

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter discusses the affected environment in the study area for a new facility and describes the effects of Alternatives 1, 2, and 3, and the No Build Alternative. Mitigation measures are outlined as well, which include required standard mitigation.

Based on field reconnaissance, aerial imagery, and state and local databases, there are no known sole-source aquifers, wilderness areas, designated critical habitats, or wild and scenic rivers within the study area. Therefore, no effects on these resources would occur from Alternative 1, 2, or 3. This negative declaration of impacts on the above-referenced resources is not restated in this document.

The environmental considerations analyzed below include land ownership, utilities, socio-economic conditions, environmental justice, Section 4(f) properties, visual resources, noise, cultural resources, air quality, prime and unique farmlands, water resources, biological resources, and hazardous materials.

In this chapter, the alternatives analysis is discussed first according to the resources described above. Within each resource, Alternatives 1 and 2 are discussed together because of their similarity, and Alternative 3 and the No Build Alternative are discussed separately. The existing conditions for each resource are described first, followed by the environmental consequences from each of the three alternatives, including the No Build Alternative. Given the length of the proposed alignment, each alternative was subdivided into three parts in order to provide better evaluation and comparison of each alternative. The western portion goes from Sarival Avenue to Dysart Road, the central portion runs from Dysart Road to 91st Avenue, and the eastern portion is located east of 91st Avenue to Grand Avenue.

Construction of a new roadway facility would require compliance with federal, state, and local laws as appropriate (e.g., Clean Air Act, Clean Water Act, Endangered Species Act, etc.). Therefore, compliance with applicable laws would not be stated as mitigation measures. Mitigation measures are listed for each resource within this chapter as applicable to reduce, eliminate, or compensate for the potential occurrence of adverse environmental effects to ensure compliance with applicable laws. MCDOT would design and construct the new facility (to ADOT standards) and would, therefore, have responsibility for implementing all mitigation measures listed herein.

4.1 LAND OWNERSHIP AND JURISDICTION

The study area examined for land use is located on both public and private lands within the jurisdictions of the cities of Glendale, Peoria, and El Mirage and also through parts of unincorporated Maricopa County (see Figure 4-1). Existing and planned land use data were

collected through analysis of aerial photography, field verification, and review of existing studies and plans. Throughout this section, the area within 1.0 mile of Alternatives 1, 2, and 3 is referred to as the study area. Refer to Figure 4-3A for existing land uses and Figure 4-3B for planned land uses throughout the study area.

4.1.1 Affected Environment

Existing Land Uses – West

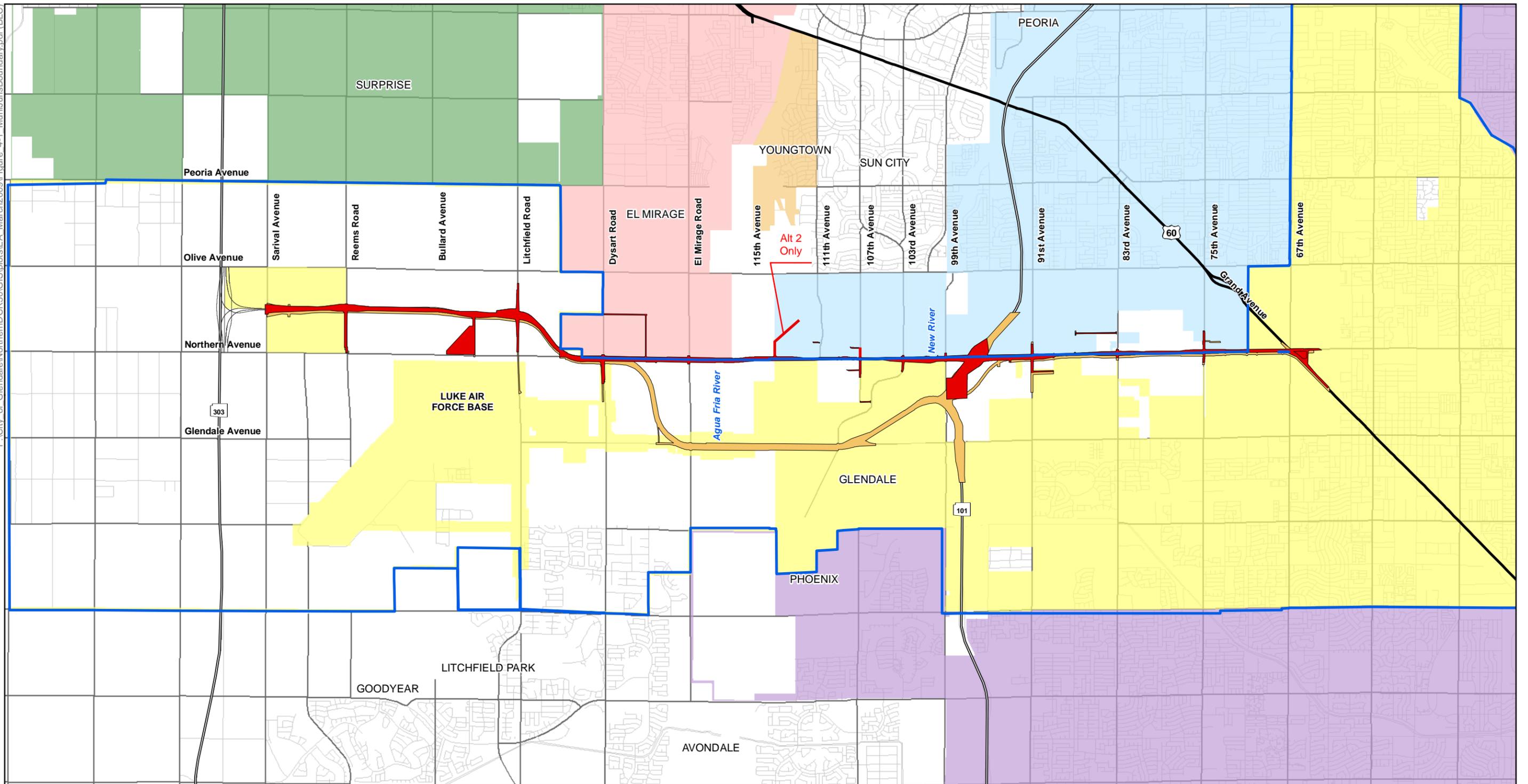
Along the western portion of the study area, irrigated farms are the primary land users; however, there is rural residential development (e.g., 1-acre or larger lots). Upon field verification, residential structures found within the proposed right-of-way included one residential structure and one abandoned mobile home near 143rd Avenue. There also are three residences and one mobile home between Litchfield and Dysart roads. Along North 143rd Avenue from Olive Avenue to Northern Avenue, there are existing structures designated for commercial development. Along this portion, there are two elementary schools. Rancho Gabriela Elementary School is located north of Peoria Avenue, east of Reems Road (see Figure 4-2). Luke Elementary School is located along Dysart Road, just north of Glendale Avenue.

As shown in Figure 4-3A, the Falcon Dunes Golf Course is located between approximately 151st Avenue and Reems Road adjacent to the proposed parkway. It is owned by Luke AFB and is not open to the public. The Wildlife World Zoo is located between SR 303L and Sarival Avenue along Northern Avenue. The most notable landmark in this portion is Luke AFB, which is located between Reems and Litchfield roads on the south side of Northern Avenue.

The largest contiguous area of agricultural land is located west of Dysart Road. Livestock operations such as feedlots and boarding stables also were identified at various locations, along with irrigation canals and drainage ditches.

Existing Land Uses – Central

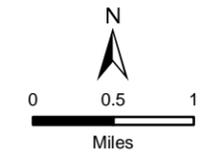
In the central portion of Alternatives 1 and 2, along Northern Avenue, just east of El Mirage Road, between 112th and 103rd avenues, there is dense residential development. Residential structures within the proposed right-of-way for access roads to 107th Avenue include two condominium units in the Country Meadows Condominiums subdivision and one residential property in the Country Meadows Estate subdivision. Just east of 103rd Avenue along Northern Avenue, there are dispersed structures of mixed use, including low-density residences with adjacent agricultural structures, modern subdivisions, and mobile homes. Residential structures located on or immediately adjacent to Northern Avenue include two residences near 95th Avenue.



Legend		Municipal Jurisdictions		General Features	
	Alternatives 1 and 2		Glendale		Phoenix
	Alternative 3		El Mirage		Surprise
			Peoria		Youngtown
			Glendale Municipal Planning Area		Interstate/U.S. Highway
					State Highway
					Arterial Road
					Local Road

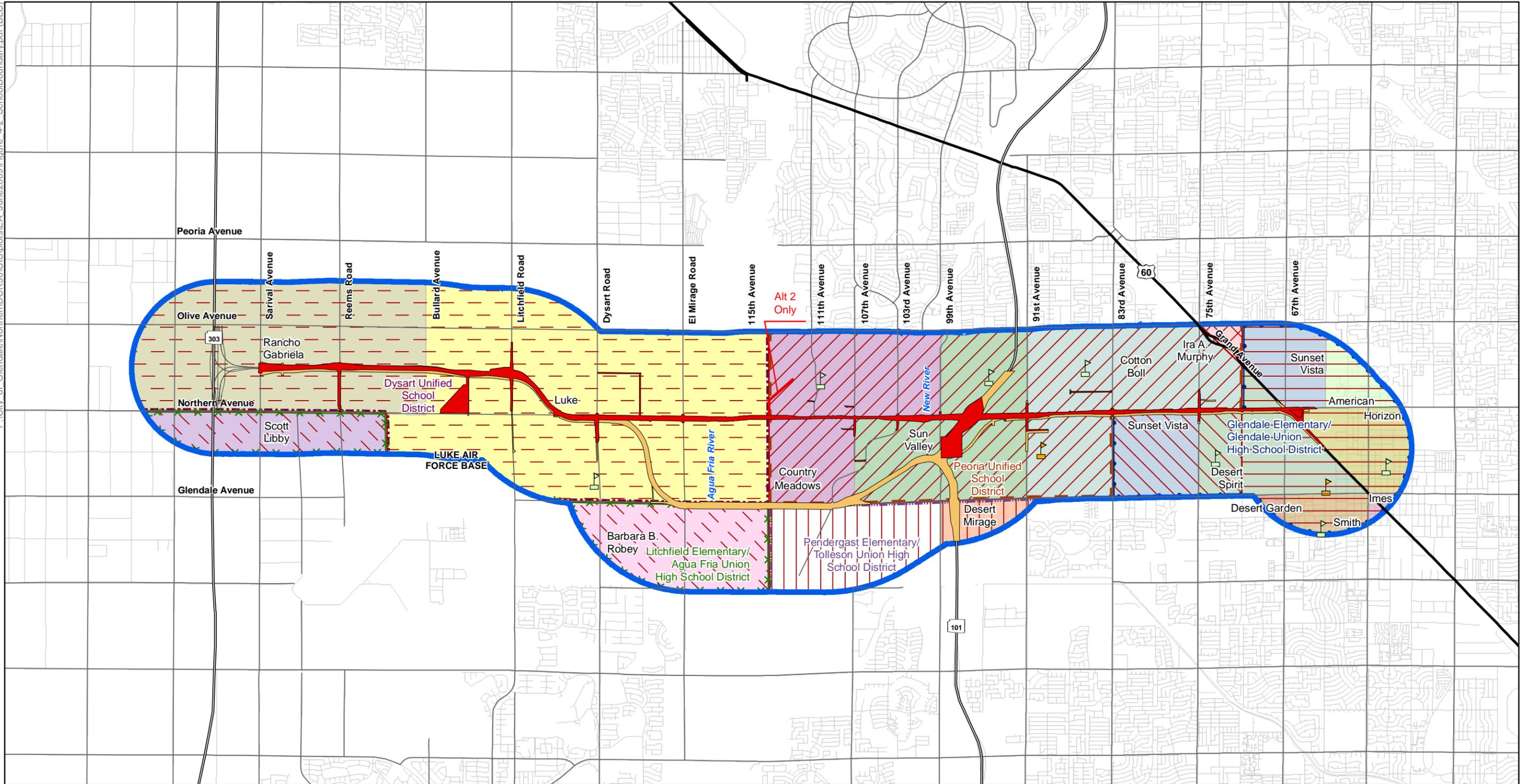
**Municipal Jurisdictional Boundaries
Northern Parkway**

