analysis*

### Wetlands and Floodplains

The study area contains FEMA-mapped floodplains as well as potential wetlands mapped by the National Wetlands Inventory that could be affected by a future alternative through the addition of fill, excavation, and/or construction of bridges and other roadway structures. Impacts to floodplains from highway construction would need to be mitigated to reduce or eliminate induced increases to 100-year flood event water surface elevations, in keeping with applicable local, state, and/or federal regulations.

Overall, potential differences in impacts to wetlands and floodplains should be considered when screening and comparing alternatives.

### Water Quality

If potential waters of the U.S. would be affected by a future alternative, a jurisdictional delineation would be required during final design to identify all waters of the U.S. in the study area. Further analysis of jurisdictional waters could be addressed during the NEPA process. A pre-application meeting with the Corps is recommended to develop a mutually agreeable upon protocol for evaluating waters of the U.S. throughout the study area, to obtain previously approved jurisdictional delineations, and to determine the applicability of the previous jurisdictional delineations. Jurisdictional delineations typically have a shelf life of approximately 5 years. Coordination with the San Carlos Irrigation & Drainage District is recommended to confirm the jurisdictional status of irrigation canals in the study area. The extent of wetland areas could be evaluated during the jurisdiction delineation fieldwork.

Depending on the nature and extent of construction, the project could be permitted under a Nationwide Permit No. 14, Linear Transportation Projects. New, permanent impacts over 0.10 acre would require a pre-construction notification and Corps approval. Impacts exceeding 0.50 acre, or impacts to jurisdictional wetlands, would require an Individual Permit. All permitting activities should occur during final design so that project proponents would not have to reapply for permits because of project design changes.

Overall, potential differences in impacts on waters of the U.S. should be accounted for in the comparative performance consideration of alternatives.

### Wells

Potential differences in impacts on wells and groundwater resources should be considered when screening and comparing alternatives, and wells generally should be avoided.

## Farmlands

The Farmland Protection Policy Act (FPPA) was established in 1981 in response to concerns about the declining acreages in the United States being actively farmed. The purpose of the FPPA is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. The FPPA states that "federal programs shall be administered in a manner that, as practicable, would be compatible with state and local government and private programs and policies to protect farmland."

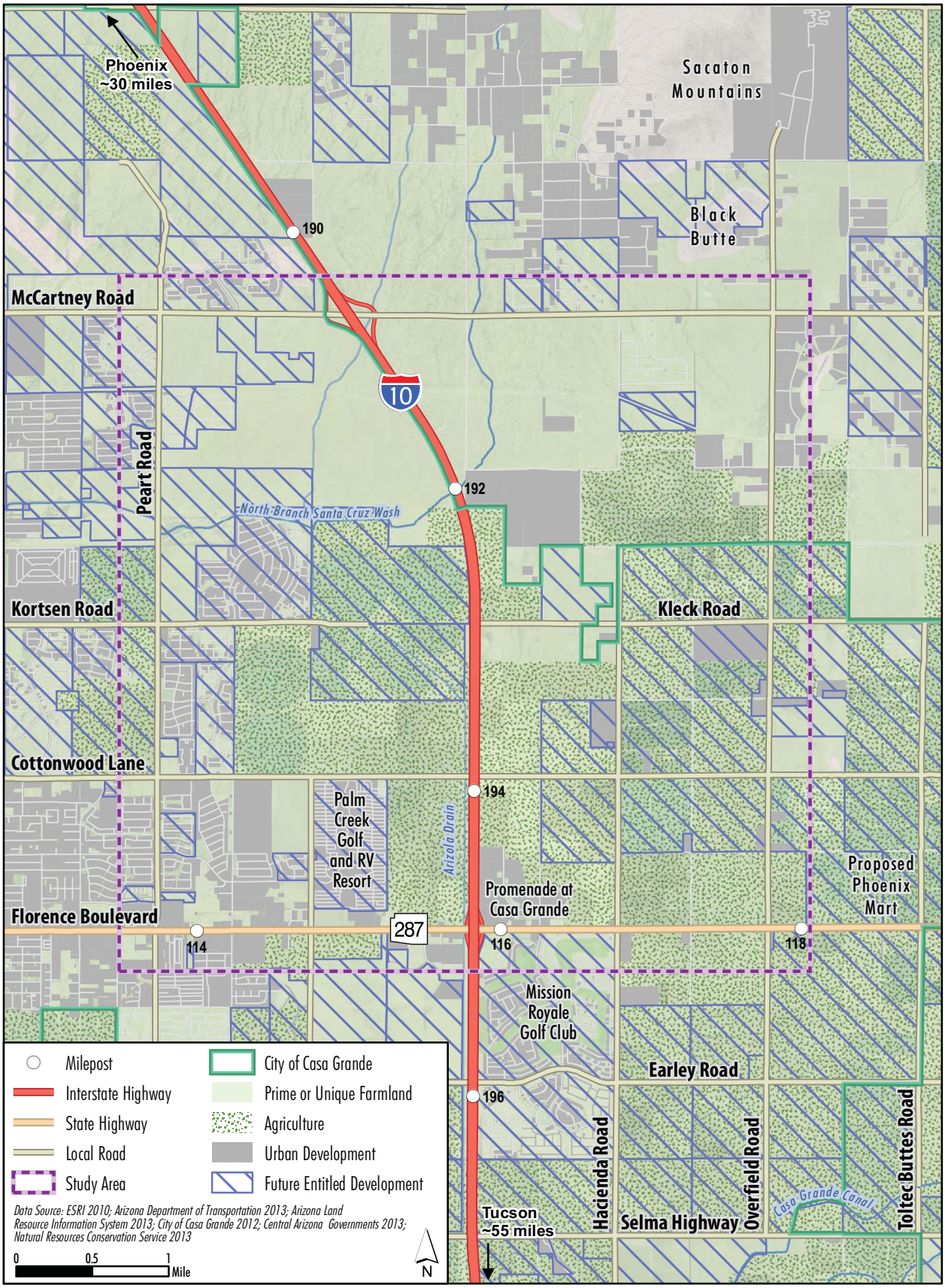
Prime or unique farmland and agricultural land are not necessarily the same. The agricultural land use designation is a product of local community planning efforts, while the prime or unique farmland designation is a product of NRCS criteria. Definitions of prime and unique farmland are as follows and are what determines the existing conditions and environmental concerns related to farmlands in the study area.

> Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. Prime farmland includes land that possesses the above characteristics, but is being used to produce livestock and timber. It does not include land already in or committed to urban development or water storage. (7 Code of Federal Regulations [CFR] 658.2)
>
> Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables. (7 CFR 658.2)
>
> Farmland of statewide importance is land, other than prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Generally, additional farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. (7 CFR 657.5 [c])

### *Affected Environment*

The presence of prime farmland soils in the study area was determined using NRCS data (NRCS 2013). As identified on Figure 6, the study area includes NRCS-designated farmland of unique importance (approximately 46 percent of the study area), and prime farmland (approximately 53 percent of the study area).

**Figure 6 Prime and Unique Farmlands**



Per NRCS data, approximately 42 percent of the study area farmland is currently used for agriculture; this equates to more than 5,600 acres currently in agricultural use. Approximately 20 percent of the study area is currently considered urban or developed land, an additional 32 percent of the study area is planned for future urban development, and 6 percent is undeveloped.

Future development plans in the study area consist mainly of residential and commercial land uses or planned communities. While the overall trend in the area is toward ongoing urban development, some lands in the northern portion of the study area remain undeveloped. In addition, approximately 2,884 acres of the agricultural lands in the southern portion of the study area (about 22 percent of the total study area) are not currently planned for development and would be protected by FPPA.

#### *Environmental Concerns and Recommendations for Further Analysis*

Because prime or unique farmlands cover approximately 99 percent of the study area, it is likely that a future alternative for a traffic interchange would affect this resource. An evaluation of the "land committed to urban development" is recommended as part of the NEPA process to verify farmland protected by the FPPA; if an alternative were to affect prime farmland, impacts would be evaluated via the Land Evaluation and Site Assessment form. Coordination with regulating agencies, including NRCS and Casa Grande, is recommended to identify farmlands of local importance, which may or may not exist in the study area.

### Noise

The key regulations and guidance that assist in determining noise impacts in Arizona and when it is applicable to provide mitigation for affected receptors include the following policies and procedures:

- Federal Highway Administration's (FHWA's) Procedures for Abatement of Highway Traffic Noise and Construction Noise (CFR Title 23, Part 772),
- FHWA's Highway Traffic Noise Analysis and Abatement Guidance (FHWA 2011a), and
- Arizona Department of Transportation's (ADOT's) Noise Abatement Policy (ADOT 2011).

CFR Title 23, Part 772, provides procedures for preparing operational and construction noise studies, as well as evaluating noise abatement considered for federal and federal-aid highway projects. Under CFR Title 23, Part 772.7, a project is categorized as a Type I, Type II, or Type III project, with a noise analysis being required for all Type I projects. A Type I project would include one of the following attributes:

- Construction of a highway on a new location;
- Physical alteration of an existing highway;
- Addition of a new through lane, high-occupancy-vehicle lane, or auxiliary lane;
- Addition or relocation of interchange lanes or ramps added to complete an existing partial interchange;
- Restriping of existing pavement for the purpose of adding a through-traffic lane or auxiliary lane; or
- Addition of a new or substantial alteration of weigh stations, rest stops, ride share lot, or toll plaza.

Table 3 lists the FHWA Noise Abatement Criteria (NAC) for different land activity categories (FHWA 2011b). The criteria specify noise levels considered to be the upper levels of acceptability for outdoor and certain indoor activities.

**Table 3 FHWA Noise Abatement Criteria**

| Activity Category[a] | $L_{Aeq1h}$ (dBA)[b] | Activity Description |
|---|---|---|
| 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) | Residential |
| C | 67 (Exterior) | Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings |
| D | 52 (Interior) | Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio structures, recording studios, schools, and television studios |
| E | 72 (Exterior) | Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in categories A–D or F |
| F | — | Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing |
| G | — | Undeveloped lands that are not permitted |

Sources: FHWA 2011b; 23 CFR 772.

[a] Activity categories B, C, and E include undeveloped lands permitted for each activity category.

[b] $L_{Aeq1h}$ is the one hour equivalent in A-weighted decibels (dBA), which is the logarithmic average of noise over a 1-hour period.

In accordance with FHWA requirements, ADOT has developed and implements a Noise Abatement Policy (NAP), which indicates that a traffic noise impact occurs under either of the following conditions:

- When the predicted level approaches[1] or exceeds FHWA's NAC or when the predicted level substantially[2] exceeds the existing noise level; or
- There is no impact threshold for activity category F or category G land uses.

[1] "Approaches" is defined as within 3 dBA of the NAC, for one-hour, A-weighted energy equivalent sound level ($L_{Aeq1h}$) for activity categories A, B, C, D and E.

[2] "Substantial" is defined as 15 dBA or greater (ADOT 2011a).

If an impact is predicted, then FHWA's procedures and ADOT policy indicate that noise abatement mitigation is to be considered. Noise abatement measures must be both reasonable and feasible as defined in the current ADOT NAP (ADOT 2011).

*Affected Environment*

Noise is generated primarily from roadways and interstates in and near the study area. However, other sources of noise include urban development, which currently accounts for about 20 percent of the study area. Noise in developed urban areas may include heating, ventilation, and air conditioning equipment; landscape maintenance equipment; amplified music; children playing; dogs barking, etc.

The agricultural and undeveloped areas of the study area, FHWA land use activity categories F and G, respectively, may experience relatively low noise levels, depending on their proximity to developed areas, highways, and other travel corridors. Over time, land uses in the study area have intensified and are varied, with residential noise-sensitive receptors (FHWA land use activity category B) concentrated mostly in the southwestern portions of the study area with other interspersed development throughout the study area.

Examples of most, but not all, FHWA noise abatement criteria activity categories are found in the study area. The main exception is that no areas were identified that meet Activity A, lands where the preservation of serenity and quiet is essential to serve an important public need. Numerous residences (Activity B) occur both in concentrated developments and dispersed in the rural areas. Facilities meeting the Activity C criteria are mostly interspersed within the more highly concentrated residential development areas. Figure 7 shows noise-sensitive areas.