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C



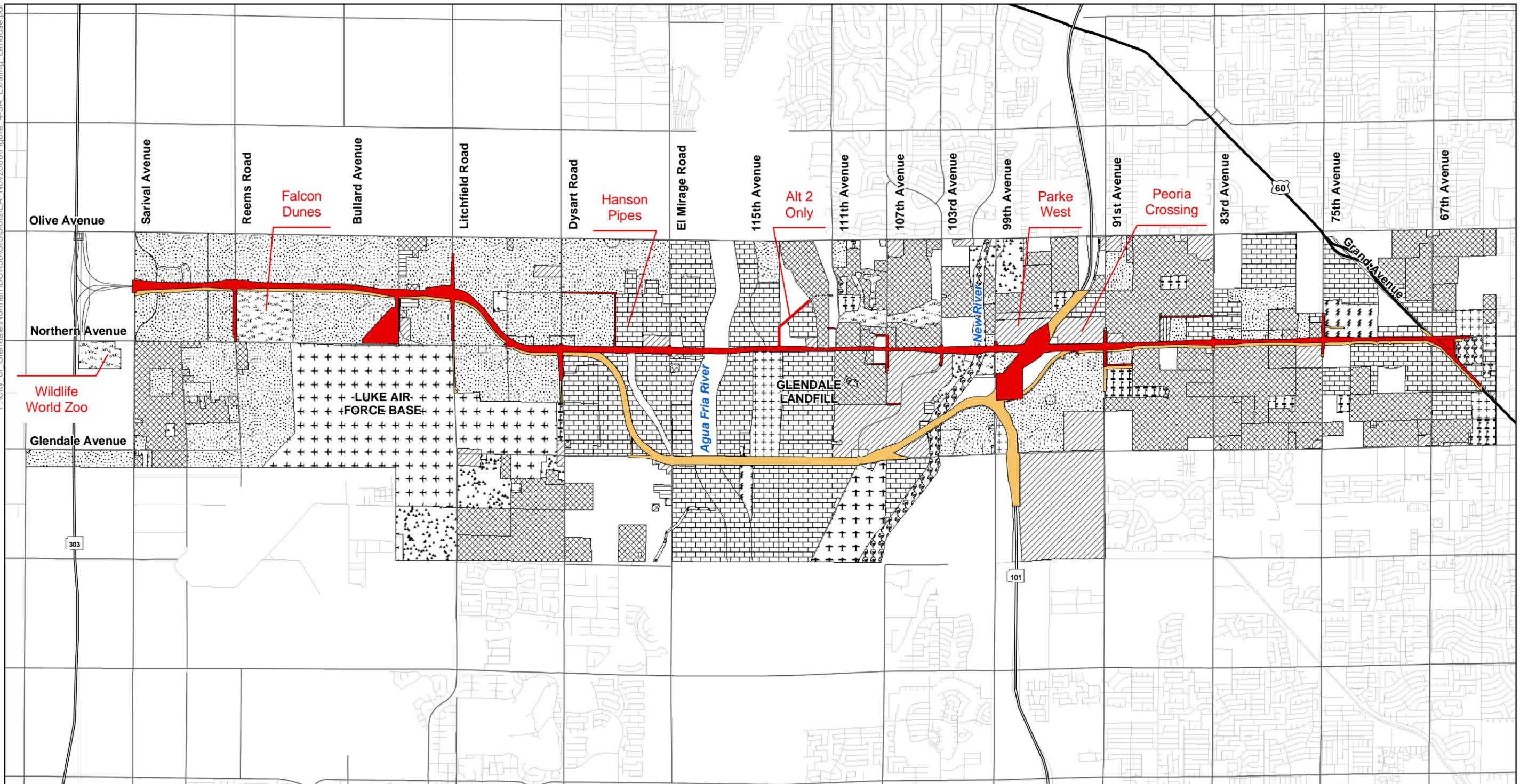
Source:
 Base: ALRIS 1997-2008, MAG 2000

Figure 4-1



Legend		School Districts		High School Areas		Elementary School Area		General Features		School Boundaries Northern Parkway	
	Alternatives 1 and 2		Dysart Unified School District		Copper Canyon		American		Interstate/U.S. Highway	Federal Project No. STP-MMA-0(034)B TRACS No. 0000 MA MMA SS593 01C	
	Alternative 3		Glendale Elementary/ Glendale Union High School District		Glendale		Desert Spirit		State Highway		
	Study Area		Litchfield Elementary/ Agua Fria Union High School District		Independence		Horizon		Arterial Road	 Figure 4-2	
	Elementary School		Peoria Unified School District		Millennium		Imes		Local Road		
	High School						Scott Libby				
							Smith				
							Sun Valley				
							Sunset Vista				
							Luke				
							Rancho Gabriela				
							Desert Mirage				

Source:
Base: ALRIS 1997-2008, MAG 2000

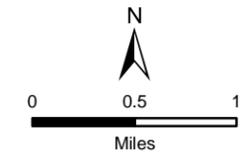


Legend

- | | | | | |
|----------------------|-----------------------------|--------------------|------------------------|-------------------------|
| Alternatives 1 and 2 | Existing Land Use | Air Facilities | Communication Facility | General Features |
| Alternative 3 | Residential | Military | Recreation | Interstate/U.S. Highway |
| | Commercial | Agriculture | Parks/Preservation | State Highway |
| | Mixed Use | Vacant/Undeveloped | | Arterial Road |
| | Land Fill/Industrial | Utilities | | Local Road |
| | Public/Quasi-Public | Canal | | |
| | School/Educational Facility | | | |

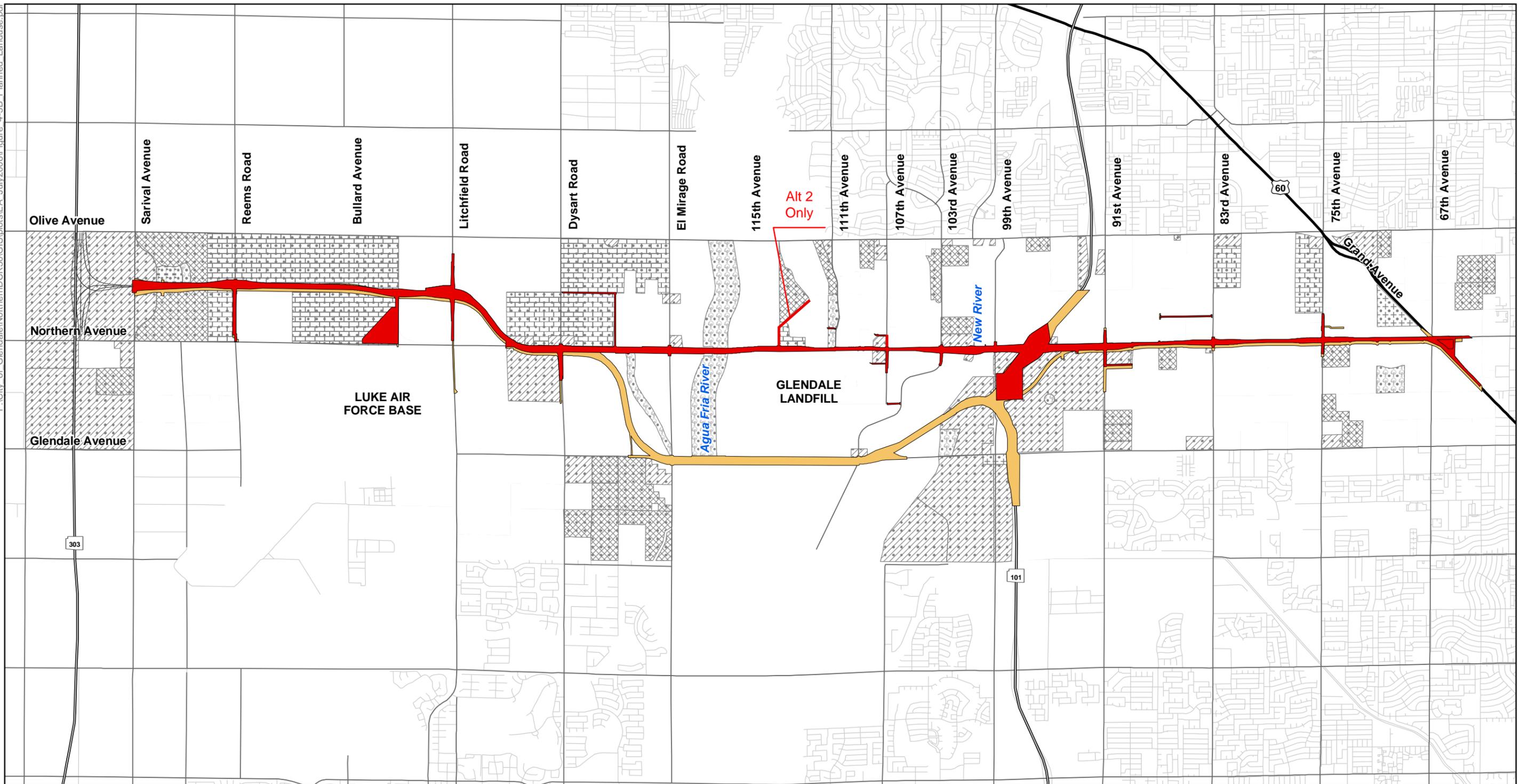
**Existing Land Use
Northern Parkway**

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C



Source:
 Base: ALRIS 1997-2007

Figure 4-3A



Legend

- Alternatives 1 and 2
- Alternative 3

Planned Land Use

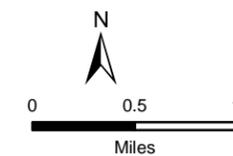
- Planned Residential
- Planned Commercial
- Planned Mixed Use
- Planned Industrial
- Planned Public
- Planned Park
- Planned School

General Features

- Interstate/U.S. Highway
- State Highway
- Arterial Road
- Local Road

**Planned Land Use
Northern Parkway**

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C



Source:
 Base: ALRIS 1997-2007

Figure 4-3B

Peoria Crossings, a commercial/retail center, is located immediately north of Northern Avenue and between 91st Avenue and SR 101L. Currently nearing completion is Park West Shopping Center, located north of Northern Avenue, between 99th Avenue and SR 101L. In addition, there are storage businesses located on the northwest corner of El Mirage Road and Northern Avenue and Hansen Pipe manufacturing facility west of the storage business. Glen Harbor Business Park, located south of Northern Avenue between 107th and 103rd avenues, is a manufacturing distribution office complex that is in the process of development. A Coca-Cola plant is also located south of Northern Avenue between 107th and 103rd avenues.

Industrial development also is interspersed throughout the central portion of the study area. Typical industrial facilities consist of product manufacturing operations (e.g., lumber and metal), salvage yards, warehouses, and sand-and-gravel operations that are concentrated along the Agua Fria River. Immediately south of Northern Avenue, between 111th and 115th avenues, is the City of Glendale Landfill.

The privately owned Country Meadows Golf Course is located approximately 0.25 mile north of Northern Avenue between 103rd and 111th avenues. A driving range is located south of Northern Avenue, and west of 99th Avenue. Jobing.com Arena (Coyotes Hockey) and University of Phoenix Stadium (Arizona Cardinals) are located approximately 1 mile south of Northern Avenue between Loop 101 and 91st Avenue. Educational facilities include two elementary schools (refer to Figure 4-2). Sun Valley Elementary School is located approximately 0.5 mile north of Northern Avenue between SR 101L and 95th Avenue. The Country Meadows Elementary School is located approximately 0.5 mile north of Northern Avenue at the intersection of 111th Avenue and Butler Drive.

Along the central portion of Alternative 3, there is a medium-density residential development north of Glendale Avenue and east of Dysart Road. (For this draft EA, medium density is defined as 2.1 to 15 dwelling units per acre.) On the southeast corner of the intersection of Glendale Avenue and El Mirage Road is an existing retail commercial center. On the southeast corner of the intersection of 107th and Glendale avenues, there is an existing retail commercial center. Just south of Glendale Avenue between 115th and 111th avenues, the area has an existing industrial designation. Aerial imagery, however, does not show any facilities constructed in that area. Just south of Glendale Avenue between 107th and 99th avenues, there are cultivated agricultural lands, and just south of Glendale Avenue between 111th and 107th avenues is the Glendale Municipal Airport. The northernmost area of the airport is designated for industrial use and forms part of any ancillary facilities associated with the airport.

Existing Land Uses – East

Along the eastern portion of the study area, there are approximately 15 residences from 87th Avenue to 67th Avenue. Along the northeast side of US 60, there is one residence and several mobile homes. Concentrated on SR 101L, typical commercial facilities consist of gasoline stations, restaurants, and other similar service-oriented establishments. Commercial structures include a Chevron gasoline station just east of 91st Avenue and south of Northern Avenue, a commercial building at the southwest corner of 68th and Northern avenues, and the Palm Harbor Modular Homes sales office in the southeast corner of Northern Avenue and US 60. Along US 60, there also is an automobile body shop, a pet hospital, motels, and the Oakwood Homes office.

A power plant operated by SRP is located approximately 650 feet north of the alignment, east of 75th Avenue. Agricultural lands primarily are located on Northern Avenue between 83rd and 75th avenues. These lands primarily consist of orchards, with some extending as far north as Butler Drive and a large dairy operation on the south side of Northern Avenue. There are four educational facilities in this portion of the study area. The Copper Canyon Academy, a public charter school, is located approximately 0.25 mile south of the proposed new facility at the southeast corner of the intersection of Northern Avenue and 71st Avenue. Cotton Boll Elementary School is located 0.5 mile north of northern Avenue at 85th Avenue and Butler Drive. Desert Spirit Elementary School is located on Orangewood Avenue, east of 75th Avenue. Raymond S. Kellis High School is located 0.25 mile south of Northern Avenue on 91st Avenue, and Glendale High School is located along Glendale Avenue 0.5 mile east of 67th Avenue. Omega Academy is located on Northern Avenue near 87th Avenue. Several churches are located along Northern Avenue in this portion of the corridor including Assembly of God church located on the north side of Northern Avenue east of 83rd Avenue, and the Church of Christ of North Glendale located on the south side of Northern Avenue east of 83rd Avenue.

Planned Land Uses – West

Along the western portion of the study area, land is zoned largely for residential and industrial development as shown in Figure 4-3B. From the planned SR 303L ramp terminals near Sarival Avenue to 0.5 mile west of Reems Road, the area has been zoned for medium-density residential use. An educational facility has been proposed for the area just north of the proposed alignment, between Sarival Avenue and Reems Road; however, this school was proposed as part of a residential development which is currently not active.

One mile north and south of the proposed alignment (Alternatives 1, 2, and 3), from 0.5 mile west of Reems Road to 143rd Avenue, the land has been zoned for industrial development. An

industrial park is planned for this area. Areas falling just outside Luke AFB have land uses compatible with Luke AFB constraints. Based on high noise contours and set flight paths, future development is restricted in those areas. Commercial facilities and business parks would be prohibited, as would employment centers that are sensitive to noise, although other types of commercial and business park facilities might be allowed. Residential development within these contours also is strongly discouraged.

Planned Land Uses – Central

Along the central portion of Alternatives 1 and 2, between Dysart and El Mirage roads and extending from Olive Avenue to Northern Avenue, land has been zoned for industrial development. The area on the northeast corner of 103rd and Northern avenues, which currently is designated as vacant land, has also been zoned for future medium-density residential use.

Less than 0.5 mile south of 115th and Olive avenues on land that currently is designated as riverbed/wash, the land is zoned for low-density residential use. These parcels of land are adjacent to existing medium-density residential subdivisions. On the southeast corner of 103rd and Olive avenues, adjacent to an existing commercial structure, there is vacant land that would serve to accommodate future high-density residences, defined as 15 or more dwelling units per acre. (“High density” usually refers to apartments and condominiums where dwelling units are vertically stacked to maximize space.) On the southwest corner of the same intersection, designated vacant land immediately south of an existing group home has been zoned for future medium-density residences.

Along the central portion of Alternatives 1 and 2 between 107th Avenue and SR 101L, the undeveloped land is zoned for commercial development. Planned development includes business parks, office buildings, a self-storage facility, and the Park West Shopping Center, which is nearing completion. A neighborhood shopping center is proposed for the northeast corner of 107th Avenue and Northern Avenue, and a retail park is planned for the southwest corner on what currently is vacant land. On the southeast corner of 103rd and Northern avenues, on land that already is zoned for commercial use, offices or business parks are planned. Vacant land north of an existing golf course on the southwest corner of 99th and Northern avenues is expected to accommodate a future business park.

Inside the study corridor, land that is under the jurisdiction of the City of El Mirage is planned to contain a mixture of commercial and industrial development. A commercial node for retail services is planned between Dysart and El Mirage roads on Olive Avenue. Areas previously designated for industrial use at El Mirage Road southbound to Northern Avenue now are zoned for commercial use.

On Northern Avenue, land between Dysart and El Mirage roads, and extending 0.5 mile east of El Mirage Road, existing industrial and commercial development surrounds a large portion of vacant land. That land has been zoned for future mixed use, possibly for both industrial and commercial uses, to achieve compatibility with surrounding structures.

Along the central portion of Alternative 3, undeveloped land adjacent to existing residential development south of Glendale Avenue and 0.5 mile east of Dysart Road would become medium-density residential housing. Undeveloped lands 0.5 mile east and south of the existing residential development are zoned for low-density residential use. On the southeast corner of the intersection of El Mirage Road and Glendale Avenue, low-density housing is planned past the study corridors southbound towards Bethany Home Road.

On the southeast corner of the intersection of Dysart Road and Glendale Avenue, a commercial development with a 0.5-square-mile radius is planned. On the southwest corner of the intersection of El Mirage Road and Glendale Avenue, just southwest of an existing retail center, another commercial development is planned. Between 107th and 99th avenues along Glendale Avenue, south of the riverbed/wash on what are currently agricultural lands, business parks would extend southbound to Bethany Home Road. Agricultural lands south of Glendale Avenue mainly are zoned for a mix of future commercial and industrial uses.

Planned Land Uses – East

Along the eastern portion of the study area, future development is limited to residential and commercial uses. A residential development is planned for the area southeast of 87th and Northern avenues, just north of the Rovey Farms Estates. A commercial facility is planned for the southeast corner of 91st and Northern avenues. On the southwest corner of 91st Avenue and Northern Parkway, the Tohono O’odham Nation is exploring the possibility of constructing a mixed-use development including a casino. A commercial/retail center also is planned for a parcel on the northeast corner of 87th Avenue and Northern Avenue. Just east of US 60 on the south side of Northern Avenue, an automobile parts store would be built. Four planned industrial parks also would be developed south of the alignment on both sides of 71st Avenue.

4.1.2 Environmental Consequences

Analysis of Alternatives 1 and 2

Alternatives 1 and 2 would impact existing land use from right-of-way acquisitions, which would entail taking various structures throughout the corridor. Alternative 1 would require 305 total acres of right-of-way, and Alternative 2 would require approximately 313 total acres of right-of-way. Along the entire route of Alternatives 1 and 2, approximately 28 residential structures and

9 commercial/industrial structures are located all or partially within the proposed right-of-way for the project.

Changes in access have the potential to effect surrounding neighborhoods. Restricted access through Northern Avenue would impose changes to traffic/commuting patterns on both residential communities and commercial properties. These restrictions would affect residents just north of Northern Avenue between 87th and 83rd avenues. Without the ability to make left turns to travel east and west, drivers would have to travel farther. Restricted access also would affect residents living in residential subdivisions in the general area between 115th and 103rd avenues located north and south of Northern Avenue. Because of proposed restrictions on left turns, drivers would need to travel farther, up to 0.5 mile in some cases in Alternative 2, to enter or leave their neighborhoods on the proposed new facility. Alternative 1 provides good access to the residential areas between 115th Avenue and 103rd Avenue.