*Environmental Concerns and Recommendation for Further Analysis*

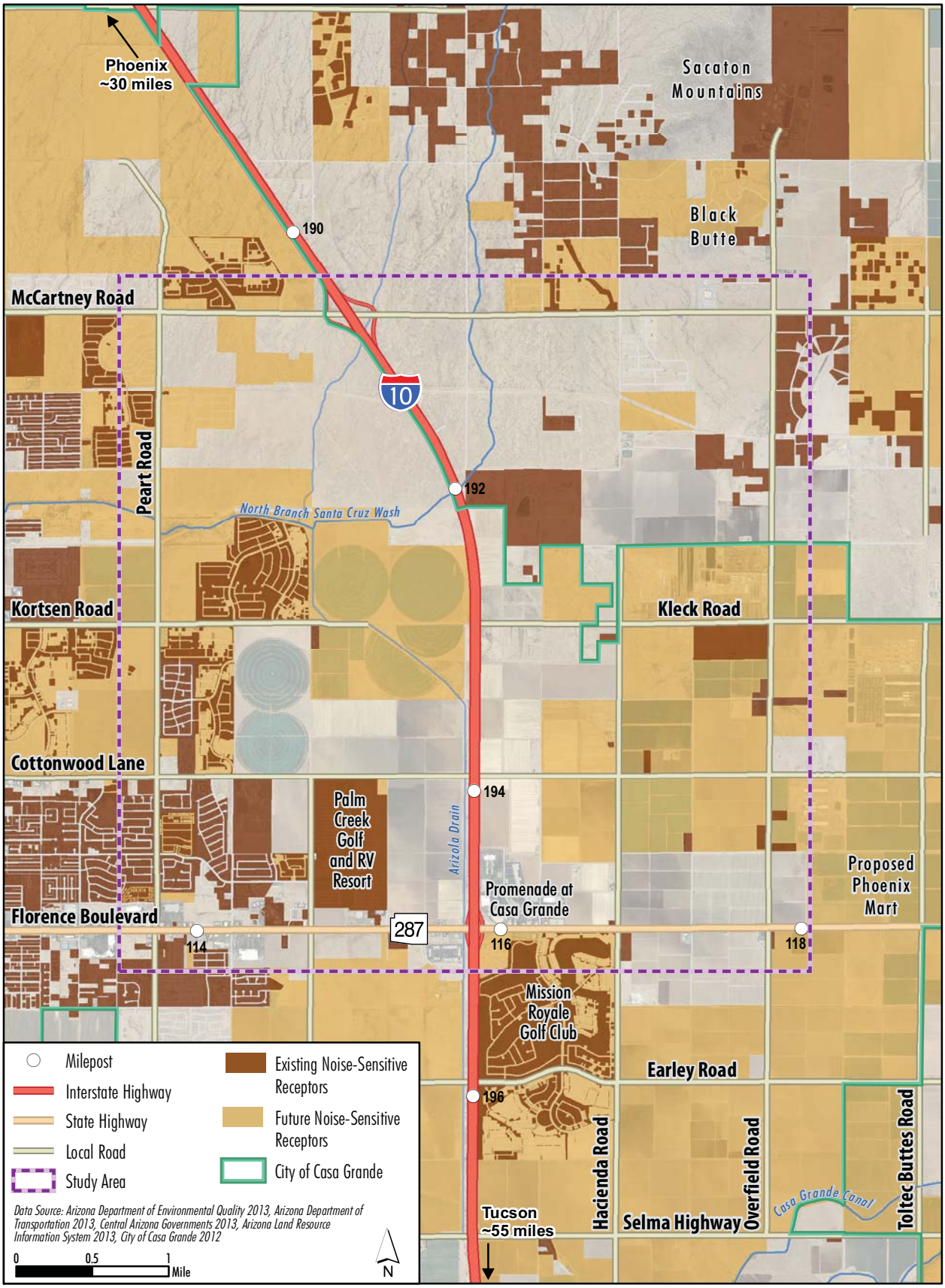
Maintaining acceptable noise levels to preserve the character of open spaces, residential quiet zones, and recreational facilities are to be considered when selecting a potential traffic interchange location. Existing and future parks, recreational trail systems, residential development, and community uses requiring low noise levels would be identified as part of the noise analysis. If a future alternative were to potentially affect noise-sensitive receptors or qualify as a Type I project, a detailed noise analysis of noise-sensitive areas located within 1,000 feet of each proposed alternative alignment would be recommended during the NEPA process. If the modeled noise levels exceed FHWA noise thresholds, feasible and reasonable noise abatement measures would be assessed for the affected noise-sensitive receptors.

Overall, the locations of noise-sensitive receptors may contribute to establishing differences among possible alternatives that may occur in the study area. Therefore, potential differences in impacts on noise-sensitive receivers should be included in the criteria used to screen and compare alternatives.

## Air Quality

Air quality for projects of regional significance is assessed at the regional and project level. The study area is under the jurisdiction of EPA, Arizona Department of Environmental Quality (ADEQ), Pinal County Air Quality Control District, Central Arizona Governments, and Sun Corridor Metropolitan Planning Organization.

**Figure 7 Noise-Sensitive Areas**



The Clean Air Act (CAA) of 1970, which was last amended in 1990, is the federal law that governs air quality. EPA is responsible for establishing National Ambient Air Quality Standards (NAAQS) for six criteria pollutants in order to protect the public from the health hazards associated with air pollution. These six criteria pollutants are carbon monoxide (CO), ozone ($O_3$), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), particulate matter less than 2.5 microns in diameter and less than 10 microns in diameter ($PM_{2.5}$ and $PM_{10}$), and lead (Pb). Arizona has adopted these NAAQS for each of the six criteria pollutants, and for the purposes of this study, pollutants typically associated with vehicle traffic (CO, $O_3$, nitrogen oxides [$NO_x$], $PM_{2.5}$, and $PM_{10}$) are of specific concern.

Furthermore, EPA designates areas as meeting (attainment) or not meeting (non-attainment) the established standards for each criteria pollutant. In other words, attainment status indicates that air quality in an area meets the NAAQS for a criteria pollutant. An area can also be classified as non-attainment status, indicating that air quality does not meet the NAAQS standards. Areas previously designated as non-attainment status that have consistently demonstrated meeting the NAAQS are reclassified as maintenance areas, although submittal and approval of maintenance plans to EPA is required under the CAA.

### *Affected Environment*

As a historically rural area, Pinal County has not experienced the air quality challenges faced by the metropolitan areas of Phoenix and Tucson. However, significant growth in population and development over the last 10 years has brought a steep reduction in overall air quality. While the portion of Pinal County in which the study area is located is designated as an attainment area for $O_3$, CO, $NO_2$, $SO_2$, and Pb, it is a non-attainment area for the 24 hour $PM_{10}$ standard. On May 22, 2012, EPA signed the West Pinal $PM_{10}$ nonattainment designation and cited Pinal County's $PM_{10}$ levels as some of "the worst in the country" (EPA 2012). The study area is entirely within the $PM_{10}$ non-attainment area.

### Air Quality Monitoring

The Pinal County Air Quality Control District monitors concentrations of criteria pollutants at 15 monitoring stations in Pinal County. The Pinal County Housing Complex and Casa Grande Downtown are the monitoring stations nearest to the study area; these monitoring stations are approximately 7.5 miles and 4.5 miles, respectively, from the center point of the study area. The Pinal County Housing Complex station shows a generally decreasing 24-hour $PM_{10}$ trend from a rather high year in 2006 through 2007. In 2010, the average $PM_{10}$ level showed a slight decrease followed by an increase in 2011 and then a decrease again in 2012. The Casa Grande station has generally been within the $PM_{10}$ standard in recent years (Pinal County Air Quality Control District 2013). Arizona has four calendar years remaining to attain the $PM_{10}$ standard from the Mary 31, 2013 posting of the redesignation in the *Federal Register* (EPA 2012).

### Mobile Source Air Toxics

In addition to the NAAQS for criteria air pollutants, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries). The amount of mobile source air toxics (MSATs) emitted from a project would be proportional to the vehicle miles traveled. Technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects currently limit meaningful and/or reliable estimates of MSAT emissions and effects. However, levels of future MSAT emissions from the project can be qualitatively assessed during the

NEPA process (although a qualitative MSAT analysis cannot identify and measure health impacts). This analysis can provide a basis for identifying and comparing the potential differences among MSAT emission, if any, between alternatives. Additional MSAT information is presented in Appendix B.

#### Class I Areas

Under the provisions of the CAA, EPA has designated a number of areas in Arizona as mandatory Class I Federal Areas, where visibility is an important value. These include national parks and wilderness areas. These Class I areas are listed in 40 CFR 81.403. Of the Class I areas, the Superstition Wilderness Area is the closest Class I area to the study area, approximately 35 miles northeast in Maricopa County.

#### Conformity

The CAA requires that all regionally significant and federally-funded transportation projects in non-attainment or maintenance areas must meet the transportation conformity regulations. Pursuant to the conformity provisions of the CAA, projects in non-attainment or maintenance areas must conform to the established State Implementation Plan and ensure that transportation activities would not cause or contribute to new violations, worsen existing violations, or delay attainment of air quality standards. An air quality nonexempt project generally adds transportation capacity and must comply with the conformity requirements.

At the project level, FHWA is mostly concerned with CO because it is directly emitted from the tailpipes of motor vehicles. Conformity at the project level requires a “hot spot” analysis if an area is in “non-attainment” or “maintenance” for CO.

#### *Environmental Concerns and Recommendations for Further Analysis*

To comply with State and local air quality requirements, a project constructed in the study area must be included in the fiscally-constrained and air quality-conforming programs and plans. The project would also need to adhere to local air quality regulations, including the Pinal County Air Quality Control District Code of Regulations, Title 18 of the Arizona Administrative Code, and the Arizona Revised Statutes (ARS) Section 49-401.

According to 40 CFR 93.116, all FHWA non-exempt projects must have a project-level conformity determination. Because the study area is within an area designated as non-attainment for the 24-hour $PM_{10}$ standard, a qualitative analysis of $PM_{10}$ will be addressed in the NEPA process. A conformity determination would be conducted based on interagency consultation, which would typically involve FHWA, Pinal County, Central Arizona Governments, and Sun Corridor Metropolitan Planning Organization. Hot-spot analyses of CO would not be required during the NEPA process because the study area is in attainment for CO. A qualitative assessment of MSATs would be provided during the NEPA process and would derive, in part, from FHWA guidance (FHWA 2011a).

Overall, potential air quality impacts would not be critical to the screening and comparison of alternatives.

### Hazardous Materials

#### *Affected Environment*

A windshield survey, review of aerial imagery, and a review of agency databases maintained by the U.S. EPA (2013a; 2013b; 2014a), ADEQ (2014), and ADWR (2014) were completed for the study area. The

purpose of the regulatory database review was to evaluate and identify the presence of hazardous materials or similar environmental concerns present in the study area.

Potential hazardous materials sites are often associated with past and current activities on or nearby the site. A majority of the study area is relatively free of potential hazardous material sites because the study area consists of primarily undeveloped and agricultural areas. Older developed sites, such as the Casa Grande city center, have higher concentrations of potential sites. Older industrial areas, where mining and other activities have taken place over time, also demonstrate higher frequencies of potential hazardous materials sites.

The environmental database search and study area reconnaissance revealed the following potential hazardous material sites, which are all clustered around SR 287 (Florence Boulevard) in the southern portion of the study area:

- Eleven Resource Conservation and Recovery Act (RCRA) sites (EPA 2014a);
- Eight sites with underground storage tanks (USTs) (ADEQ 2014); and
- Ten sites with leaking USTs (LUST) sites (all closed) (ADEQ 2014)

Figure 8 shows the locations of the areas with potential hazardous material concerns and Appendix C provide more detailed information about the sites identified within the study area.

A review of current and historic aerial photographs shows the presence of historic and current agricultural fields in the study area. The presence of these agricultural fields indicates a medium-to-high risk within the study area from the potential for residual concentrations of pesticides, herbicides, and/or their breakdown products in or on area soils. However, it is unknown whether soil sampling and testing have been previously conducted in the study area.

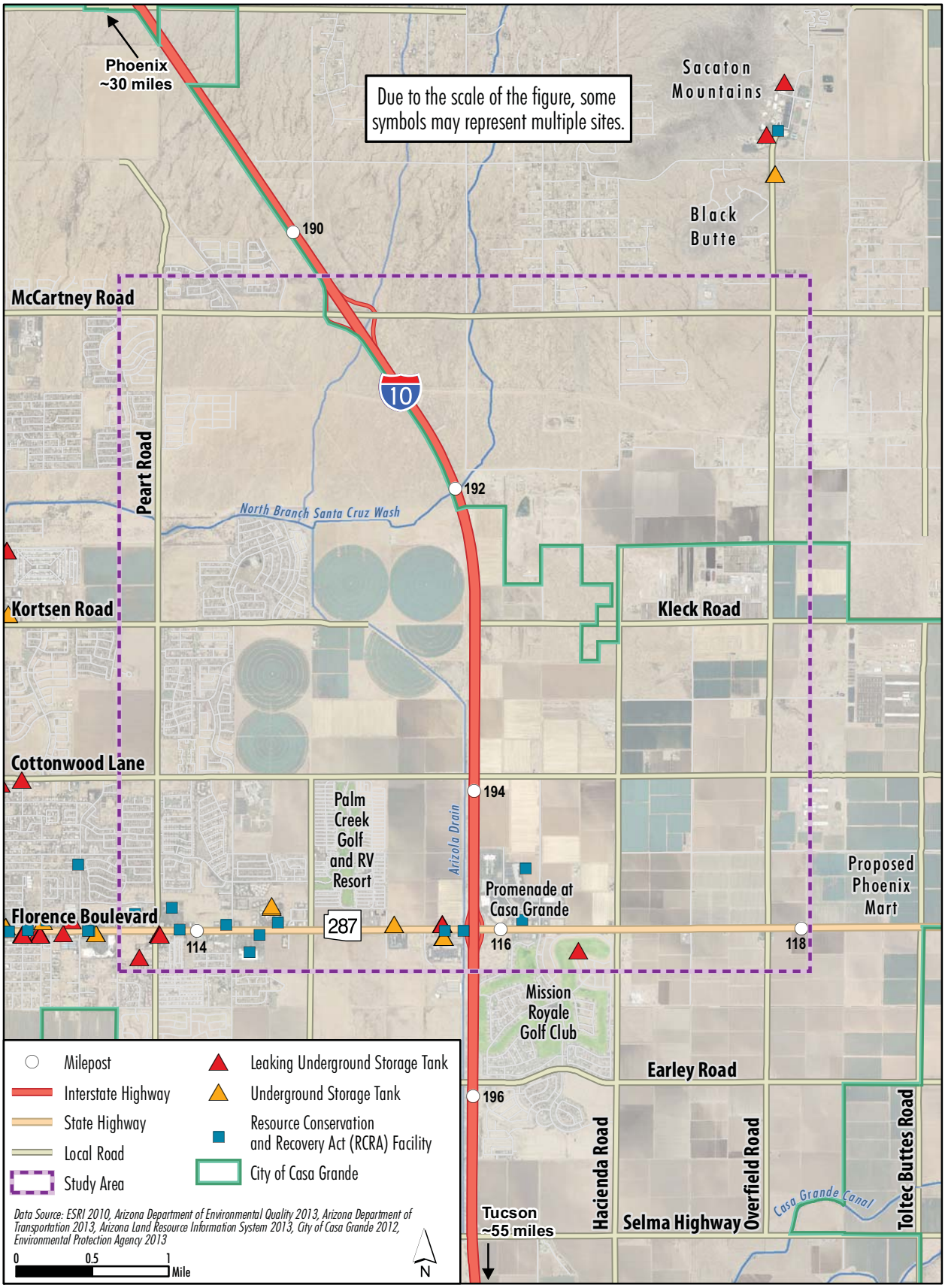
### *Environmental Concerns and Recommendations for Further Analysis*

Appendix C lists the potential hazardous material risks in the study area and provides information, risk category, and recommendations for further action. The hazardous materials evaluation considered the relative risk of a hazardous materials site if it were to be located within a potential transportation corridor or acquired as part of the new ROW. Appendix C presents recommendations for avoidance based on the current knowledge of the study area and environmentally recognized conditions. More site-specific analysis of hazardous materials would be undertaken during the NEPA process.