Analysis of Alternative 3

Alternative 3 would require right-of-way acquisition, much of which are undeveloped lands, totaling approximately 426 total acres. Along the Alternative 3 route, approximately 22 residential structures and 10 commercial/industrial structures are within the proposed right-of-way and would require acquisition and relocation.

The improved access to and visibility of these lands created by a new facility could have the potential of enhanced development potential or desirability for certain uses.

Analysis of the No Build Alternative

Northern and Glendale avenues would continue to be the main arterial roads in this area. Future development of the area is expected to continue with arterial roads to be improved and built to accommodate this development. Continued development of the area is expected to occur if this alternative is selected, but access throughout the area would be inadequate to support future land use projections, resulting in traffic congestion. The No Build Alternative would impact planned land use in the study area due to the lack of improved access provided to future commercial, industrial, and residential areas.

Summary of Findings

The environmental consequences to land use from Alternatives 1, 2, and 3 are based on two types of effects: (1) the acquisition of property needed for the proposed right-of-way, and (2) loss or limitation of access and provision of new accessibility to existing and future development.

Based on existing and planned land-use conditions, Alternative 3 would require more acquisitions because it does not follow property or section lines or an existing alignment. Because the central portion of Alternatives 1 and 2 is highly developed, it is probable that acquisition of property/land would be high in cost, and there would be more impacts from restricted access than under Alternative 3, as shown in Table 4-1.

**Table 4-1
Summary of Impacts on Land Use**

	Alternative 1	Alternative 2	Alternative 3	No Build Alternative
Number of residential properties affected by right-of-way acquisition	28	28	22	0
Number of commercial/industrial properties affected by right-of-way acquisition	9	9	10	0
Estimated total acreage of land use converted	305	313	426	0
Number of Partial Take Parcels	224	230	229	0
Number of Total Take Parcels	26	26	18	

4.1.3 Mitigation

Effects on land use would be minimized under all three build alternatives by implementing the following mitigation measures:

1. The Maricopa County Department of Transportation’s Contractor would ensure that traffic access continues to be provided throughout the construction phase of the new facility. Traffic control would be in accordance with the most current *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the Federal Highway Administration, including any revisions or additions, and/or associated provisions in the project plans, as determined by Arizona Department of Transportation’s Traffic Design Section during design.
2. The Maricopa County Department of Transportation would ensure that there would be access to pedestrian and transit routes at all times for transit-dependent individuals.
3. The Maricopa County Department of Transportation’s Contractor would provide notice to residences and businesses adjacent to the project at least two weeks prior to construction. The notice would provide information about construction activities and when those would occur. Notice distribution would occur via letters, door hangers, etc.
4. The Maricopa County Department of Transportation would coordinate with local jurisdictions (e.g., City of Glendale, City of El Mirage, and City of Peoria) to develop

specific plans that would accommodate emergency service vehicles and respond to public safety concerns during the construction and operations phases.

5. The Maricopa County Department of Transportation would ensure that relocation of residences and businesses would comply with the terms of the Federal Uniform Relocation Assistance Act of 1970, as amended. This would provide land owners the fair market value for all properties to be acquired for a new facility and relocation assistance for eligible residents and business owners.
6. The Maricopa Department of Transportation would coordinate and work with local jurisdictions (the cities of Glendale, El Mirage, and Peoria) regarding comprehensive city plans that would accommodate growth as a result of a new facility, along with future planned projects.

4.2 UTILITIES

4.2.1 Affected Environment

Utility facility maps have been obtained from both municipal and private utility companies identified along the alignment of Northern Avenue to identify potential locations where service might be disrupted. Utility locations were also investigated along Glendale Avenue as well between El Mirage Road and 99th Avenue.

Utility providers have a variety of facilities located throughout the entire corridor (e.g., transmission lines, stormwater catch basins, light poles, etc.). Utility purveyors (service providers) that serve the project corridor include Southwest Natural Gas, El Paso Natural Gas (EPNG), Arizona Public Service (APS), SRP, City of Glendale Water and Sewer, City of Peoria Water and Sewer, Cox Communications, Qwest, and various telecommunication providers.

4.2.2 Environmental Consequences

Regardless of the selected alternative, coordination with all applicable utility purveyors would be required to determine the location of utility structures and assure that construction and operation of the project would not affect utility service adversely and coordinate relocations where necessary.

Analysis of Alternatives 1 and 2

Construction of Alternatives 1 and 2 would require the relocation of several existing utilities along the project corridor. At the west end of the project, several irrigation wells and a domestic water well would require relocation. Alternatives 1 and 2 would encounter major utility conflicts east of 112th Avenue through developed areas including an EPNG pipe monitoring facility at

109th Avenue and a sewer lift station near 111th Avenue. The grade-separated intersections of 103rd, 91st, 83rd, 75th avenues and at US 60 would be the most disruptive to utility facilities. Further coordination with local utility purveyors, however, would be required prior to the final design phase of the project to assure that there would be no conflicts with existing utility structures.

Analysis of Alternative 3

Several utility structures and purveyors serve properties within the proposed alignment right-of-way, including EPNG, Southwest Gas Corporation, APS, and City of Glendale Water and Sewer. Alternative 3 would avoid the sewer lift station near 112th Avenue and the EPNG facility but would impact a groundwater recharge facility. As a result, coordination with the local utility purveyors would be required prior to the final design stage of the project to determine exact effects on utilities and potential temporary disruptions that might occur during construction.

Analysis of the No Build Alternative

Individual roadway improvement projects likely would occur along Northern Avenue, which would result in the necessary coordination with utility purveyors for those individual projects.

Summary of Findings

Effects on utilities would not vary greatly among Alternatives 1, 2, and 3. Alternative 3 would avoid relocation of the EPNG facility and Peoria lift stations which would total nearly \$2 million in cost. Regardless of the selected alternative, coordination with all applicable utility purveyors would be required to determine the location of utility structures and assure that construction and operation of the project would not affect utility service adversely.

4.2.3 Mitigation

Effects on utilities would be minimized under all three build alternatives by implementing the following mitigation measure:

Prior to construction, the Maricopa County Department of Transportation would coordinate relocation of affected utilities with utility purveyors as necessary.

4.3 SOCIOECONOMIC CONDITIONS

Social and economic considerations in the study area is comprised of a corridor 2 miles north and south of the proposed new facility right-of-way, extending from Sarival Avenue in the west to the downtown Glendale area at Glendale, Grand, and 59th avenues. Census tracts within this study area are shown on Figure 4-4. Social and economic conditions include analyses of

population, employment, and services for Alternatives 1, 2, and 3. (Refer to Appendix A for census tracts by areas.)

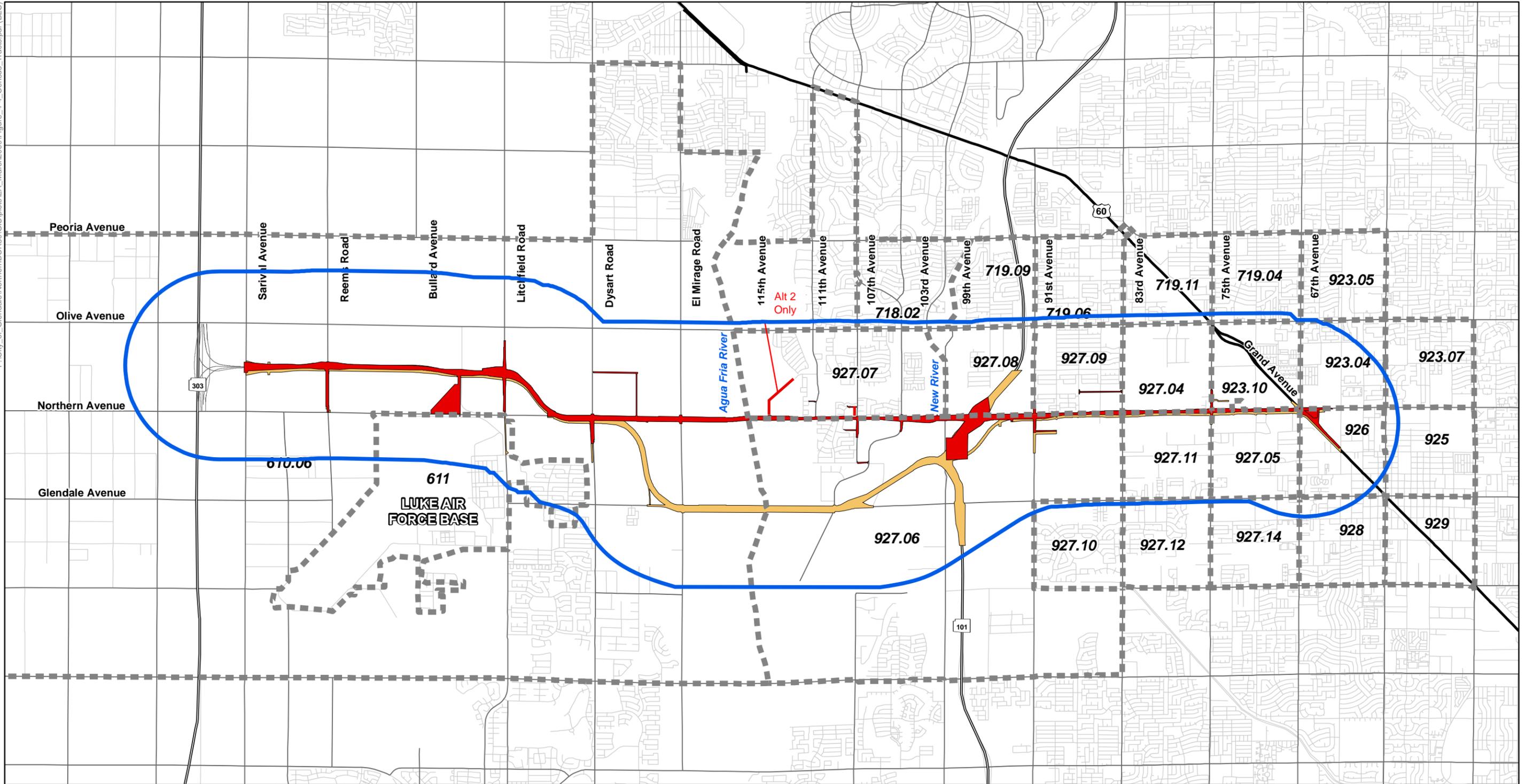
4.3.1 Affected Environment

Population and Demographics

Demographic data obtained from the U.S. Bureau of the Census were used to compare the demographic profile of the study area to that of Maricopa County, Peoria, Glendale, Sun City, El Mirage, Youngtown, and Surprise. Twenty-seven census tracts approximate the study area's boundary and population. The study area has several subareas within it that have roughly the same proportion of population aged 60 and over (15 percent) and gender distribution (50 percent male, 50 percent female) as does Maricopa County. In other subareas, there are retirement communities, some of which are age-restricted, which have high concentrations of population aged 60 or over (88.9 percent in Sun City). Subareas both on and off Luke AFB have concentrations of Luke AFB personnel as residents. Those areas have populations that are younger with a higher proportion of males than the study area in general (0.2 percent aged 60 or over and 56 percent male at Luke AFB). Luke AFB is near some of the retirement communities, so some of the same census tracts have concentrations both of populations aged 60 and over and populations of the younger, predominantly male Luke AFB personnel.

Currently, the study area's highest median household incomes are the single-family residential areas to the north and to the west of downtown Glendale. Some of those neighborhoods, north of Northern Avenue, are in the city of Peoria. Table 4-2 shows the demographic profile of all the jurisdictions, with Maricopa County serving as a basis of comparison to specific census tracts along portions of the study area. The tables in Appendix A show the census tract characterizations for Alternatives 1, 2, and 3.

Along the western portion of the study area, population is sparse and there are only two census tracts. A substantially large percentage of the total population of both tracts is White. With a White population of 72.5 percent, Census Tract 611 has 4.9 percent fewer White residents than does Maricopa County. Within the same census tract, there is a slightly higher proportion of males than females, exceeding the Maricopa County ratio by 4 percent. The percentage of individuals aged 60 years and over is lower in both census tracts than in Maricopa County. The percentage of individuals living below the poverty level in Census Tract 610.06 is similar to the percentages of both the City of Glendale and Maricopa County.



Legend

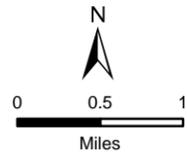
- Alternatives 1 and 2
- Alternative 3
- Census Tract Boundary
- 610.06 Census Tract Number

General Features

- Study Area
- Interstate/U.S. Highway
- State Highway
- Arterial Road
- Local Road

**Census Tracts
Northern Parkway**

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C



Source:
 Census Data - ESRI 2004
 Base Map - ALRIS 1997-2008; MAG 2008

Figure 4-4

**Table 4-2
Jurisdictional Census Tract Characterization**

Demographic Characteristic	Census Tracts						
	City of Peoria	City of Glendale	Sun City	City of El Mirage	Town of Youngtown	City of Surprise	Maricopa County
Total population	108,364	218,812	38,309	7,609	3,010	30,848	3,072,149
Gender:							
Male	48%	50%	41.1%	51.3%	41.2%	49.1%	50%
Female	52%	50%	58.9%	48.7%	58.8%	50.9%	50%
Race and ethnicity:							
White alone	84.9%	75.5%	98.4%	66.3%	88.9%	86%	77.4%
Black or African-American alone	2.8%	4.7%	0.5%	3.3%	1.4%	2.6%	3.7%
American Indian/Alaska Native alone	0.7%	1.5%	0.1%	0.9%	0.5%	0.4%	1.8%
Asian alone	1.9%	2.7%	0.3%	0.4%	0.6%	1.1%	2.2%
Some other race alone ¹	7.2%	12.1%	0.2%	26.3%	7.5%	8%	12%
Two or more races alone	2.5%	3.5%	0.4%	3%	1.1%	2%	2.9%
Hispanic or Latino	15.4%	24.8%	1.1%	66.8%	12.7%	23.3%	24.8%
Aged 60 years and over	18.1%	10.4%	88.9%	9.2%	58%	32.2%	15.1%
Disabled individuals ²	17.5%	17.2%	34.0%	23.8%	39.3%	19.5%	17.1%
Individuals below the poverty level ³	10.8%	16.7%	7%	27.1%	17.4%	12.4%	10.4%
Total of individuals below the poverty level ⁴	5.3%	11.9%	4.6%	15.9%	13.1%	8.7%	11.7%
Median household income	\$52,199	\$45,015	\$32,508	\$33,813	\$23,164	\$44,156	\$45,358

SOURCE: U.S. Census Bureau 2000

NOTES: ¹ Includes Native Hawaiian and other Pacific Islander.

² Among civilian noninstitutionalized persons 16 years of age and over.

³ Among civilian noninstitutionalized persons 16 years of age and over. Percentages may not total 100 due to rounding.

⁴ Includes grand total of individuals with an income in 1999 below poverty level. SF3 P87 was used to determine figures.

Along the central portion of Alternatives 1 and 2, there are four census tracts. In all of them, there are more females than males, and the differences are most pronounced in Census Tracts 717 and 718.02, where females outnumber males by 8 and 6 percent, respectively. In these census tracts there is also a significantly higher percentage of individuals aged 60 years and over. The median household income is low in comparison to that of Maricopa County.

Along the central portion of Alternative 3, there is only one census tract, which is located in the city of Glendale. The median household income in this tract is higher than in Glendale by approximately \$15,000. Given a higher median household income, the percentage of individuals living below the poverty level in this census tract is lower than in Glendale, at 14.6 percent. The total of individuals living below poverty level in this census tract also is lower than in Glendale by 9.5 percent. Race and ethnicity statistics, however, are similar.

Along the eastern portion of the study area, population is dense, given existing development. There are 20 census tracts that fall within the study corridor. The percentage of Whites tends to be predominant in all census tracts. Compared to Maricopa County, there is a higher percentage of Hispanics or Latinos living in 13 census tracts. Census Tract 931.02 has a high percentage of individuals aged 60 years and over, at 45.4 percent. The percentage of individuals living below the poverty level in 13 census tracts is exceptionally high when compared to Maricopa County. Comparisons of census tracts with large minority populations and individuals living below the poverty level are discussed further in Section 4.4.2.

Employment

Information regarding major employers within the study area was collected from the Arizona Department of Commerce. In the City of Glendale, the largest employers within the study area's boundaries consist of both private and public entities such as Luke AFB, Glendale Municipal Airport, Jobing.com Arena, the City of Glendale, Glendale Community College, and Schuck Component Systems. In Peoria, the City of Peoria also is a large employer, along with the Peoria Unified School District. The largest private sector employers within the study area are Peoria Crossing Power Center; Arizona State Plastering; Specialty Roofing, Inc.; Good Shepherd Care Center; and the Arizona Training and Evaluation Center. In the City of El Mirage, employment is typically found in the construction and service sectors. Aside from the Dysart Unified School District, the largest employers are Clayton Homes, Unified Metro Materials, Food City, Sutter Masonry, and Haulmark. In the Town of Youngtown, the largest employer in the study area is the Arizona Baptist Retirement Center, which had more than 200 employees in 2000. There are many workers in the personal services sector overall, especially in retirement care centers.

Services

There are various emergency agencies and facilities that serve the study area, including the police and fire departments of the cities of Glendale, Peoria, and El Mirage. The Maricopa County Sheriff's Department and the Arizona Department of Public Safety also serve the study area.

One medical center is located within approximately 2 miles of Northern Avenue: a branch of Arrowhead Hospital is located northeast of the study area, near the intersection of North 87th Drive and West Monroe Street.

Various departments serving the City of Glendale occupy the Glendale Civic Center, located on 5750 West Glenn Drive, which provide social services to city residents. The Community Center in Peoria provides the city's residents with various social services and is located on 83rd Drive and Jefferson Street, just 2 blocks south of Peoria Avenue. Youngtown Town Hall and El Mirage City Hall also provide social services to the citizens of their town and city, respectively.

The study area includes portions of the Peoria Unified School District No. 11, Glendale Elementary District No. 40, Glendale Union High School District, Dysart Unified District No. 89, Agua Fria Union High School District, and Youngtown Public Charter School. There are numerous educational facilities located throughout the study area. Refer to Section 4.1.1 and Figure 4-2 for information on the location of the schools.

For recreation, there are numerous parks within the study area. In Glendale, there are 11 parks within the study area. Two of them lie within 0.5 mile of Northern Avenue: Lions Park, located at the intersection of 63rd Avenue and Frier Drive, and Sycamore Grove Park, located at the intersection of 86th Lane and Emil Rovey Parkway. In Peoria, there are eight neighborhood parks within the study area. These are further discussed in Section 4.5.2.

4.3.2 Environmental Consequences

Analysis of Alternatives 1 and 2

Along the western portion of the study area, residents living in the four residential structures located all or partially within the proposed right-of-way west of Dysart Road would result in structure relocation or partial loss of property. There also would be no access from Northern Parkway to planned commercial development within the area along the proposed right-of-way except for a planned GSI at Sarival Avenue, Reems Road, Litchfield Road, Dysart Road, and El Mirage Road, and along the frontage roads between Dysart Road and El Mirage Road.

Along the central portion of the study area, four homes and two businesses located all or partially within the proposed right-of-way would result in building relocation or partial loss of property. Restricted access, including right-in/right-out street and driveway connections, plus the closure of two streets would affect residents living between 115th and 103rd avenues, north and south of Northern Avenue, resulting in some out-of-direction travel.

Along the eastern portion of the study area, 20 residential structures and seven businesses located all or partially within the proposed right-of-way would result in structure relocation or partial loss of property. Restricted access, including right-in/right-out driveway and street connections, would affect residents along Northern Avenue between 87th and 75th avenues, resulting in some out-of-direction travel and U-turn movements at GSIs at 91st, 83rd, and 75th avenues.