Asbestos sampling and/or abatement was not considered in the new right-of-way scenarios discussed in Appendix C. In general, National Emission Standards for Hazardous Air Pollutants regulations require that a certified inspector sample any structures that will undergo demolition or renovation activities for asbestos prior to the action. National Emission Standards for Hazardous Air Pollutants notification is also to be submitted to the regulatory agency responsible for enforcement of air quality regulations (in this instance, Pinal County). This notification is required to be submitted regardless of the presence or absence of asbestos.

In the event that the amount of asbestos is 160 square feet, 260 linear feet, or 35 cubic feet or more, it is considered regulated asbestos, and a certified contractor would remove it prior to any disturbance.

**Figure 8 Hazardous Materials and Recognized Environmental Concerns**



These regulations apply to load-bearing structures and are interpreted to include roadway structures such as bridges and culverts in addition to buildings. As a result, if any roadway structures or buildings would be demolished as part of a future alternative, each would likely require asbestos sampling and possibly asbestos abatement, depending on the results of the sampling. However, the potential presence of asbestos or lead-based paint would not be expected differentiate between alternatives.

In addition, certain buildings and roadway structures in the study area are likely to contain lead-based paint. Because materials containing lead can be a hazardous waste under RCRA and because the Occupational Safety and Health Administration regulates each as a safety hazard, sampling for lead-based paint is also recommended on certain buildings and roadway structures that would potentially be demolished as part of a future alternative.

The agricultural fields in the study area likely contain residual concentrations of pesticides, herbicides, and/or their breakdown products. It is also likely that soils in areas recently converted from agricultural to developed lands, as well as soils in the study area adjacent to agricultural lands may be affected based on their proximity to the fields and through transport by water and/or wind. If these soils are removed during a future project, the soils should be sampled for common pesticides and herbicides, and properly characterized as solid or hazardous waste prior to transport for off-site disposal in accordance with applicable solid and hazardous waste regulations. Also, it is recommended that health and safety precautions be implemented that are appropriate to construction work in soils containing pesticides and/or herbicides. This would include adequate dust control during all phases of construction and until disturbed areas become re-stabilized.

Although the potential for common pesticides and herbicides to be present in the study area (based on current and historical agricultural use) presents a medium-to-high risk requiring proper disposal and health and safety precautions, this risk would not be considered a critical factor for evaluating future projects or differentiating between alternatives because most soils in the study area likely contain traces of pesticides or herbicides. In addition, a new traffic interchange generally could not be constructed without disturbing reinforced concrete box culverts, corrugated/reinforced corrugated metal pipe culverts, and/or paint that may contain asbestos or lead. Therefore, the potential presence of asbestos or lead-based paint would not help to differentiate between alternatives.

Overall, all of the hazardous materials sites identified at this stage are considered low risk with respect to construction of a future traffic interchange. However, it is recommended to avoid acquisition of four of the identified RCRA sites (see Appendix C for details). Hazardous materials should be included in the criteria used to screen and compare alternatives.

### Section 4(f) and Section 6(f) Resources

Section 4(f) of the U.S. Department of Transportation Act of 1966 and Section 6(f) of the Land and Water Conservation Fund Act are intended to protect the nation's recreational resources from significant transportation-related impacts. Section 4(f) states that the Secretary of Transportation:

…may approve a transportation program or project…requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if…there is no prudent and feasible

alternative to using that land and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use. (49 United States Code [U.S.C.] 303[c])

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

- Property is permanently incorporated into a transportation facility;
- There is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or
- There is a constructive use of a Section 4(f) resource.

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

- The projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive resource protected by Section 4(f).
- The proximity of the proposed action substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. Examples of such an effect would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally-significant historical building, or substantially detracts from the setting of a Section 4(f) resource that derives its value in substantial part due to its setting.
- The project results in a restriction of access that substantially diminishes the utility of a significant Section 4(f) resource, such as a publicly-owned park, recreation area, or historic site.

A historic site is considered a Section 4(f) resource if it is eligible for the National Register of Historic Places (NRHP) under Criterion A, B, or C. Notably, this would occur if the resource:

- Is associated with events that have made a significant contribution to the broad patterns of our history (Criterion A);
- Is associated with the lives of persons significant in our past (Criterion B); or
- Embodies the distinctive characteristics of a type, period, or method of construction or that represents the work of a master, or that possesses high artistic values, or that represents a significant distinguishable entity whose components may lack individual distinction (Criterion C).

Section 6(f), which refers to Section 6(f)(3) of the Land and Water Conservation Fund Act (Public Law 88-578), requires that any property acquired or developed with Land and Water Conservation Fund assistance be maintained perpetually in public outdoor recreation use. The acquisition of a Section 6(f) resource requires that the property be replaced in-kind, and only with the approval of the National Park Service.

*Affected Environment*

The study area and a 0.25-mile buffer were reviewed for publicly owned parks, recreation areas, wildlife and waterfowl refuges, and historic properties protected under Section 4(f). This 0.25-mile buffer accounts for potential constructive use impacts (e.g., noise and visual impacts) that may extend outside of the study area.

Figure 9 shows the location of potential Section 4(f) resources within and around the study area, and Appendix D, Table D-1, provides a listing of properties that were preliminarily evaluated for Section 4(f) resource potential. Additionally, Appendix D provides the location of each resource and its proximity to the study area; the agency or owner having jurisdiction over the resource, features, and/or amenities; and whether the resource is recommended for protection under Section 4(f). No wildlife or waterfowl refuges or Section 6(f) properties were identified in the study area. In summary, the potential Section 4(f) resources within the study area or 0.25-mile buffer include:

- Four existing schools
- Three existing public parks
- Portions of 11 planned trails and multi-use paths
- One planned trailhead
- One historic property

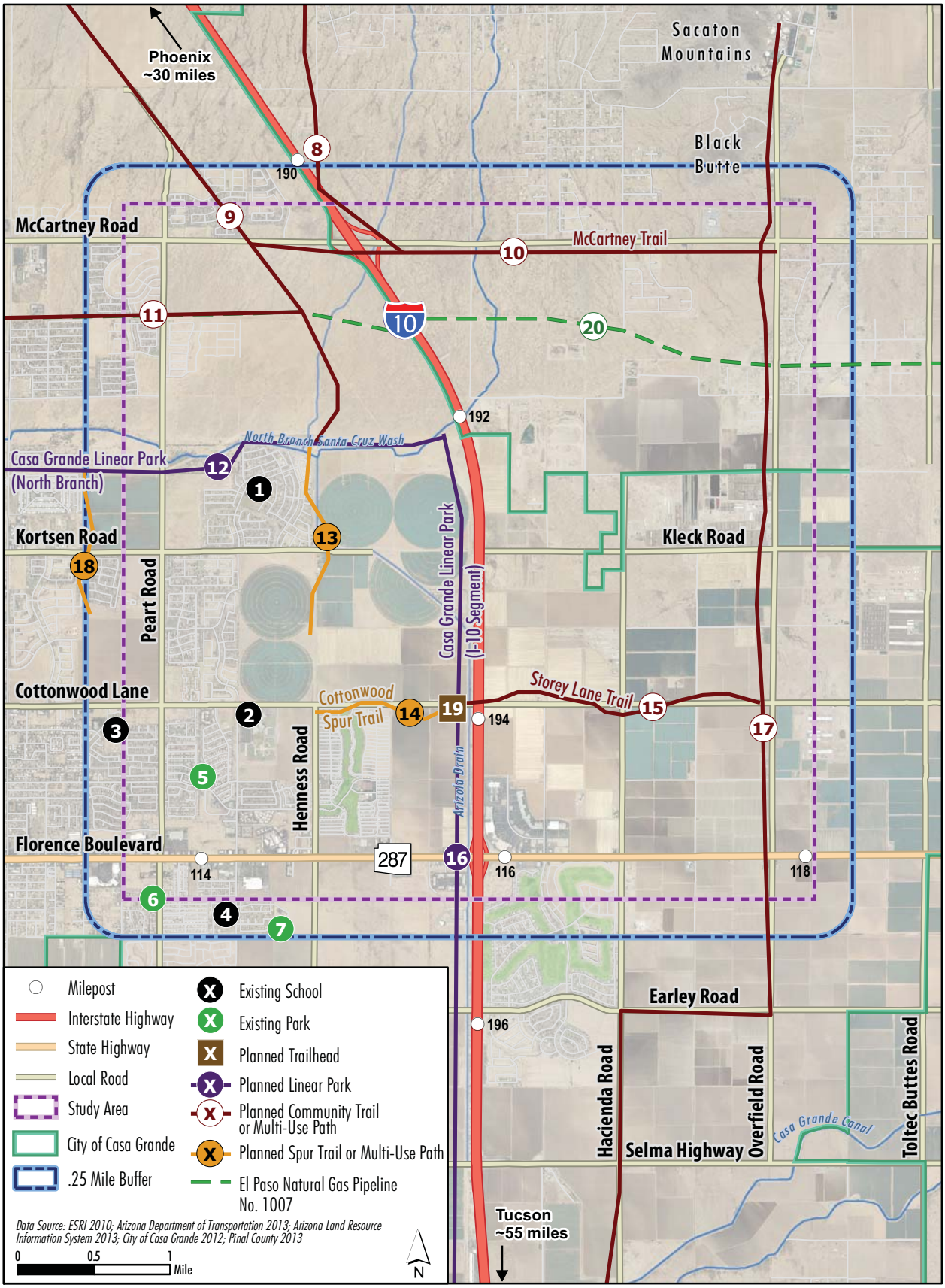
The planned trails and multi-use paths are part of the *Casa Grande Regional Trail System Master Plan* (City of Casa Grande 2008). Trails 12 and 16 on Figure 9 are portions of the Casa Grande Linear Park (North Branch segment and I-10 segment, respectively). Linear parks are broad open-space corridors that are typically 100 feet in width or wider and include paved pathways, trails, native and constructed landscapes, rest areas, small recreation nodes, and other amenities. Community trails offer similar amenities, but the trail corridors are narrower (typically 50 feet) and less extensively developed. The study area also has three spur trails, which typically extend from proposed linear parks into developed portions of the community where they may connect to a network of sidewalks and bicycle lands to maximize public access to linear parks and the regional trail system.

*Environmental Concerns and Recommendations for Further Analysis*

With respect to the potential Section 4(f) properties in the study area and 0.25-mile buffer:

- Three existing public parks, Ivy Park, Sierra Ranch Park, and Colony Park are considered Section 4(f) resources and should be avoided when developing traffic interchange alternatives.
- Effects of a future alternative on any of the remaining potential Section 4(f) resources would necessitate investigation and coordination to minimize, avoid, or mitigate potential impacts if these features are determined to be Section 4(f) resources.
- The 1-10 segment of the proposed Casa Grande Linear Park essentially parallels I-10 for approximately 5.9 miles in the study area and continues beyond the study area boundaries. Because of the extent of this planned trail/linear park along I-10 and the relative uniform proximity from the highway, the degree of differentiation among possible alternatives in the study area is diminished.

**Figure 9 Potential Section 4(f) Properties**



Should the project result in Section 4(f) involvement, a Section 4(f) evaluation report would be required to document:

- Coordination with local jurisdictions and, as warranted, project stakeholders;
- Attempts to avoid the resources;
- Direct or constructive use impacts;
- Measures to minimize harm; and
- Any impacts from temporary occupancy of a Section 4(f) resource.

All "potential" Section 4(f) resources would require additional coordination with the local official having jurisdiction over each property in order to determine if the property is of local significance and if it would be affected by a future alternative. Determining the Section 4(f) eligibility of schools requires investigation into whether the publicly owned school's recreational facilities are available for public use. This is based on coordination with the district(s) having jurisdiction over the school. If a school's recreational facility is available for public use without prior authorization outside of school hours, then the school is afforded Section 4(f) protection. Even fenced schools would be considered Section 4(f) if their gates remain open.

Because a number of the potential Section 4(f) resource sites are in the planning stage of development, close coordination with the future owner/operators of these facilities (e.g., Pinal County Natural Resources Parks and Recreation, City of Casa Grande Community Services Department) would be prudent during the NEPA process if any of the planned sites would be affected by a future alternative. This could provide for opportunities to avoid the resources, minimize impacts, or ensure compatibility.

Historic properties that are also potentially Section 4(f) resources, which will be evaluated during the NEPA process, would require coordination with the official with jurisdiction, the State Historic Preservation Office (SHPO), and/or local preservation agencies to determine whether the resource is locally important or if the resource would be affected by a future alternative.

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

The first requirement when dealing with properties afforded Section 4(f) protection is to develop specific measures to minimize harm, with avoidance of the resource being the preferred approach. Each alternative carried forward for further study would be analyzed for direct use, constructive use, and, if warranted, measures to minimize harm. If avoidance is determined not to be "prudent and feasible,"

then measures to minimize impacts would be developed and require coordination with vested agencies, jurisdictions, and possibly major user groups on the part of the project proponents and FHWA.

The potential Section 4(f) resources include several proposed trails or linear parks that parallel or intersect I-10, lessening the degree of differentiation among possible alternatives. Because the proposed McCartney Trail, Cottonwood Spur Trail, and Storey Lane Trail are perpendicular to I-10, it may be easier to avoid these potential Section 4(f) resources than for the proposed Casa Grande Linear Park, which parallels I-10. Overall, potential differences in impacts on Section 4(f) resources must be included in the criteria used to screen and compare alternatives.

## *Socioeconomic Environment*

### Land Use, Ownership, and Jurisdiction

#### *Affected Environment*

Land use is a representation of the current physical use of the land, along with entitled developments (e.g., planned residential communities that municipal and/or county planning boards have approved). General information on study area land use was obtained through online aerial imagery and research, as well as field reconnaissance conducted in October 2013.