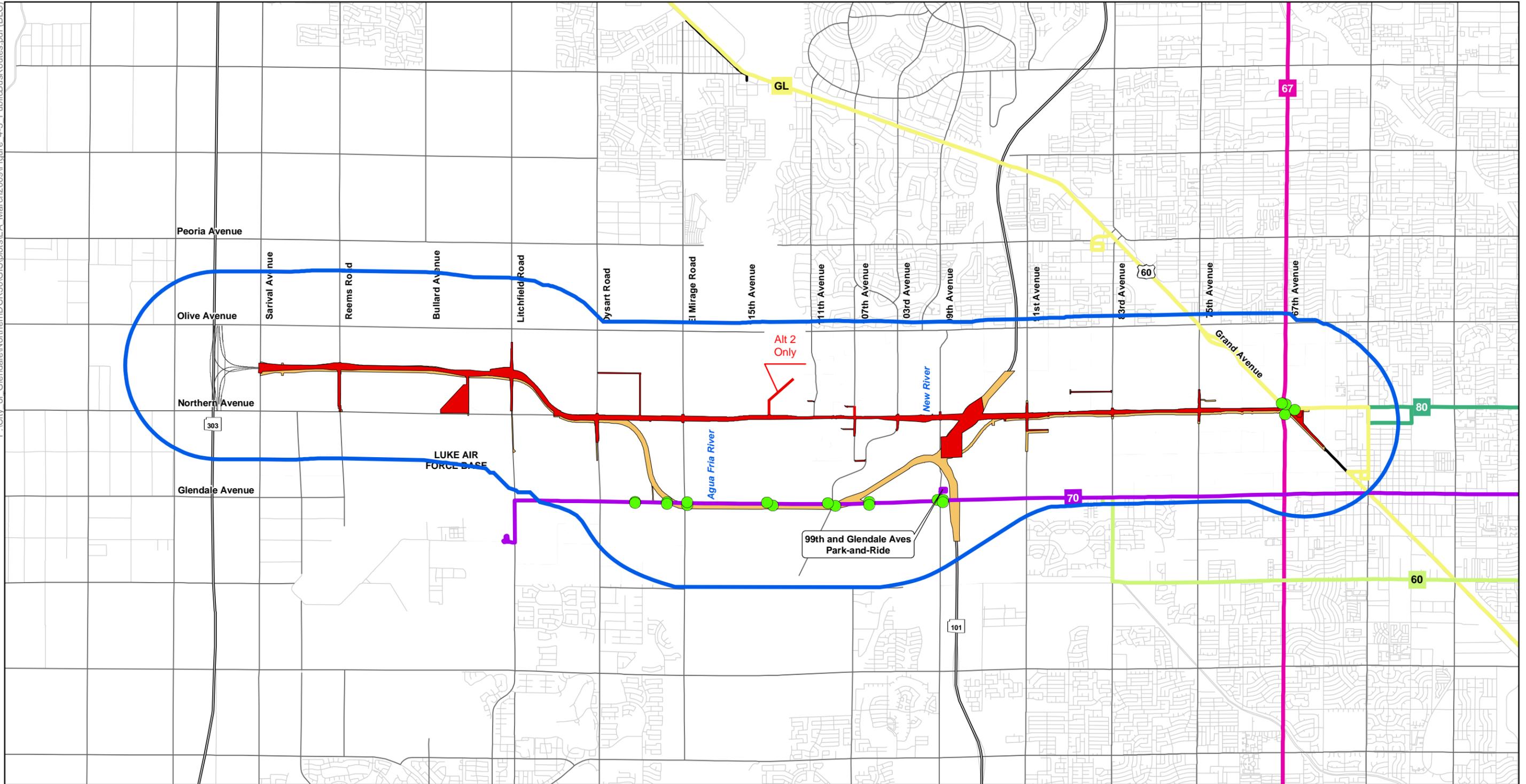
Based on discussions with representatives of Glendale and Peoria fire departments, emergency response would likely be best served by Alternative 2 because the 107th Avenue overpass provides good connection between neighborhoods north and south of the Parkway and because signalized intersections cannot be used for U-turns for firetrucks. GSIs are better for U-turns and signalized intersections are less safe.

The proposed improvements to Northern Parkway would require changes that would affect pedestrian access and movement along the corridor. These changes are explained in detail for each alternative in Section 3.3, Pedestrian Accommodations.

Pedestrian impacts for Alternatives 1 and 2 both include fully controlled access restrictions for safety reasons. Pedestrian crossings of Northern Parkway would be restricted at GSI or other grade separations including 107th Avenue in Alternatives 2 and 3. Pedestrians would be able to cross, however, at specified locations for each alternative. The primary difference between Alternative 1 and 2 regarding pedestrian access is that pedestrians would cross at at-grade signalized intersections at 111th and 107th Avenues for Alternative 1, while a pedestrian overpass would be provided at 107th Avenue with Alternative 2. Frontage roads along the Northern Parkway corridor would be provided with sidewalks for pedestrian access at the outer edge of the frontage roads.

Public bus routes are shown in Figure 4-5 while school bus routes and stops along Northern Avenue are shown in Figure 4-6. School bus routes and bus stops would need to be modified when Northern Parkway is constructed.

Peoria School District has a policy that they bus elementary school children across major arterials including Northern Parkway. Therefore, school children would not need to walk across Northern Parkway.



Legend

- | | | |
|---|---|--|
| Alternatives 1 and 2 | Valley Metro Bus Routes | Valley Metro Bus Stops |
| Alternative 3 | 60 Bethany Home Rd | |
| | 67 67th Ave | |
| | 70 Glendale Ave/24 St | |
| | 80 Northern Ave | |
| | GL Grand Ave Limited | |

General Features

- | |
|--|
| Study Area |
| Interstate/U.S. Highway |
| State Highway |
| Arterial Road |
| Local Road |

**Public Bus Routes
Northern Parkway**

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C

Source:
 Base: ALRIS 1997-2008, MAG 2000
 Bus Routes: Valley Metro 2008
 Bus Stops: City of Glendale 2009

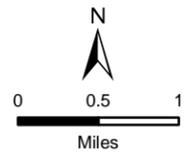
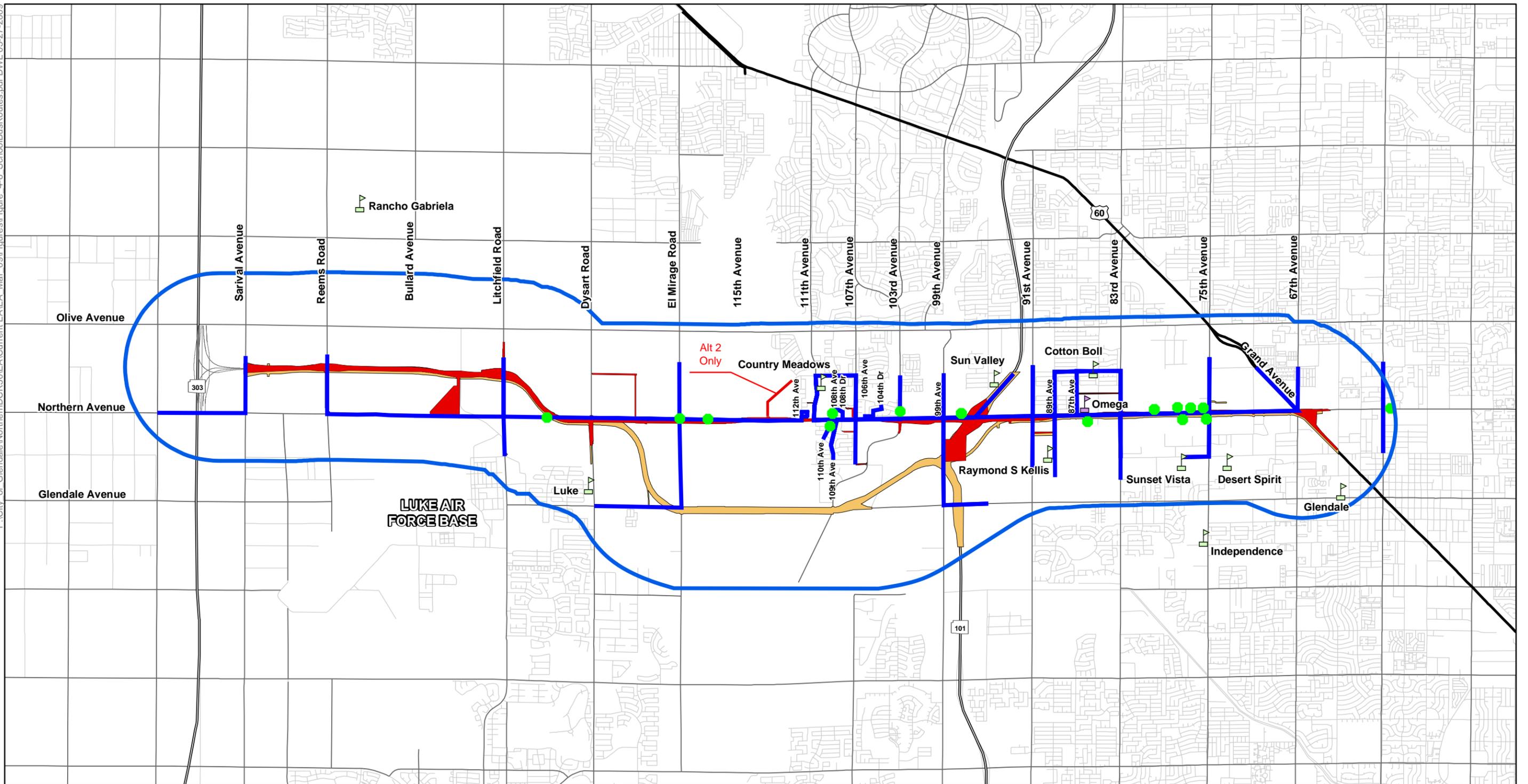


Figure 4-5



Legend		School Bus Routes	
	Alternatives 1 and 2		Northern Parkway
	Alternative 3		
	Route Lines		
	Bus Stops on Northern Parkway		
	Public School		
	Charter School		

Federal Project No. STP-MMA-0(034)B
TRACS No. 0000 MA MMA SS593 01C

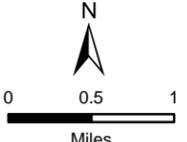


Figure 4-6

Analysis of Alternative 3

Effects on socioeconomic conditions would be the same as those described for the western and eastern portions of Alternatives 1 and 2, but would differ for the central portion with Alternative 3.

Along the central portion of the study area, there are no residential structures and three commercial/industrial structures all or partially located within the proposed right-of-way.

Restricted access would have less impact on the local population along the central portion than with Alternative 1 or 2. Pedestrian access for Alternative 3 is the same as Alternative 1 from Sarival Avenue to Dysart Road and east of 91st Avenue. Northern Parkway from Dysart Road to 91st Avenue is access controlled. As such, no pedestrians would be allowed within the fenced right-of-way. Pedestrians could cross the highway at grade-separated intersections at Dysart Road, El Mirage Road, Glen Harbor Boulevard and 91st Avenue. Additional grade separations at 115th Avenue/Glendale Land Fill Entrance, 99th Avenue, future street east of Loop 101, and 95th Avenue would allow pedestrian crossings of Northern Parkway. Between El Mirage Road and Glen Harbor Boulevard, frontage roads would be provided with sidewalks for pedestrians on the outer edge of the frontage roads.

Analysis of the No Build Alternative

Under the No Build Alternative, there would be no relocation of residents or businesses. However, future development is certain to occur, and access throughout the area might be inadequate to support growth within the area, thus increasing traffic congestion.

Summary of Findings

Because Northern Avenue is well developed, Alternatives 1 and 2 would affect local homeowners and businesses more than Alternative 3. Some residences and commercial businesses would require relocation and acquisition of some total properties and partial property takes would also be required. Restricted access could result in a perceived loss of property value, as well as affect local businesses that could potentially result in a decline in customers. There would be less impacts under Alternative 3, as there is generally less development, especially in the central portion of the alternative. With all three build alternatives, school and public transit bus stops would be modified, but overall service would not be expected to be affected. Under the No Build Alternative, local residences and businesses could still experience impacts, as there would be no improved access that would accommodate future growth within the area.

4.3.3 Mitigation

Effects on socioeconomic conditions would be minimized under all three build alternatives by implementing the following mitigation measure:

- The Maricopa Department of Transportation would coordinate and work with local jurisdictions (the cities of Glendale, El Mirage, and Peoria) regarding comprehensive city plans that would accommodate growth as a result of a new facility, along with future planned projects.
- The Maricopa County Department of Transportation would ensure that local agencies and jurisdictions (e.g., City of Glendale, City of El Mirage, and City of Peoria) would notify the public of the project's status through meetings and newsletters.
- The Maricopa County Department of Transportation's Contractor would ensure that traffic access continues to be provided throughout the construction phase of the new facility. Traffic control would be in accordance with the most current *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the Federal Highway Administration, including any revisions or additions, and/or associated provisions in the project plans, as determined by Arizona Department of Transportation's Traffic Design Section during design.
- The Maricopa County Department of Transportation's Contractor would provide notice to residences and businesses adjacent to the project at least two weeks prior to construction. The notice would provide information about construction activities and when those would occur. Notice distribution would occur via letters, door hangers, etc.

4.4 ENVIRONMENTAL JUSTICE AND TITLE VI OF THE CIVIL RIGHTS ACT

Environmental Justice and 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, or disability. Executive Order 12898 regarding environmental justice directs that programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations. According to these regulations:

Minority populations are persons of Hispanic or Latino origin of any race; Blacks; American Indian/Alaska Natives; and Asians or Pacific Islanders. Low-income populations are persons living below the poverty level. The U.S. Census Bureau

uses a set of income thresholds that vary by family size and composition to determine who would be considered living below the poverty level.

To evaluate whether there are concentrations of the populations mentioned above within the study area, the proportions of minority and poverty populations in the census tracts that include the study area were compared with the proportions in the larger population (e.g., Maricopa County). A concentration of low-income population occurs if the percentage of the population fitting the description exceeds the Maricopa County ratio. Data for municipalities in the vicinity of Alternatives 1, 2, and 3 also are included to provide additional context.

To evaluate the presence of minority populations, data identifying racial and Hispanic minorities were aggregated for the study area. Within the census data, ethnicity is considered separately from race (see Appendix A for census tracts by area).

4.4.1 Affected Environment

The affected environment examined for environmental justice issues is shown in Table 4-2 and in Appendix A.

4.4.2 Environmental Consequences

Analysis of Alternatives 1 and 2

Along the western portion of the study area, one out of two census tracts has a Hispanic/Latino population that is 0.8 percent higher than that of Maricopa County. The poverty level in both of these tracts is lower than the county's. Four census tracts have a higher percentage of individuals with disabilities than Maricopa County's 17.1 percent. Along this portion, there would be no adverse effects on the environmental justice population.

Along the central portion of the study area, none of the five census tracts exceed the Maricopa County ratio for minority population. Census Tract 927.07 has a higher percentage of individuals living beneath the poverty level than in Maricopa County. This tract is located between the Agua Fria River and 99th Avenue, just north of Northern Avenue. Four census tracts in the central portion have a higher percentage of individuals with disabilities than the county. Temporary closures related to construction could affect pedestrian access of the environmental justice population negatively in this area. Detours potentially increasing traffic through this area could affect this population as well. Upon project completion, however, residents would benefit from improved access, especially as further residential and commercial development takes place, thus increasing overall population growth.

Along the eastern portion of the study area, 13 out of 18 census tracts have a higher percentage of minorities than in Maricopa County. The areas are contiguous and are clustered around downtown Glendale. The 13 census tracts with a high concentration of minority population also have a high concentration of persons living in poverty. There are a total of 13 census tracts with a higher percentage of Hispanics/Latinos. There are 12 census tracts with a higher percentage of individuals with disabilities than Maricopa County. Census Tract 927.04, located just north of Northern Avenue between 83rd and 75th avenues, has an exceptionally high percentage of individuals with disabilities, at 57.1 percent. Temporary closures related to construction could affect pedestrian access of the environmental justice population negatively in this area. Detours potentially increasing traffic through this area could affect this population as well.

There is potential for impacts as 7 businesses would be displaced and 20 residences would be relocated in this portion of the study area. Relocation of residents would normally be successful; however, businesses sometimes experience difficulties when relocated. Upon project completion, however, remaining residents and businesses would benefit from improved access, especially as further residential and commercial development takes place, thus increasing overall population growth.

Alternatives 1 and 2 would improve access to major employment centers within the Northern Parkway corridor including Luke AFB, Glen Harbor business park, and employment locations along Grand Avenue. Northern Parkway could be used as an express bus route, however, due to the high traffic volumes, median barriers, and restricted access. Northern Parkway would also form a barrier for pedestrian and bicycle traffic.

Analysis of Alternative 3

For Alternative 3, effects on environmental justice would be the same as those described for the western and eastern portions of Alternatives 1 and 2, except for the central portion.

Along the central portion of Alternative 3, there is only one census tract due to a sparse total population. This tract has a Hispanic/Latino population that is 0.4 percent larger than that of Maricopa County. The total minority population exceeds that of the county by 1.3 percent. The total number of individuals living below the poverty level, however, is lower by 9.3 percent. Census tracts along this portion have a lower percentage of individuals with disabilities than Maricopa County. Along this portion, there would be no adverse effects on potential environmental justice populations as there are no residents that reside near the proposed right-of-way.

Analysis of the No Build Alternative

Under the No Build Alternative, there would be no construction-related disruptions of the population. However, future development is certain to occur, and access throughout the area might be inadequate to support growth within the area, thus increasing traffic congestion.

Summary of Findings

Project construction resulting in minor and temporary delays of local traffic would affect neighborhood continuity/community cohesion mostly along the central portion of Alternative 1 or 2, as there are more residences there than in the central portion of Alternative 3. After construction, pedestrian crossings would be changed; however, Alternative 1 and Alternative 2 to a lesser extent would still provide for pedestrian crossings that would generally accommodate existing pedestrian traffic patterns. Schools and parks would continue to be a catalyst for community cohesion regardless of which side of the Parkway the feature is located.

Along the central portion of Alternative 3, there would be a lesser impact on environmental justice populations than with Alternative 1 or 2. Residents along Northern Avenue, however, would benefit from the reduced traffic congestion and improved access that would result from Alternative 3 implementation, especially since it could mitigate the traffic congestion caused by further residential and commercial development and acquisitions, which likely would increase overall population growth and local traffic. Public involvement efforts outlined in Chapter 6 would include reaching out and receiving input from environmental justice populations residing in the study area to ensure public awareness and participation in the project.

4.4.3 Mitigation

Effects on environmental justice would be minimized under all three build alternatives by implementing the following mitigation measures:

- The Maricopa County Department of Transportation's Contractor would ensure that traffic access continues to be provided throughout the construction phase of the new facility. Traffic control would be in accordance with the most current *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the Federal Highway Administration, including any revisions or additions, and/or associated provisions in the project plans, as determined by Arizona Department of Transportation's Traffic Design Section during design.
- The Maricopa County Department of Transportation's Contractor would provide notice to residences and businesses adjacent to the project at least two weeks prior to

construction. The notice would provide information about construction activities and when those would occur. Notice distribution would occur via letters, door hangers, etc.

- The Maricopa County Department of Transportation would ensure that local agencies and jurisdictions (e.g., City of Glendale, City of El Mirage, and City of Peoria) would notify the public of the project's status through meetings and newsletters.¹
- The Maricopa County Department of Transportation would ensure that there would be access to pedestrian and transit routes at all times for transit-dependent individuals.
- The Maricopa County Department of Transportation's Contractor would provide elderly and disabled populations with contact information for demand-responsive transit services or other assistance.
- The Maricopa County Department of Transportation would coordinate with local jurisdictions (e.g., City of Glendale, City of El Mirage, and City of Peoria) to develop specific plans that would accommodate emergency service vehicles and respond to public safety concerns during the construction and operations phases.
- The Maricopa County Department of Transportation would ensure that relocation of residents and businesses would comply with the terms of the Federal Uniform Relocation Assistance Act of 1970, as amended. This would provide land owners the fair market value for all properties to be acquired for a new facility.

4.5 SECTION 4(F) RESOURCES

Section 4(f) of the U.S. Department of Transportation Act of 1966 (as amended) [codified at 49 United States Code, Section 303(c)] states that the Department of Transportation may approve of the use of publicly owned public parks, recreation areas, or wildlife and waterfowl refuges, as well as historic sites of national, state, or local significance regardless of whether they are publicly owned or open to the public, only if (1) there is no prudent and feasible alternative to using that land, and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife or waterfowl refuge, or historic site resulting from the use.

¹ Materials would also be produced in Spanish for the Spanish-speaking population along these areas.

A use of a Section 4(f) resource, as defined in Title 23 C.F.R. § 774.17, occurs:

- (i) When land is permanently incorporated into a transportation facility;
- (ii) When there is a temporary occupancy of land that is adverse with respect to the statute's preservation purposes; or
- (iii) When there is a constructive use of a Section 4 (f) property.

A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from a Section 4(f) resource, but there are proximity impacts that “are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired” [23 C.F.R. § 774.15(a)]. A constructive use can occur based on the following examples:

- A proposed project results in a restriction on access that substantially diminishes the utility of a publicly owned park, recreation area, or historic site protected under Section 4(f).
- The proximity of a proposed transportation project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f). Potential adverse effects from the transportation facility could include the obstruction or elimination of the primary views of an architecturally significant historical building; a substantial detraction from the setting of a park or historic site from which it derives its value, in substantial part, from its setting; or projected noise levels from the proposed facility interferes with the use and enjoyment of a noise-sensitive resource.

In addition to the Section 4(f) legislation, Section 6(f) of the Land and Water Conservation Fund Act (LWCFA), administered by the Interagency Committee (IAC) for Outdoor Recreation and the U.S. Department of the Interior's National Park Service (NPS), pertains to transportation projects that may affect or permanently convert outdoor recreational property acquired with LWCFA assistance. The LWCFA established the Land and Water Conservation Fund (LWCF), a fund-matching assistance program providing grants paying half the acquisition and development cost of outdoor recreational sites and facilities. Section 6(f) of the act prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without approval from IAC and NPS. NPS must ensure that replacement land of equal value, location, and usefulness is provided as condition of approval for land conversions (16 U.S.C. §§ 4601-4 through 4601-11).

This section presents the results of an evaluation examining potential use of public recreational land and historic resources. There are no wildlife or waterfowl refuges in the study area.

Additionally, there are no properties that used LWCF grants [Section 6(f) properties] in the Study Area.