The study area is predominantly within the boundaries of Casa Grande. Outside of the city limits, in the northeast portion of the study area, the land is part of unincorporated Pinal County. As illustrated on Figure 2, most of the land in the study area is privately owned. The study area also includes land under the jurisdiction of ASLD, which manages its land for multiple uses, including grazing allotments, recreation, and surface and subsurface mineral rights. Several plans govern growth and development in the study area and the surrounding region, including:

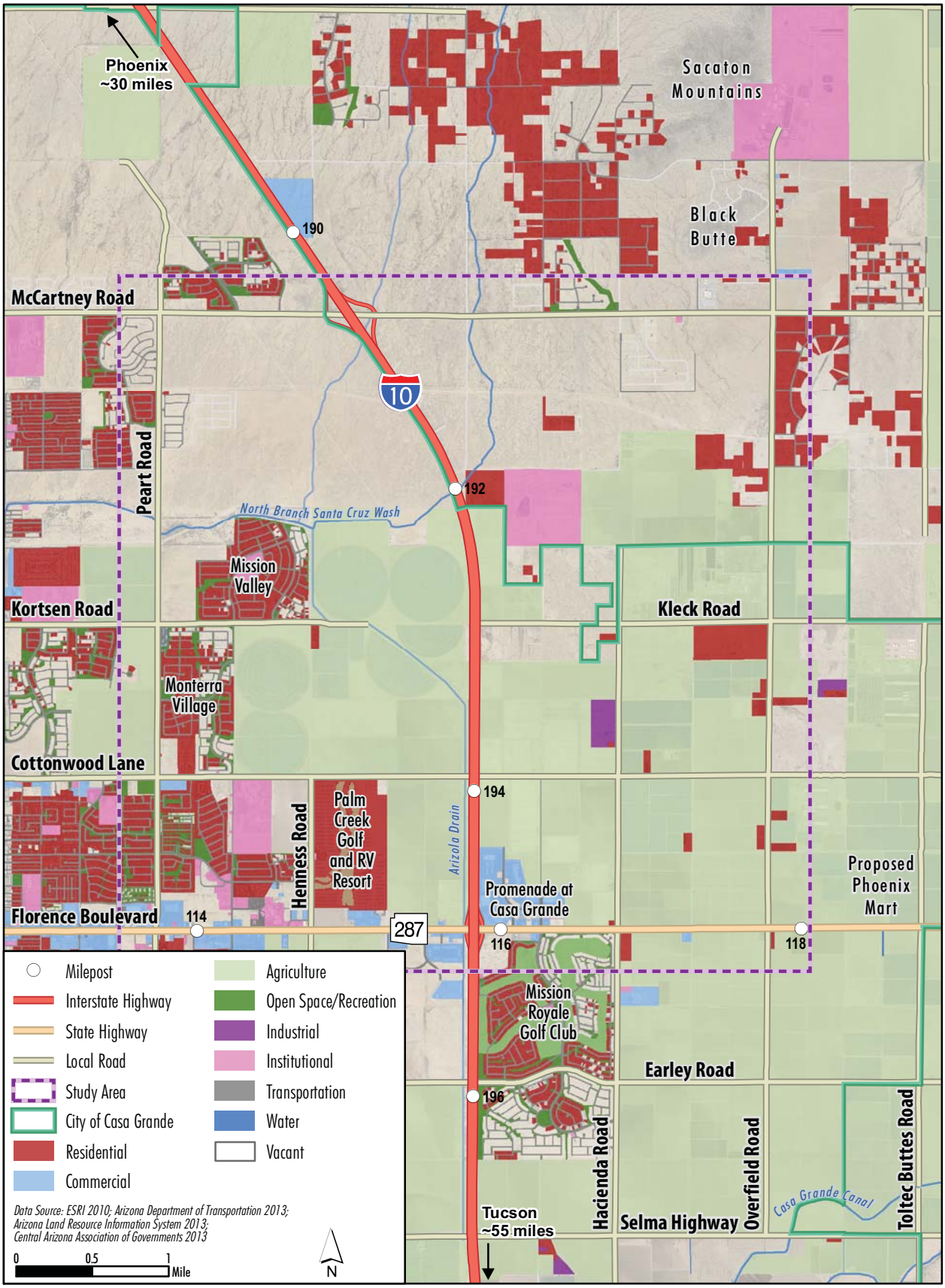
- *City of Casa Grande General Plan 2020* (City of Casa Grande 2009)
- *City of Casa Grande Regional Trail System Master Plan* (City of Casa Grande 2008)
- *Pinal County Comprehensive Plan* (Pinal County 2009, updated 2012)
- *Pinal County Open Space and Trails Master Plan* (Pinal County 2007)

Figure 10, which shows general existing land use, illustrates that most of the study area is in agricultural use or vacant, undeveloped land. The southwest portion of the study area has the greatest degree of residential, institutional, and commercial development. Interspersed within these developments are playground areas, schools, parks, and a public golf course. Figure 6 shows that several of the agricultural and undeveloped parcels are planned for future development, and may be entitled.

Residential, mixed-use, and commercial developments in the study area that are underway or built out include:

- Mission Valley
- Monterra Village
- Palm Creek Golf and RV Resort
- Promenade at Casa Grande
- Mission Royale Golf Club

**Figure 10 Existing Land Use**



As shown on Figure 10, a large part of the study area is in agricultural use and much of the northernmost portion of the study area is undeveloped and vacant land.

### *Environmental Concerns and Recommendations for Further Analysis*

Land use in the study area does not present any unique physical attributes that warrant special consideration not typically accounted for on this type of study. Potential differences among possible alternatives that may occur in the study area as a result of land use designations could include the varying extent of property acquisition and access changes needed. Different alignment alternatives may require different amounts of land to be converted to transportation use within agricultural, commercial, industrial, or residential areas.

Additional analysis to determine if future alternatives would be consistent with adopted land use plans and zoning is recommended during the NEPA process. If a future alternative affects land under the jurisdiction of the ASLD, coordination to determine consistency with the agency's plans would also be recommended. It is recommended that alternative alignment locations and designs be compatible with existing commercial/industrial land uses and, to the extent practicable, adjacent residential land uses as well.

Overall, consistency with existing and future land use plans and zoning should be included in the criteria used to screen and compare alternatives.

## Socioeconomics

### *Affected Environment*

The study area's socioeconomic analysis includes land within Casa Grande and unincorporated Pinal County. Overall, the study area has experienced substantial increases in population and development with population roughly doubling between 2000 and 2010.

Pinal County's population growth has ranked among the highest in the nation since 2000. Table 4 presents population and growth data for the study area. Growth has continued, although more slowly (on a pace of 10 to 15 percent for the current decade) than in the 2000s (when growth was about 70 to 90 percent).

**Table 4 Study Area Population and Growth Data**

| Jurisdiction | Population | | | Growth from 2000 to 2010 | Growth since 2010 |
|---|---|---|---|---|---|
| | 2000 | 2010 | 2012 | | |
| Casa Grande Urban Area[a] | 29,815 | 51,331 | N/A | 72.2% | N/A |
| Casa Grande city | 25,224 | 48,571 | 49,974 | 92.6% | 2.9% |
| Pinal County | 179,727 | 375,770 | 387,365 | 109.1% | 3.1% |

Sources: U.S. Census Bureau 2014a; 2014b

[a] The Casa Grande Urban Area includes unincorporated areas of Pinal County. In 2000, Casa Grande did not quality as a designated Urban Area; however, the 2010 Census provides comparative population statistics for both 2000 and 2010.

The study area is on the easternmost side of Casa Grande. A review of a 1997 aerial photograph (Google Earth 1997) shows that development was beginning north of SR 287 (Florence Boulevard) and east of

Peart Road, but the balance of the study area appears to be rural or undeveloped at that time. Therefore, most of the residential and commercial development in the study area is relatively recent, occurring within the last 20 years.

The residential neighborhoods in the study area are predominantly in the southwest portion of the study area, primarily (but not exclusively) between Peart and Henness roads and south of the North Branch of the Santa Cruz Wash. Neighborhood continuity is mixed, with historic aerial photographs showing that the majority of the residential development is less than 10 years old. Many of the residential developments have pedestrian/bicycle paths incorporated into their design as well as greenbelts, parks, and playgrounds. Multi-use paths sometimes connect to others in adjacent subdivisions. Entrances to these residential developments are often located directly across the arterial road from one another, fostering a sense of connection.

Major industries in Pinal County include government, retail trade, manufacturing, hospitality, and food service. The 2012 unemployment rate was 8.6 percent (Pinal County 2014). Casa Grande's elementary and high school districts and government offices are among the City's largest employers. Abbott Nutrition; Casa Grande Regional Medical Center; Daisy Brand; Frito-Lay, Inc.; Hexcel Composites; Walmart Distribution Center #7013; NVC; Price; Westile Roofing Products; and Monsanto are also major employers in Casa Grande. However, none of these employers are located in the study area (City of Casa Grande 2014).

#### *Environmental Concerns and Recommendations for Further Analysis*

Construction of a traffic interchange along I-10 in the study area would likely result in property acquisitions. Most of the land along the highway is undeveloped or in agricultural use, so displacements or relocations of residents and businesses are unlikely unless widening or other construction along arterial streets extending from the proposed interchange cannot be accommodated within the existing ROW.

Depending on the range of alternatives considered during the NEPA process, impacts on neighborhood continuity could vary. It is recommended that future alternatives not encroach considerably beyond the existing transportation network, particularly in developed areas. Impacts to community cohesion and character; access to institutions such as schools; and impacts on emergency response times and other public services would vary from one alternative to another, all of which would require individual analysis.

As with all construction projects, access during and after construction is likely to be of primary concern to residents and business owners. An aggressive public and business community involvement program is recommended to minimize issues and assist businesses.

Overall, potential differences in impacts on socioeconomics, especially residential and commercial displacements, should be included in the criteria used to screen and compare alternatives.

### Title VI/Environmental Justice

Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. Executive Order 12898 directs that programs, policies, and activities identify and address, as

appropriate, disproportionately high and adverse human health and environmental effects on minority and low-income populations.

For environmental justice and Title VI evaluations, consideration is given to the following population types:

- Racial and ethnic minorities,
- The elderly (persons 60 and older),
- Persons with disabilities,
- Female heads of household (with children younger than 18 and no husband present), and
- Low-income households (household income at or below the U.S. Department of Health and Human Services poverty guidelines).

Environmental justice analyses have historically relied on decennial census data for identifying these protected populations. In the past, the "long form," which was sent to a random selection of homes, provided statistical data that included detailed disability, income, dwelling, journey-to-work, household, and vehicle ownership information.

Changes in data gathering for the 2010 and future censuses have created gaps with regard to income and disability status. In a program that began in 1995 and was fully implemented in 2010, the U.S. Census Bureau has used the American Community Survey (ACS) to obtain the demographic, housing, social, and economic information formerly gathered through the "long form." Going forward, the ACS will capture income and disability data no longer provided by the decennial census.

The ACS annually samples a small number (approximately 1 percent) of households across the country, and, while it does not provide official population counts, it does provide the ability to monitor social and economic trends in a local community. The ACS combines population or housing data from multiple years to produce reliable numbers for small counties, neighborhoods, and other local geographies.

ACS data are released as both single-year and multi-year estimates. For smaller geographies such as census tracts or block groups, ACS data are only available in five-year estimates, requiring that five years of data be collected before results can be released. These estimates are updated by removing the earliest year's data and replacing it with the most recent year. For instance, the 2007 to 2011 estimate was replaced with a 2008 to 2012 estimate, which was released in 2013.

To account for the differences in Census and ACS data, FHWA's Arizona Division has determined the specific sources to use for environmental justice data collection. Based on the current availability of data, Table 5 presents each type of data typically accessed in an environmental justice evaluation as well as the currently recommended source. [3]

[3] This approach, approved in January 2012, was developed by ADOT's Environmental Planning Group in concert with FHWA's Arizona Division.

**Table 5 Recommended Sources for Environmental Justice Data Collection**

| Data Set | Source |
|---|---|
| Racial and ethnic minorities | Census 2010 |
| Elderly (persons 60 and older) | |
| Female heads of household (with children <18 and no husband present) | |
| Low-income households (persons living below the poverty level) | 2008-2012 ACS |
| Persons with disabilities | 2008-2012 ACS |

ACS = American Community Survey

### *Affected Environment*

Figure 11 illustrates the minority percentage of the total population in the study area by Census block group. The 2010 Census data indicate that minority populations are widespread within the study area (see Appendix E). Of the 10 census tracts in the study area, two have a minority population in excess of 50 percent as well as a higher minority population than Casa Grande. Five of the census tracts have a higher minority population than Pinal County (U.S. Census Bureau 2010). More than 50 percent of population in one of the 10 census tracts is age 60 or older. Therefore, protected populations exist in the study area. Further analysis to identify elderly populations, persons with disabilities, female heads of household, and low-income households will occur to support the NEPA documentation.

### *Environmental Concerns and Recommendations for Further Analysis*

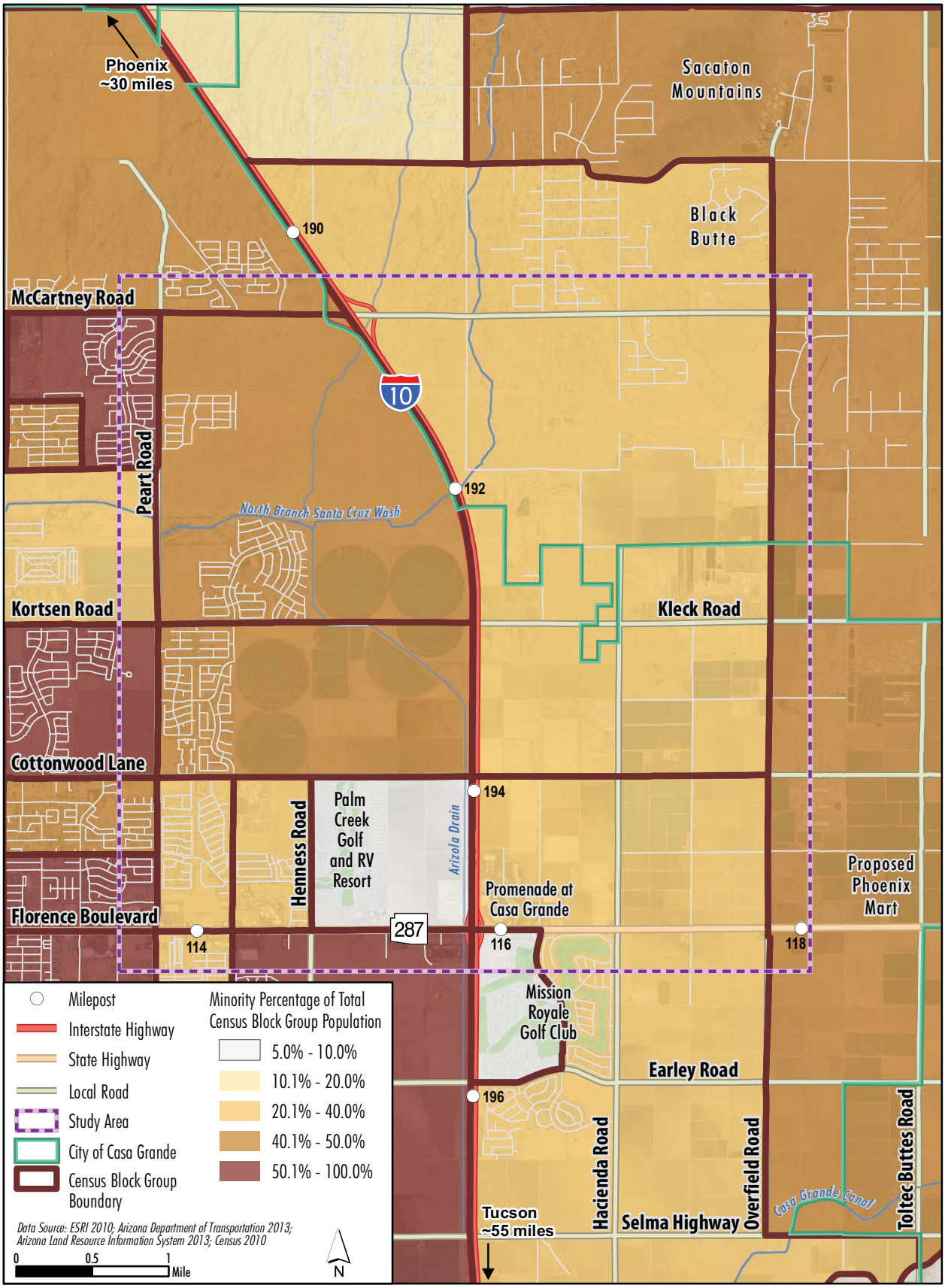
The relatively high percentage of minority population throughout the study area makes it likely that any future traffic interchange or widening of arterial streets would affect protected populations. Environmental justice factors that could differentiate the viability of alternatives in the study area include potential for displacements or relocations, traffic noise, and access changes to residences and businesses that may be owned or chiefly patronized by minority populations.

In an environmental justice analysis, impacts borne equally by the traveling public, such as traffic delays or slower speeds, are typically not included when determining effects on protected populations. However, effects to access and neighborhood continuity are considered.

It is recommended that targeted outreach be undertaken during the NEPA process to further identify protected populations and provide opportunities for such populations to participate meaningfully in the project development process. It is also recommended that a community of comparison be defined as part of the NEPA document to further refine the environmental justice and Title VI analysis. Continued coordination with the lead environmental agency would determine whether to adhere to the source and categories of environmental justice data to be analyzed.

Overall, environmental justice impacts may not necessarily contribute to establishing differences among possible alternatives that may occur in the study area. However, potential differences in impacts on environmental justice communities should be addressed when screening and comparing alternatives.

**Figure 11 2010 Minority Population Percentage by Census Block Group**



## Visual Resources

### *Affected Environment*

The visual character of the study area varies from a developed suburban/commercial setting in the southwestern portion of the study area to agricultural fields in the central and southeastern portion, to undeveloped areas in most of the northern portion of the study area. There are no designated scenic roads or byways located in the study area, nor do any land-managing agencies with visual impact requirements (e.g., Bureau of Land Management, National Park Service, and U.S. Forest Service) administer land in the study area.

I-10 is a dominant feature in the study area, particularly with the volume of traffic at all times of the day and night because movement tends to attract visual attention. The pattern of major arterial roads also contributes to the visual environment.

Generally undeveloped terrain and the foothills of the Sacaton Mountains to the northeast dominate natural views in the northern third of the study area. Vegetation in the undeveloped portions of the study area is sparse and predominately consists of low shrubs and trees. Overall, the terrain in the study area is flat to gently sloping.

Commercial/residential development characterizes much of the southwestern portion of the study area and a rural environment dominates in the central and southeastern portions. The agricultural portion of the study area features open land with low-growing crops, rural residential properties, and dairies.

### *Environmental Concerns and Recommendations for Further Analysis*

While there is variability in the visual environment within the study area, no designated scenic or sensitive view points were identified. Visual resources may contribute to establishing differences among possible alternatives that may occur in the study area with regard to locations in an undeveloped versus rural or developed area. However, because of the extent of visual modification that has already occurred in the study area, potential differences in impacts on visual resources are not anticipated to be a critical factor when screening and comparing alternatives.

## Right-of-Way

### *Affected Environment*

In the study area, ADOT owns the approximately 300-foot-wide ROW for I-10 across privately owned parcels, and holds an easement where I-10 crosses land under the jurisdiction of ASLD. ADOT also holds the ROW for SR 287, which varies from 73 to 80 feet wide east of I-10 and is approximately 150 feet wide west of I-10. The ROW for most major arterial roads is owned by Casa Grande, although some ROWs appear to be privately owned. Therefore, ROW may need to be acquired not only to construct, operate, and maintain the proposed traffic interchange but also to accommodate the adjacent road segments leading to and from the traffic interchange.

### *Environmental Concerns and Recommendations for Further Analysis*

A detailed analysis of ROW needs is recommended prior to final design of any future project in the study area. Rights-of-way or easements would need to be obtained prior to any roadway reconstruction or

widening. Temporary and permanent construction ROWs and easements would also be included in the footprint used for future technical analyses and NEPA documentation.

### Utilities

#### *Affected Environment*

Based on Blue Stake records and utility maps, the types of utilities in the study area include communication lines, electric lines, water lines, sewer lines, gas lines, coaxial and fiber optic cable, street lights, traffic signals, and culverts and storm drains. Most utilities follow the arterial streets. The utilities are managed, operated, and maintained by a number of entities including Casa Grande Public Works, ADOT, Arizona Public Service Company, Arizona Water Company, Century Link, Cox Communications, El Paso Natural Gas, Electrical District No. 2, San Carlos Irrigation Project, and Southwest Gas.

#### *Environmental Concerns and Recommendations for Further Analysis*

Construction activities along primary roads and some of the secondary roads would likely involve one or more of the utilities identified above. It is likely that utility relocations would be required for development of a traffic interchange or the potential for associated street widening requirements in the study area. Additional investigation into the degree of impact is recommended, and any needed relocation or service interruptions would be evaluated in coordination with utility companies. Utility work must be included in the footprint used for future technical analyses and NEPA documentation

## *Cultural Resources*

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

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

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 listing if they are of exceptional importance (NRHP criteria consideration G). To be considered eligible for listing in the NRHP, a property must meet at least one of the following criteria:

A. Is associated with events that have made a significant contribution to the broad patterns of our history,

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

The project will also need to comply with state preservation laws including the State Historic Preservation Act of 1982 (ARS §§ 41-861 through 41-864) and the Arizona Antiquities Act (ARS §§ 41-841 through 41-847). The State Historic Preservation Act of 1982 stipulates that the state agencies work to identify and preserve significant historic properties and provide the Arizona SHPO an opportunity to comment on any agency plans that affect properties listed or eligible for listing on the Arizona Register of Historic Places. The Arizona Antiquities Act prohibits excavation of historic or prehistoric sites on lands owned or controlled by the State of Arizona or local governments without a permit and directs those in charge of activities on such lands to notify the director of the Arizona State Museum (ASM) of the discovery of any archaeological sites, historical resources, and human remains (ASM 2013).

*Affected Environment*

Archival research and record searches were conducted at the AZSITE cultural resource database only. The AZSITE records search identified 41 prior archaeological projects within the current study area. Prior project surveys are listed in Table F-1 in Appendix F. The records search also identified 12 previously recorded cultural resource sites in the study area, which are listed in Appendix F, Table F-2. The known cultural resources sites consisted of:

- Seven prehistoric artifact scatters,
- One multi-component site comprised of a prehistoric and historic artifact scatter,
- One historic artifact scatter,
- One historic road,
- One historic homestead, and
- One historic natural gas line.

NRHP eligibility recommendations of properties identified in Appendix F, Table F-2 were based solely on information found on the AZSITE cultural resources database. In one instance (a prehistoric Hohokam artifact scatter, AZ AA:2:171 [ASM]), an eligibility recommendation was offered by the recorder but a determination by an agency has not been made. In the instance of a multi-component site consisting of a prehistoric Hohokam artifact scatter and historic O'odham artifact scatter (AZ AA:2:137 [ASM]), no evaluation for inclusion in the NRHP has occurred. Information regarding the eligibility statuses of two sites is unknown. Sites listed as "determined not eligible" or "determined eligible" suggests that some consultation has occurred as a result of past projects; however, specific information is not available.

As project planning progresses, additional cultural resources research and inventory will likely be required. Efforts to arrive at definitive eligibility assessments, including assessing whether the portions of eligible properties subject to potential effects are contributing or non-contributing, is required. It is probable that an agreement document (a memorandum of agreement or a programmatic agreement) will be developed to demonstrate Section 106 compliance. If a build alternative is selected as the preferred alternative, FHWA then would need to determine what effect construction and operation of

that alternative would have on historic properties. The three possible effect determinations are "no historic properties affected," "no adverse effect," and "adverse effect."

### *Environmental Concerns and Recommendations for Further Analysis*

#### General Recommendations for All Resources

Additional cultural resource research and inventory will be required during the NEPA process. Efforts to obtain specific eligibility criteria and to arrive at definitive eligibility assessments, including assessing whether the portions of eligible properties subject to potential effects are contributing or non-contributing, would also be required. It is possible that an agreement document (a memorandum of agreement or a programmatic agreement) would be developed to demonstrate Section 106 compliance. When the area of potential effect (APE) is better defined, it would be necessary to conduct cultural resource surveys, according to current ASM guidelines, for all portions of the APE that have not been previously surveyed or that were surveyed within in the previous 10 years.

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

#### Archaeology

The results of the Class I inventory conducted for this study and other previous cultural resource investigations indicate the potential for encountering additional prehistoric and historic cultural resource sites within the study area. Comprehensive information about the potential presence of adjacent historic roads or historic structures (e.g., ranches and bridges) was not available for the records search. Additional work is necessary to identify and evaluate adjacent historic properties.

It is recommended that the three sites determined NRHP-eligible be avoided, if possible. If avoidance is not possible, any adverse impacts would be mitigated through an appropriate program of archival research, documentation, or data recovery excavations and/or ethnographic research.

Additional archival research, ethnographic research, and/or further documentation are recommended for sites that have not been evaluated for NRHP-eligibility and sites with unknown NRHP-eligibility status. It is recommended that these sites be avoided. These sites would require further evaluation if avoidance is not an option.

Potentially affected areas not previously subjected to survey or areas that have been surveyed more than 10 years ago would be subjected to a cultural resource pedestrian survey in accordance with current ASM guidelines. Approximately half of the previous surveys are more than 10 years old and will likely not be considered sufficient for new consultation.

### Section 106 Compliance Process

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

- ADOT
- FHWA
- ASLD
- SHPO
- Casa Grande
- Pinal County
- Gila River Indian Community
- Hopi Tribe
- Pascua Yaqui Tribe
- San Carlos Apache Nation
- Tohono O'odham Nation
- White Mountain Apache Tribe
- Yavapai-Apache Nation

## Environmental Overview Conclusion

The evaluation of social, economic, and environmental resources in the study area identified a number of issues that could potentially influence the selection of viable alternatives evaluated in the study area. For example, a given alternative could result in environmental impacts that would render it infeasible when compared to a different alternative with fewer impacts. Focused and detailed analysis and documentation, stakeholder participation, and development of mitigation measures would occur during preparation of the NEPA documentation. The process would follow NEPA (42 U.S.C. 4321–4347) (NEPA 1970), as implemented by the Council on Environmental Quality (CFR Title 40, Part 1508.8), and FHWA guidelines (CFR Title 23, Part 771).

Table 6 summarizes the resources within the study area and lists recommendations for further analysis. The "Alternatives Selection Criteria" column defines which resources are recommended as critical factors to be included in the multidisciplinary criteria used to evaluate future projects or compare future alternatives.

**Table 6 Summary of Resources and Recommendations for Further Analysis**

| Resource | Existing Conditions | Further Analysis | Alternatives Selection Criteria |
|---|---|---|---|
| Topography/ Physiography | • Relatively flat<br>• Sacaton Mountains to northeast<br>• Minimal subsidence, faults, or drainages | • None recommended<br>• Avoid large cuts/fills and fault lines | Not a critical factor |

**Table 6 Summary of Resources and Recommendations for Further Analysis**

| Resource | Existing Conditions | Further Analysis | Alternatives Selection Criteria |
|---|---|---|---|
| Native Vegetation/ Plant Communities | • Lower Colorado River Valley subdivisions of Sonoran desertscrub<br>• Protected native plants | • Minimize vegetation removal<br>• Implement invasive species mitigation measures<br>• Coordinate with Arizona Department of Agriculture for protected native plant salvage | Include in criteria used to screen/compare |
| Biology/Wildlife | • Desert tortoise (Sonoran population)<br>• Acuña cactus<br>• Western burrowing owl<br>• Tucson shovel-nosed snake | • Additional USFWS and AGFD coordination<br>• Biological Evaluation for agency review | Include in criteria used to screen/compare (wildlife connectivity not a critical factor) |
| Hydrology | • 100-year floodplains<br>• Potential wetlands<br>• Waters of the US<br>• Registered wells | • Coordinate with affected agencies and landowners<br>• Proceed with permits as required (Letter of Map Revision, Section 401/402/ 404, etc.) | Include in criteria used to screen/compare |
| Prime and Unique Farmlands | • Prime or unique farmlands in 99 percent of the study area | • Determine extent to which FPPA applies<br>• Coordinate with NRCS and local governments | Include in criteria used to screen/compare |
| Noise | • Noise-sensitive receptors (residences, recreation areas, schools, etc.) | • Noise modeling and abatement evaluation | Include in criteria used to screen/compare |
| Air Quality | • $PM_{10}$ non-attainment area | • Qualitative $PM_{10}$ hotspot analysis | Not a critical factor |
| Hazardous Materials | • Known hazardous materials sites | • Avoid where possible<br>• Additional location-specific evaluation depending on alternatives and new ROW acquisition | Include in criteria used to screen/compare |
| Section 4(f) | • Three parks<br>• Four schools<br>• 11 planned parks/trails<br>• One planned trailhead<br>• One historic property | • Coordinate with jurisdictions to determine availability and local significance of potential resources<br>• Avoid impacts to Section 4(f) resources | Include in criteria used to screen/compare |

**Table 6 Summary of Resources and Recommendations for Further Analysis**

| Resource | Existing Conditions | Further Analysis | Alternatives Selection Criteria |
|---|---|---|---|
| Land Use, Ownership, Jurisdiction | • Pinal County<br>• Arizona State Land Department<br>• Casa Grande | • Evaluate alternatives for conformance with land use plans and zoning | Include in criteria used to screen/compare |
| Socioeconomics | • Existing residential and commercial neighborhoods and employers | • Evaluate potential for displacements, relocations, and impacts to neighborhood continuity and community cohesion | Include in criteria used to screen/compare |
| Title VI/ Environmental Justice | • Existing protected populations | • Identify community of comparison and impacts to protected populations, and conduct environmental justice analysis<br>• Conduct targeted outreach to identify protected populations and provide opportunities for meaningful input | Include in criteria used to screen/compare |
| Visual Resources | • Rural environment transitioning to developed environment | • Consider site-specific impacts, but overall not a critical concern | Not a critical factor |
| Right-of-Way | • ADOT ROWs along I-10 and SR 287<br>• City of Casa Grande ROWs along most major arterial roads, although some are privately owned | • Further investigate temporary and permanent construction ROWs and easements | Not a critical factor |
| Utilities | • Includes gas, power, and communication lines above and below ground<br>• Spread throughout the study area | • Investigate potential utility impacts, relocations, and service interruptions<br>• Include utility construction in environmental analysis and documentation | Include in criteria used to screen/compare |

**Table 6 Summary of Resources and Recommendations for Further Analysis**

| Resource | Existing Conditions | Further Analysis | Alternatives Selection Criteria |
|---|---|---|---|
| Cultural Resources | • 12 cultural resource sites previously recorded on AZSITE based on 41 prior project surveys | • Complete literature review to determine known site eligibility and additional survey requirements<br>• Conduct consultation based on alternatives and impacts | Include in criteria used to screen/compare |

# Consultation/Coordination

## *Coordination*

A study kick-off meeting for representatives of Casa Grande, ADOT, Pinal County, City of Coolidge, and El Paso Gas/Kinder Morgan was held on October 23, 2013 at the Council Chambers in Casa Grande. The meeting provided an opportunity to discuss study goals and objectives; an overview of the study; issues, concerns, and opportunities; and project administration. Some of the concerns identified during the meeting included the time needed to relocate utilities, the need for coordination with FEMA if floodplains would be affected, the need to consider land use changes that could affect the traffic model, and the lack of current funding to implement the project.

On December 16, 2013, representatives of Casa Grande and ADOT met at ADOT to review the growth projections, the first part of the Planning and Environmental Linkages questionnaire and checklist, the public involvement plan, and next steps. A more detailed discussion of the growth projections occurred on January 13, 2014 at the Casa Grande North Operations Center. Traffic projections were reviewed with ADOT on March 24, 2014.

## *Public Involvement*

A public involvement plan has been prepared and includes the following goals:

- Develop general public understanding of the study
- Provide opportunities for public, agency, and local government participation in the decision-making process
- Engage the public
- Involve the news media to maximize the potential for informed coverage

Public and agency scoping is planned for spring 2014. The public meetings will be advertised in local newspapers and through social media such as Casa Grande's Facebook page and Twitter feed.

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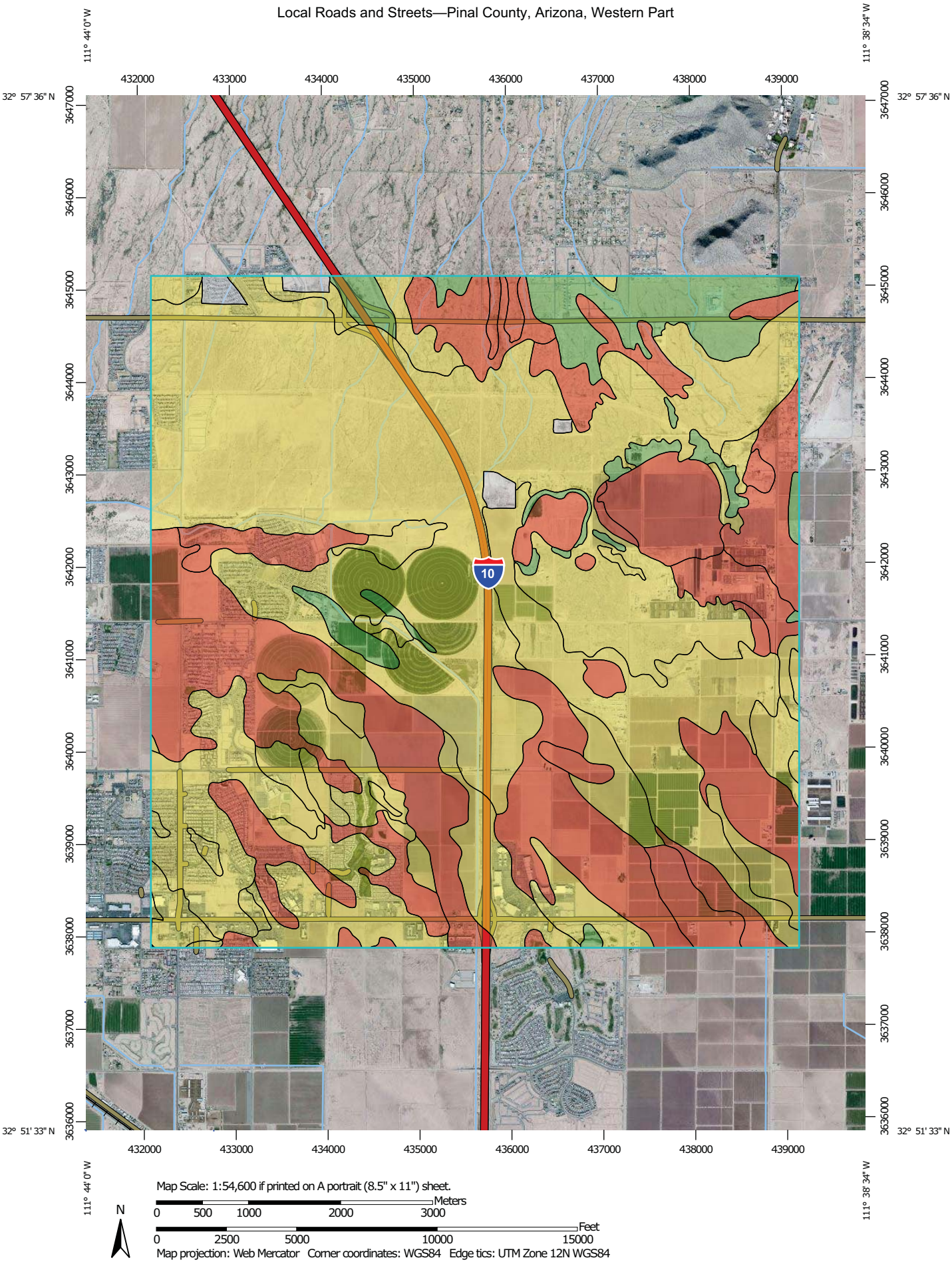
**APPENDIX A**

Soil Suitability Rating Information
for Local Roads and Streets

# Local Roads and Streets—Pinal County, Arizona, Western Part



## MAP LEGEND

**Area of Interest (AOI)**

Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

Very limited

Somewhat limited

Not limited

Not rated or not available

**Soil Rating Lines**

Very limited

Somewhat limited

Not limited

Not rated or not available

**Soil Rating Points**

Very limited

Somewhat limited

Not limited

Not rated or not available

**Water Features**

Streams and Canals

**Transportation**

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

**Background**

Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pinal County, Arizona, Western Part
Survey Area Data: Version 9, Dec 15, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 3, 2010—Nov 27, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Local Roads and Streets

| Local Roads and Streets— Summary by Map Unit — Pinal County, Arizona, Western Part (AZ659) | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| 3 | Casa Grande fine sandy loam | Somewhat limited | Casa Grande (85%) | Shrink-swell (0.31) | 4,893.8 | 38.5% |
| 4 | Casa Grande clay loam | Somewhat limited | Casa Grande (85%) | Shrink-swell (0.50) | 809.1 | 6.4% |
| 16 | Denure sandy loam, 1 to 3 percent slopes | Not limited | Denure (85%) | | 604.3 | 4.8% |
| 17 | Denure fine sandy loam, 0 to 1 percent slopes | Not limited | Denure (85%) | | 10.8 | 0.1% |
| 19 | Dumps-Pits association | Not rated | Dumps (59%) | | 87.9 | 0.7% |
| | | | Pits (29%) | | | |
| 20 | Gadsden clay | Very limited | Gadsden (85%) | Shrink-swell (1.00) | 288.0 | 2.3% |
| | | | | Flooding (1.00) | | |
| | | | | Low strength (1.00) | | |
| 23 | Ginland clay | Very limited | Ginland (95%) | Flooding (1.00) | 1,440.7 | 11.3% |
| | | | | Shrink-swell (1.00) | | |
| 30 | Mohall sandy loam | Somewhat limited | Mohall (85%) | Shrink-swell (0.16) | 1,230.6 | 9.7% |
| 31 | Mohall loam MLRA 40 | Very limited | Mohall (80%) | Low strength (1.00) | 1,106.5 | 8.7% |
| | | | | Shrink-swell (0.05) | | |
| 32 | Mohall clay loam | Somewhat limited | Mohall (90%) | Shrink-swell (0.50) | 894.8 | 7.0% |
| 40 | Rositas loamy fine sand | Not limited | Rositas (95%) | | 136.5 | 1.1% |
| 43 | Toltec fine sandy loam | Not limited | Toltec (90%) | | 22.5 | 0.2% |
| 45 | Trix clay loam | Very limited | Trix (90%) | Flooding (1.00) | 721.6 | 5.7% |
| | | | | Shrink-swell (0.50) | | |
| | | | | Low strength (0.22) | | |
| 48 | Valencia sandy loam | Very limited | Valencia (95%) | Flooding (1.00) | 258.6 | 2.0% |

| Local Roads and Streets— Summary by Map Unit — Pinal County, Arizona, Western Part (AZ659) | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| 49 | Why sandy loam | Very limited | Why (90%) | Flooding (1.00) | 210.0 | 1.7% |
| **Totals for Area of Interest** | | | | | **12,715.6** | **100.0%** |

| Local Roads and Streets— Summary by Rating Value | | |
|---|---|---|
| **Rating** | **Acres in AOI** | **Percent of AOI** |
| Somewhat limited | 7,828.3 | 61.6% |
| Very limited | 4,025.3 | 31.7% |
| Not limited | 774.1 | 6.1% |
| Null or Not Rated | 87.9 | 0.7% |
| **Totals for Area of Interest** | **12,715.6** | **100.0%** |

## Description

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* *None Specified*

*Tie-break Rule:* Higher

**APPENDIX B**

Mobile Source Air Toxics
Background Information

# A. Mobile Source Air Toxics

MSATs from highway vehicles and non-road equipment are the result of toxic compounds contained in fuel that are emitted into the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. Of the 93 MSATs that are listed in their Integrated Risk Information System (IRIS), a subset of seven compounds has been designated by the EPA as priority MSATs and are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA).[4,5] These are acrolein; benzene; 1,3 butadiene; diesel particulate matter plus diesel exhaust organic gases (diesel particulate emissions); formaldehyde; naphthalene; and polycyclic organic matter.

The EPA is the lead federal agency for administering the 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. Based on a FHWA analysis using EPA's MOVES2010b model, as shown on Figure B-1, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period. This is because future reductions realized by new cleaner burning vehicles operating on reformulated fuels would replace older vehicles and are anticipated to significantly offset future increases in emissions associated with a larger fleet size and increased VMT (FHWA 2012).

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

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

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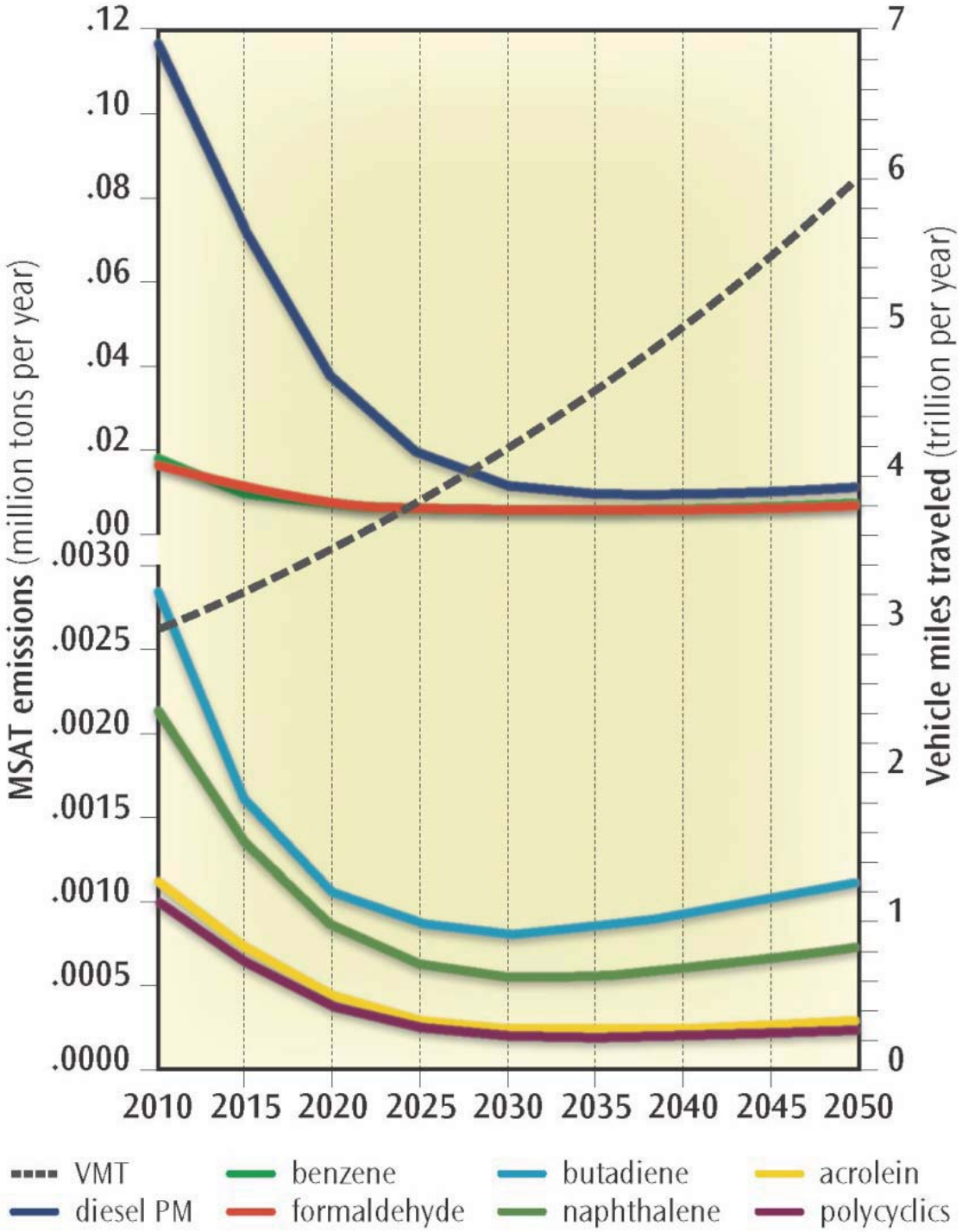
[4] U.S. Environmental Protection Agency (EPA). 2014a. *Integrated Risk Information System (IRIS).* Website: http://cfcpub.epa.gov/ncea/iris/index.cfm. Accessed February 15, 2014.

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

**Figure B-1. Projected National MSAT Emission Trends 2010 to 2050 for Vehicles Operating on Roadways Using EPA's MOBILE2010b Model**




Trends for specific locations may be different, depending on locally derived information representing vehicle miles traveled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

The hydrocarbon reductions from the vehicle and gas can standards will reduce volatile organic compound emissions (which are precursors to O3 and can be precursors to $PM_{2.5}$) by more than 1 million tons in 2030. The vehicle standards should reduce direct $PM_{2.5}$ emissions by 19,000 tons in 2030 and could also reduce secondary formation of $PM_{2.5}$. Once the regulation is fully implemented, EPA estimates that these PM reductions will prevent nearly 900 premature deaths annually (EPA 2007).[6]

### *Motor Vehicle Emissions Simulator (MOVES)*

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

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

### *MSAT Research*

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

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

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

This environmental overview includes a basic analysis of the likely MSAT emission impacts of future projects in the study area. However, available technical tools do not enable us to predict the project-

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

specific health impacts of the emission changes associated with this study corridor. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality regulations (CFR Title 40, Part 1502.22[b]) regarding incomplete or unavailable information.

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

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects".[7] Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations or in the future as vehicle emissions substantially decrease.[8,9]

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

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

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

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

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

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA and the HEI have not established a basis for quantitative risk assessment of diesel PM in ambient settings.[10,11]

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

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

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

[10] HEI. 2009. *A Special Report of the Institute's Panel on the Health Effects of Traffic-Related Air Pollution*. Website: http://pubs.healtheffects.org/view.php?id=306. Accessed on February 15, 2014.
[11] HEI. 2007b. *Summary of Studies of Diesel Exhaust.* Website: http://pubs.healtheffects.org/getfile.php?u=395. Accessed February 15, 2014.

**APPENDIX C**

Hazardous Materials and
Recognized Environmental Conditions

**Table C-1 Potential Hazardous Materials Risk in the Study Area**

| Name and Location | Listing | Ranking | EO Stage Recommendation |
|---|---|---|---|
| **Environmental Database Listings** | | | |
| Aspen Dental<br>1775 East Florence Boulevard Casa Grande, AZ 85122 | RCRA CESQG active | Corridor: low<br>Take: medium/high | None |
| CVS Pharmacy #0086<br>1686 East Florence Boulevard Casa Grande, AZ 85122 | RCRA CESQG active | Corridor: low<br>Take: medium | None |
| Desert Reflections Imaging<br>1828 East Florence Boulevard Casa Grande, AZ 85222 | RCRA Info Unavailable | Corridor: low<br>Take: medium/high | **Avoid** |
| Home Depot 0408<br>1546 East Florence Boulevard Casa Grande, AZ 85222 | RCRA SQG active | Corridor: low<br>Take: high | **Avoid** |
| Lowes HIW 2272<br>1436 East Florence Boulevard Casa Grande, AZ 85222 | RCRA Info Unavailable | Corridor: low<br>Take: medium/high | None |
| M & G Casa Grande LLC<br>2245 East Florence Boulevard Casa Grande, AZ 85222 | RCRA Info Unavailable<br>4 USTs open | Corridor: low<br>Take: medium | None |
| Prestige Station 5429<br>2245 East Florence Boulevard Casa Grande, AZ 85222 | RCRA Info Unavailable | Corridor: low<br>Take: low | None |
| Promenade Smiles<br>808 North Mission Parkway Casa Grande, AZ 85194 | RCRA Info Unavailable | Corridor: low<br>Take: medium | None |
| Target Store # T2353<br>951 North Promenade Parkway Casa Grande, AZ | RCRA LQG active | Corridor: low<br>Take: high | **Avoid** |
| Walmart Supercenter #1218<br>1741 East Florence Boulevard Casa Grande, AZ 85222 | RCRA SQG active | Corridor: low<br>Take: high | **Avoid** |
| Casa Grande Regional Medical Center<br>1800 East Florence Boulevard Casa Grande, AZ 85122 | 2 USTs open<br>RCRA SQG active | Corridor: low<br>Take: medium/high | None |
| Circle K #2931<br>1441 East Florence Boulevard Casa Grande, AZ 85122 | 4 LUSTs closed | Corridor: low<br>Take: medium/high | None |

**Table C-1 Potential Hazardous Materials Risk in the Study Area**

| Name and Location | Listing | Ranking | EO Stage Recommendation |
|---|---|---|---|
| **Environmental Database Listings** | | | |
| Discovery Chevron<br>2128 East Florence Boulevard Casa Grande, AZ 85122 | 2 USTs open | Corridor: low<br>Take: medium/high | None |
| Trejo Express Stop<br>2234 East Florence Boulevard Casa Grande, AZ 85122 | 6 LUSTs closed | Corridor: low<br>Take: medium/high | None |

AZ = Arizona
CESQG = Conditionally Exempt Small Quantity Generator
LQG = Large Quantity Generator
LUST = Leaking Underground Storage Tank
RCRA = Resource Conservation and Recovery Act
SQG = Small Quantity Generator
UST = Underground Storage Tank

**APPENDIX D**

Possible Section 4(f) Resources

**Table D-1 Possible Section 4(f) Resources in the Study Area**

| Map ID | Resource | Location/Proximity | Jurisdiction or Owner | Features | Recommended Status[a] |
|---|---|---|---|---|---|
| **Existing Schools** | | | | | |
| 1 | Desert Willow Elementary School | North of Kortsen Road, west of Henness Road; within study area | Casa Grande Elementary School District | Two playgrounds; two ball fields | Potential |
| 2 | Vista Grande High School | South of Cottonwood Lane, west of Henness Road; within study area | Casa Grande Union High School District | Outdoor track, ball fields | Potential |
| 3 | Ironwood Elementary School | South of Cottonwood Lane, west of Peart Road; within 0.25-mile buffer around study area | Casa Grande Elementary School District | Playground area that incorporates a ball field | Potential |
| 4 | Mesquite Elementary School | South of SR 287 (Florence Boulevard), east of Peart Road; within 0.25-mile buffer around study area | Casa Grande Elementary School District | Playground area; two baseball fields | Potential |
| **Existing Parks** | | | | | |
| 5 | Ivy Ranch Park | South of Cottonwood Land, east of Peart Road; within study area | City of Casa Grande Community Services Department | Grass open space | Yes |
| 6 | Colony Park | South of SR 287 (Florence Boulevard), west of Peart Road; within study area | City of Casa Grande Community Services Department | Walking trail, grass open space | Yes |
| 7 | Sierra Ranch Park | South of SR 287 (Florence Boulevard), west of Henness Road; within 0.25-mile buffer around study area | City of Casa Grande Community Services Department | Children's playground equipment, grass open space | Yes |
| [b] | Mission Valley Unit I parks | North of Kortsen Road, west of Henness Road; within study area | Mission Valley Homeowner's Association | Five community parks, multi-use paths | No, not publicly owned |

**Table D-1 Possible Section 4(f) Resources in the Study Area**

| Map ID | Resource | Location/Proximity | Jurisdiction or Owner | Features | Recommended Status[a] |
|---|---|---|---|---|---|
| | Monterra Village | South of Kortsen Road, east of Peart Road; within study area | Monterra Village Homeowner's Association | Community park, multi-use trails | No, not publicly owned |
| **Planned Trails and Multi-Use Paths[b]** | | | | | |
| 8 | T-7 North Mountain Park Access Trail[c] | North and east of I-10; within the study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| 9 | T-12 Pipeline Trail | West of I-10; within study area | City of Casa Grande Community Services Department | Planned, also identified by Pinal County as a multi-use trail corridor; undeveloped | Potential |
| 10 | T-11 McCartney Trail | South of McCartney Road; within study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| 11 | T-19 Gasline Trail | South of McCartney Road; within study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| 12 | LP-1 Casa Grande Linear Park - North Branch segment | Roughly parallel to the North Branch of the Santa Cruz Wash; within study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| 13 | ST-2 Henness Spur Trail | Roughly parallel to the Henness Road alignment north and south of Kortsen Road; within study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| 14 | ST-1 Cottonwood Spur Trail | Roughly parallel to Cottonwood Lane between Henness Road and west of I-10; within study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |

**Table D-1 Possible Section 4(f) Resources in the Study Area**

| Map ID | Resource | Location/Proximity | Jurisdiction or Owner | Features | Recommended Status[a] |
|---|---|---|---|---|---|
| 15 | T-4 Storey Lane Trail | Roughly parallel to Cottonwood Lane between the west side of I-10 and Overfield Road; within study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| 16 | LP-2 Casa Grande Linear Park - I-10 Segment | Parallel to the west side of I-10 south of the North Branch of the Santa Cruz Wash; within study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| 17 | T-3 Hacienda - Overfield Trail | Roughly parallel to Overfield Road; within study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| 18 | ST-3 Muirlands Spur Trail | West of Peart Road, north and south of Kortsen Road; within 0.25-mile buffer around study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| **Planned Trailhead** | | | | | |
| 19 | TH-7 Cottonwood Trailhead | Along Cottonwood Lane, west of I-10; within study area | City of Casa Grande Community Services Department | Planned; undeveloped | Potential |
| **Historical Sites** | | | | | |
| 20 | El Paso Natural Gas Pipeline No. 1007 | South of McCartney Road; within study area | SHPO | Historic American natural gas line | Potential |

**Table D-1 Possible Section 4(f) Resources in the Study Area**

| Map ID | Resource | Location/Proximity | Jurisdiction or Owner | Features | Recommended Status[a] |
|---|---|---|---|---|---|
| **Recreation Facilities** | | | | | |
| | Palm Creek Golf and RV Resort | South of Cottonwood Lane, east of Henness Road; within study area | Sun RV Resorts | 18-hole golf course, tennis courts, craft building, swimming pool, activity building | No, not publically owned |
| | Mission Royale Golf Course | South of Florence Boulevard, east of I-10; partially within study area and partially within 0.25-mile buffer around study area | Mission Royale/ Meritage Homes | 18-hole golf course, driving range, clubhouse/ amenity center, swimming pools tennis courts | No, not publically owned |

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

[b] Properties determined during this evaluation as not Section 4(f) resources are not shown on Figure 9.

[c] Codes such as “T-7” are the trail numbers assigned in *Casa Grande Regional Trail System Master Plan* (2008). T=trail; TH=trailhead; LP=linear park; ST=spur trail.

**APPENDIX E**

Census Data

**Table E-1 Racial and Ethnic Population Characteristics in the Study Area**

| Area | Total Population | White | | African American | | American Indian | | Asian | | Pacific Islander | | Other Race | | Two or More Races | | Hispanic [a] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | # | % | # | % | # | % | # | % | # | % | # | % |
| CT12 | 4,543 | 3,337 | 73.5 | 215 | 4.7 | 172 | 3.8 | 17 | 0.4 | 2 | 0.0 | 648 | 14.3 | 152 | 3.3 | 1,475 | 32.5 |
| CT13.03 | 1,340 | 1,152 | 86.0 | 15 | 1.1 | 24 | 1.8 | 16 | 1.2 | 0 | 0.0 | 118 | 8.8 | 15 | 1.1 | 333 | 24.9 |
| CT13.04 | 8,772 | 6.316 | 72.0 | 458 | 5.2 | 226 | 2.6 | 281 | 3.2 | 15 | 0.2 | 1,079 | 12.3 | 397 | 4.5 | 2,949 | 33.6 |
| CT13.05 | 5,331 | 3,867 | 72.5 | 196 | 3.7 | 221 | 4.1 | 93 | 1.7 | 3 | 0.1 | 760 | 14.3 | 191 | 3.6 | 1,756 | 32.9 |
| CT13.06 | 5,179 | 3,116 | 60.2 | 221 | 4.3 | 316 | 6.1 | 87 | 1.7 | 5 | 0.1 | 1,009 | 19.5 | 425 | 8.2 | 2,298 | 44.4 |
| CT14.04 | 3,809 | 2,640 | 69.3 | 143 | 3.8 | 128 | 3.4 | 108 | 2.8 | 5 | 0.1 | 546 | 14.3 | 239 | 6.3 | 1.432 | 37.6 |
| CT14.05 | 3,801 | 3,107 | 81.7 | 138 | 3.6 | 97 | 2.6 | 64 | 1.7 | 6 | 0.2 | 257 | 6.8 | 132 | 3.5 | 815 | 21.4 |
| CT14.06 | 4,827 | 2,390 | 49.5 | 320 | 6.6 | 445 | 9.2 | 21 | 0.4 | 6 | 0.1 | 1,359 | 28.1 | 287 | 5.9 | 2,917 | 60.4 |
| CT14.07 | 1,781 | 1,285 | 72.2 | 48 | 2.7 | 49 | 2.8 | 35 | 2.0 | 7 | 0.4 | 286 | 16.1 | 71 | 4.0 | 756 | 42.4 |
| CT14.08 | 1,919 | 1,662 | 86.6 | 39 | 2.0 | 35 | 1.8 | 39 | 2.0 | 8 | 0.4 | 107 | 5.6 | 29 | 1.5 | 237 | 12.4 |
| Casa Grande | 48,571 | 32,687 | 67.3 | 2,245 | 4.6 | 2,232 | 4.6 | 875 | 1.8 | 87 | 0.2 | 7,953 | 16.4 | 2,492 | 5.1 | 18,932 | 39.0 |
| Pinal County | 375,770 | 272,013 | 72.4 | 17,215 | 4.6 | 20,949 | 5.6 | 6,492 | 1.7 | 1,565 | 0.4 | 43,213 | 11.5 | 14,323 | 3.8 | 106,977 | 28.5 |

Source: U.S. Census Bureau, 2010 Census Summary File 1.

CT = Census tract, # = Number, % = Percentage.

[a] "Hispanic" refers to ethnicity and is derived from the total population, not as a separate race; that is, it is calculated differently from the other columns in this table.

**Table E-2 Environmental Justice and Title VI Population Characteristics in the Study Area**

| Area | Total Population | Total Minority[a] | | Ages 60 and Older | | Total Civilian Non-Institu-tionalized Population | Disabled[b] | | Total Population for Whom Poverty Level is Determined | Below Poverty Level | | Households | Female Head of Household | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | # | % | # | % | | # | % | | # | % | | # | % |
| CT12 | 4,543 | 1,853 | 40.8 | 1,240 | 27.3 | 5,429 | 850 | 15.7 | 4,840 | 974 | 10.1 | 1,632 | 288 | 17.6 |
| CT13.03 | 1,340 | 384 | 28.7 | 303 | 22.6 | 962 | 172 | 17.9 | 961 | 71 | 7.4 | 512 | 80 | 15.6 |
| CT13.04 | 8,772 | 3,964 | 45.2 | 1,170 | 13.3 | 8,081 | 696 | 8.6 | 8,068 | 585 | 7.3 | 2,802 | 561 | 20.0 |
| CT13.05 | 5,331 | 2,291 | 43.0 | 1,240 | 23.3 | 6,205 | 547 | 8.8 | 6,219 | 851 | 13.7 | 2,034 | 392 | 19.3 |
| CT13.06 | 5,179 | 2,934 | 56.7 | 712 | 13.7 | 4,418 | 533 | 12.1 | 4,387 | 1,216 | 27.2 | 1,796 | 513 | 28.3 |
| CT14.04 | 3,809 | 1,812 | 47.6 | 656 | 17.2 | 3,701 | 408 | 11.0 | 3,726 | 339 | 9.1 | 1,288 | 295 | 22.9 |
| CT14.05 | 3,801 | 1,153 | 30.3 | 1,762 | 46.4 | 3,780 | 455 | 12.0 | 3,696 | 494 | 13.4 | 1,766 | 248 | 14.0 |
| CT14.06 | 4,827 | 3,600 | 74.6 | 651 | 13.5 | 5,067 | 966 | 19.1 | 5,047 | 1,495 | 29.6 | 1,610 | 483 | 30.0 |
| CT14.07 | 1,781 | 530 | 29.8 | 582 | 32.7 | 1,749 | 298 | 17.0 | 1,720 | 140 | 8.1 | 699 | 108 | 15.5 |
| CT14.08 | 1,919 | 373 | 19.4 | 1,101 | 57.4 | 1,611 | 185 | 11.5 | 1,611 | 129 | 8.0 | 912 | 95 | 10.4 |
| Casa Grande | 48,571 | 24,345 | 50.1 | 10,736 | 22.1 | 49,667 | 6,476 | 13.0 | 47,380 | 8,295 | 17.5 | 17,651 | 3,800 | 21.5 |
| Pinal County | 375,770 | 155,284 | 41.3 | 74,125 | 19.7 | 362,359 | 42,858 | 11.8 | 342,233 | 52,188 | 15.2 | 125,590 | 26,068 | 20.8 |

Sources: U.S. Census Bureau. 2010 Census Summary File 1. for Total, Minority, Age, and Household data, and 2006-2010 American Community Survey 5-Year Estimates for Poverty Status; U.S. Census Bureau. 2010-2014. American Community Survey. Disability Characteristics, 2010-2012 American Community Survey 3-Year Estimates.

CT = Census tract, # = Number, % = Percentage.

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

[b] The most recent disability data available at the census tract level is from Census 2000. Geographical divisions for Census 2000 data do not correspond to Census 2010 divisions.

**APPENDIX F**

Previous Cultural Resource Surveys,
Identified Cultural Resources,
and References Cited

**Table F-1 Previous Project Surveys in the Study Area**

| Project No. | Project Name | Location | Reference |
|---|---|---|---|
| 1976-25.ASM | ADOT Materials Pit #8533 | T6S, R6E, Section 12 | AZSITE |
| 1977-16.ASM | Materials Pit #8224 | T6S, R7E, Section 17 | AZSITE |
| 1985-226.ASM | All American Pipeline Right-of-way | T6S, R6E, Sections 1-3; T6S, R7E, Section 6 | Batcho1985 |
| 1985-238.ASM | CAP - Hohokam Irrigation District | T6S, R6E, Section 13; T6S, R7E, Sections 18-20 | Van Nimwegen and Hackbarth 1985 |
| 1990-177.ASM | Casa Grande Survey | T6S, R6E, Sections 15 and 22 | Euler 1990 |
| 1991-133.ASM | Casa Grande Buried Line | T6S, R6E, Section 2 | Adams 1991 |
| 1997-89.ASM | Casa Grande 69 kV Powerline Extension | T6S, R6E, Section 22 | Adams 1997a |
| 1997-90.ASM | Casa Grande 69 kV Powerline Extension | T6S, R6E, Section 15 | Adams 1997b |
| 1998-392.ASM | SR 287 Maint. Survey | T6S, R6E, Sections 22, and 23-27 | Woodall 1998 |
| 1998-439.ASM | I-10 (Milepost 175.8-226) | T5S, R6E, Section 36; T6S, R6E, Sections 2, 11, 12, 13, 23, and 24 | Barz and Neeley 1998 |
| 1998-540.ASM | SR 287 Oracle Maintenance | T6S, R6E, Sections 24 and 25; T6S, R7E, Sections 19 and 30 | Stone 2000 |
| 2000-459.ASM | Legacy Homes 313 Acres | T5S, R6E, Section 35 | Coriell and Courtright 2000 |
| 2000-588.ASM | Peart and Cottonwood | T6S, R6E, Section 22 | Kober 2001 |
| 2001-777.ASM | Arroyo Grande 140 Survey | T5S, R6E, Section 34 | Lundin 2001 |
| 2002-309.ASM | EPNG Crossover Line 20109 | T6S, R7E, Section 30 | Foster 2002 |
| 2003-474.ASM | EPNG Line 1007 Survey | T6S, R7E, Section 30 | Hesse 2003 |
| 2003-1070.ASM | EPNG Tucson Class III Survey | T6S, R7E, Section 30 | Hesse and Gutierrez 2004 |
| 2003-1185.ASM | SCIP McCartney Rd and Cox Rd Pole Installation Survey | T6S, R6E, Section 2 | Morgan 2001 |
| 2003-1196.ASM | Las Montanas Subdivision Line Survey | T6S, R7E, Section 5 | Mintmier 2002 |
| SHPO-2003-1871 | Site # PH59XC223B "Sharmila" MACTEC # 4973-03-1217.522 Sprint PCS | T6S, R7E, Section 30 | AZSITE |
| 2004-271.ASM | Mission Ranch | T6S, R6E, Section 3 | Kennedy 2003 |

**Table F-1 Previous Project Surveys in the Study Area**

| Project No. | Project Name | Location | Reference |
|---|---|---|---|
| 2004-370.ASM | SCIP Power Line Rehabilitation Batch #1 Survey | T5S, R7E, Sections 32 and 33 | Rodrigues 2003 |
| 2004-583.ASM | Peart Road | T6S, R6E, Sections 9 and 10 | Stone 2004 |
| 2004-724.ASM | Riggs Road - Picacho Peak Road | T5S, R6E, Sections 35 and 36; T6S, R6E, Sections 2-3 | Brodbeck and Touchin 2004 |
| 2004-1802.ASM | 61ac Arroyo Vista Arch | T6S, R6E, Section 4 | Schmidt and Lindly 2004 |
| 2004-1828.ASM | Peart Road and Cottonwood Lane Survey | T6S, R6E, Section 15 | Shaw 2003 |
| 2005-265.ASM | Cottonwood Lane and Peart Road Survey | T6S, R6E, Section 15 | Shaw 2002 |
| 2005-431.ASM | Arroyo Vista Unit 2 | T6S, R6E, Section 4 | Bellavia and Lindly 2005 |
| 2005-441.ASM | Casa Grande and Peart Road | T6S, R6E, Section 9 | Schroeder 2005 |
| 2005-697.ASM | Kortsen and Peart Roads Survey | T6S, R6E, Section 15 | Stahman 2005 |
| 2005-793.ASM | SR 287 Casa Grande ADOT Permit | T6S, R6E, Sections 24 and 25 | Potter 2005 |
| 2005-1283.ASM | Florence Boulevard and Peart Road | T6S, R6E, Section 21 | Moore 2005 |
| 2006-90.ASM | Southern Trails | T6S, R6E, Sections 11 and 12 | Boloyan 2005 |
| 2009-449.ASM | Overfield Rehab | T6S, R7E, Section 5 | Trakes and Goldstein 2009a |
| 2009-643.ASM | Casa Grande - Peart Road | T5S, R6E, Sections 34 and 35; T6S, R6E, Sections 3, 4, 9, 10, 15, and 16 | Cox and Rogge 2009 |
| 2009-868.ASM | Overfield Rehab #2 | T5S R7E, Section 33 | Trakes and Goldstein 2009b |
| 2010-542.ASM | Cornerstone Crossing LLC | T6S, R6E, Section 28 | Lindly 2008 |
| 2011-57.ASM | AZ5 Biscayne | T6S, R6E, Section 24 | Johnson and Rogge 2010 |
| 2011-203.ASM | Class III Cultural Resources Surveys in Pima and Pinal Counties, Arizona, SCIP 2011 Second Quarter | T5S, R7E, Section 33 | Rago 2011 |

**Table F-1 Previous Project Surveys in the Study Area**

| Project No. | Project Name | Location | Reference |
|---|---|---|---|
| 2011-549.ASM | Promenade at Casa Grande SCIP Permit Survey | T6S, R6E, Sections 23 and 24 | Breternitz and Robinson 2007 |
| 2011-637.ASM | MN391 Storey Road Storage Pit | T6S, R7E, Section 17 | Remington 2011 |

ADOT = Arizona Department of Transportation
ASM = Arizona State Museum
CAP = Central Arizona Project
E = East
EPNG = El Paso Natural Gas
I-10 = Interstate 10
kV = kilovolt
LLC = limited liability corporation
R = Range
Rd = Road
S = South
SCIP = San Carlos Irrigation Project
SHPO = State Historic Preservation Office
SR = State Route
T = Township

**Table F-2 Previously Recorded Sites in the Study Area**

| Site No. / Name | Description | NRHP Eligibility | Reference(s) |
|---|---|---|---|
| AZ AA:2:136 (ASM) | Historic American artifact scatter | Determined not eligible | Barz and Neeley 1998 |
| AZ AA:2:94 (ASM); A-20624 (BLM) | Prehistoric Hohokam artifact scatter | Unknown | Batcho 1985 |
| AZ AA:2:96 (ASM); A-20624 (BLM) | Prehistoric Hohokam artifact scatter | Unknown | Batcho 1985 |
| AZ AA:2:137 (ASM) | Multi-component: Prehistoric Hohokam artifact scatter and historic O'odham artifact scatter | Not evaluated | Barz and Neeley 1998 |
| AZ AA:2:149 (ASM)/ State Route 287 | Historic American roadway | Determined eligible (D) | Stone 2000 |
| AZ AA:2:184 (ASM) | Prehistoric Hohokam artifact scatter | Determined not eligible | Coriell and Courtright 2000 |
| AZ AA:2:187 (ASM) | Prehistoric Hohokam artifact scatter | Determined not eligible | Coriell and Courtright 2000 |
| AZ AA:2:171 (ASM) | Prehistoric Hohokam artifact scatter | Recommended not eligible | Stubing 1999 |
| AZ AA:2:185 (ASM) | Prehistoric Hohokam artifact scatter | Determined not eligible | Coriell and Courtright 2000 |
| AZ AA:2:186 (ASM) | Prehistoric Hohokam artifact scatter | Determined not eligible | Coriell and Courtright 2000 |
| AZ AA:2:223 (ASM)/ Tunon Homestead | Historic American homestead; data recovered | Determined eligible (D) | Kennedy 2003; Wright 2006 |
| AZ AA:12:875 (ASM); AZ AA:7:505 (ASM)/ El Paso Natural Gas Pipeline No. 1007 | Historic American natural gas line | Determined eligible (C and D) | Hesse 2003 |

ASM = Arizona State Museum
BLM = Bureau of Land Management
SR = State Route

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