Land uses within 0.5 mile of the project area were reviewed to identify potential publicly owned parks, recreation areas, or wildlife and waterfowl refuges. Several recreation areas were identified but were determined to not be publicly owned or not open to public use and therefore are not Section 4(f) resources (Appendix J) One park, one existing recreation facility, and one planned recreational facility were classified as Section 4(f) resources within the project area.

4.5.1 Historic Properties

The one historic property identified as a Section 4(f) resource is the Santa Fe, Prescott & Phoenix Railway [designated AZ N:3:32(ASM)]. The railroad was completed through Glendale in 1895, and provided an important connection for Phoenix and the Salt River Valley to the intercontinental rail system. The railroad has been evaluated as eligible for the National Register of Historic places under Criterion A for its association with the development of transportation in Arizona. The line continues to be operated as the BNSF Railway.

Alternatives 1, 2, and 3 would involve construction of a new elevated ramp (flyover) that would connect Northern Parkway to Grand Avenue (US 60). The flyover would carry Northern Parkway traffic above the overpass that carries 67th Avenue traffic over Northern Avenue, Grand Avenue, and the BNSF Railway (originally the Santa Fe, Prescott & Phoenix Railway)]. Two pier supports for the flyover structure would be built within, or partially within the railroad right-of-way, In addition to the flyover, widening and shifting of Northern Avenue and Grand Avenue adjacent to the flyover would require widening of the Northern Avenue at-grade crossing of the railroad.

Construction of the flyover and widening of the at-grade Northern Avenue crossing would not affect any historic materials, design, or workmanship of the railroad, and the setting and feeling of this segment of the railroad have been substantially modified by urban development and the recent construction of the adjacent 67th Avenue overpass. Consultations pursuant to Section 106 of the National Historic Preservation Act concluded that the flyover and widening of the Northern Avenue crossing of the railroad would not adversely affect any historic characteristics that make the Santa Fe, Prescott & Phoenix Railway eligible for the National Register.

Because there would be no acquisition of the railroad right-of-way for the project and the project would not affect the operation of the railroad, there would be no Section 4(f) direct use or constructive use of the railroad. Because none of the alternatives considered for the proposed

action would result in direct or constructive use of the Santa Fe, Prescott & Phoenix Railway, Section 4(f) would not require measures to minimize harm to resources.

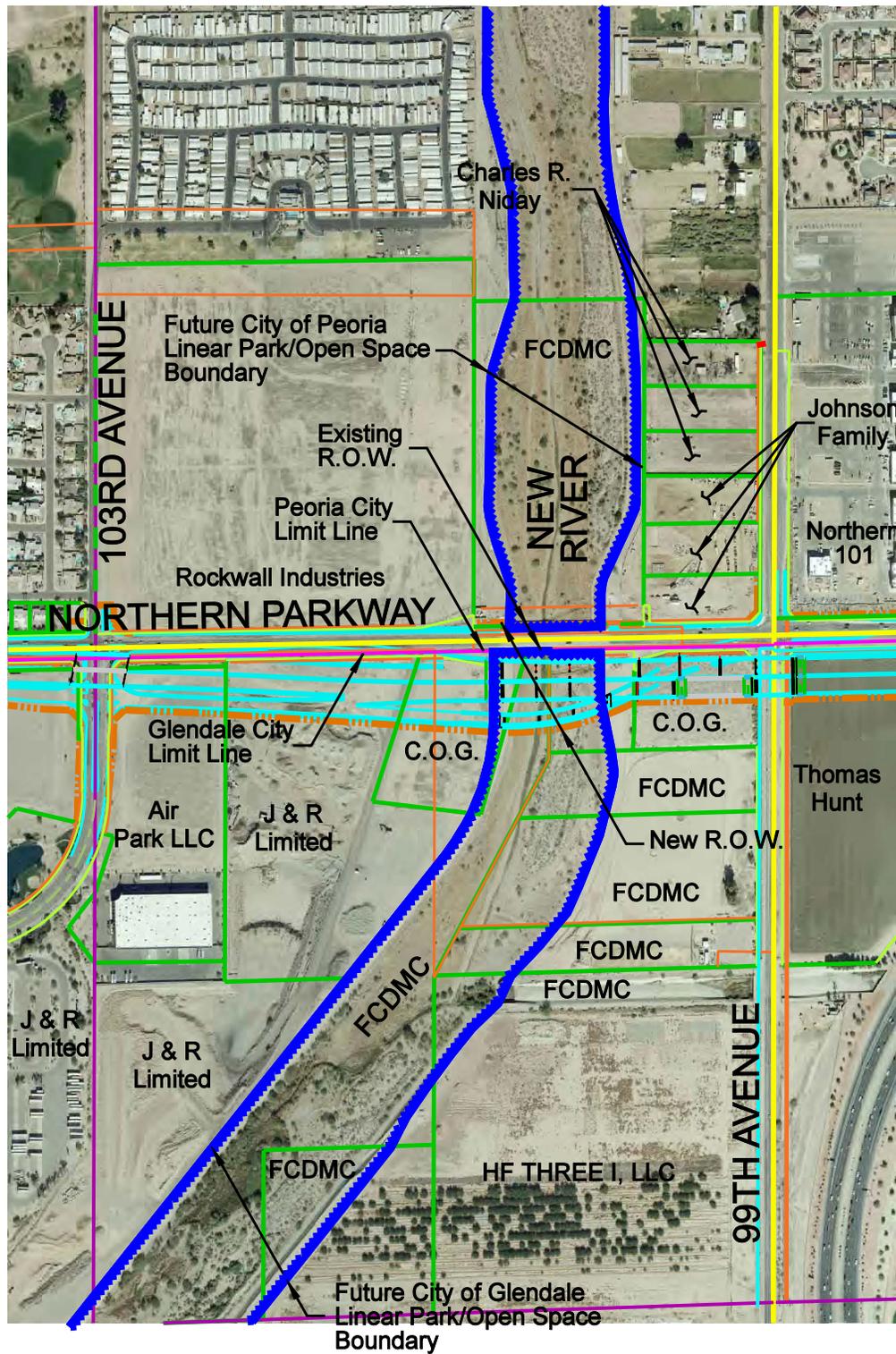
4.5.2 Parks and Recreational Amenities

Publicly owned parks and recreational amenities are eligible for protection under Section 4(f) if their primary purpose is recreation and they are available for walk-on public use. Walk-on use implies that members of the public do not have to make arrangements with park or school officials prior to use of the recreational amenities (after school hours for amenities located on school grounds). Publicly owned land is considered to be a park, recreation area or wildlife and waterfowl refuge when the land has been officially designated as such by a Federal, State or local agency and the officials of these governmental entities, having jurisdiction over the land, determine that one of its major purposes and functions is for park, recreation or as a refuge. Incidental, secondary, occasional or dispersed park, recreational or refuge activities do not constitute a major purpose.

A public park and portions of a public school's outdoor recreation areas meeting these criteria have been identified within 0.5 mile of the study area with Alternatives 1, 2, and 3. Current information indicates that there is a planned trail and linear park that bisects Alternatives 1, 2, and 3.

New River Trail and Linear Park. The New River is a channelized watercourse that crosses Northern Avenue between 103rd and 99th avenues (see Figure 4-7). The channelization work was completed by FCDMC in 1993. The property is generally owned by the FCDMC. The primary funding source was the U.S. Army Corps of Engineers and the primary purpose of the improvements is to convey floodwater. The channelized New River crosses Northern Avenue under an existing bridge.

The City of Glendale Transportation Department has completed a design concept report (DCR) to construct a multiuse path along the New River between Bethany Home Road and Northern Avenue. Northern Avenue is the northern city limit of Glendale. The proposed multi-use path would bisect Alternatives 1, 2, and 3. In addition, the City of Glendale Parks and Recreation Master Plan designates the New River channel as a future "Linear Park/Open Space." Although the multi-use path is in the City of Glendale Transportation Plan and programmed for construction in FY 2010-11, no linear park improvements have yet been funded or programmed in the Glendale Capital Improvement Plan.



Legend

- Linear Park / Open Space Boundary
- Property Lines
- Glendale / Peoria City Limit Line
- New Northern Parkway R.O.W.



New River Linear Park and Open Space

Northern Parkway

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C

Figure 4-7

The proposed New River Trail and Linear Park continues north through the City of Peoria with the southern terminus at Northern Avenue at the City of Glendale boundary. The City of Peoria Parks and Recreation Master Plan designates the New River channel as a future “Linear Park/Open Space.” The multi-use path is in the City of Peoria Transportation Plan, is programmed for construction in FY 2010-11, and the linear park improvements have not been programmed in the Peoria Capital Improvement Plan.

Northern Parkway improvements for Alternatives 1 and 2 would impact the proposed plans for the recreational facility by the Cities of Glendale and Peoria with the construction of two new bridges over the New River. The proposed bridges would cross the river at a perpendicular angle. The structures would require approximately 2.7 acres of the New River Channel to construct roadway improvements including new pavement, sidewalk, curb and gutter, Northern Parkway bridge, and eastbound Northern Avenue bridge.

Northern Parkway improvements for Alternative 3 would impact the proposed plans for the recreational facility only by the City of Glendale with the construction of a new bridge over the New River. The proposed bridge would cross the river in a diagonal direction. The structure would require approximately 6 acres of the New River Channel to construct.

The construction of the proposed bridges will not impede the use of this property for recreation since access through the property would be maintained by a pathway under the bridges. The primary use of this property is for flood control and not recreation. Since recreation is only a secondary use, the New River Channel is not a 4(f) property.

On December 18 and December 30, 2008, initial coordination meetings were conducted with the City of Glendale and the City of Peoria Parks & Recreation staff, respectively. The purpose of the meetings and coordination with local officials was to discuss the proposed improvement alternatives to Northern Parkway and evaluate the potential impacts on publicly-owned sites in current use or planned for recreational purposes that meet Section 4(f) requirements.

Further coordination with the City of Glendale and Peoria would mitigate any potential impacts and access requirements.

Raymond Kellis High School. Raymond Kellis High School is a relatively new high school in the Peoria Unified School District located on 91st Avenue about 1,000 feet south of Northern Avenue (see Figure 4-8). The City of Glendale has recently entered into an Intergovernmental Agreement (IGA) with the school district to allow the City Parks and Recreation Department use of lighted fields, parking lots, and other facilities for recreational purposes. The City will install

lighting in exchange for use of the facilities. Use of these facilities must be scheduled and coordinated with the high school.

Northern Parkway improvements would not require any right-of-way from the school. However, the Northern Parkway project would include construction of Hayward Avenue immediately north of the school from 91st Avenue to 89th Avenue and require 450 square feet of right-of-way from the school to install the city standard sight distance triangle at the intersection of Hayward and 91st Avenue. The right-of-way for the sight triangle is not near the recreational portion of the site and will have no impact to recreational uses. The street construction would provide alternative access to Rovey Farm Estates to help mitigate reduced access along Northern Parkway.

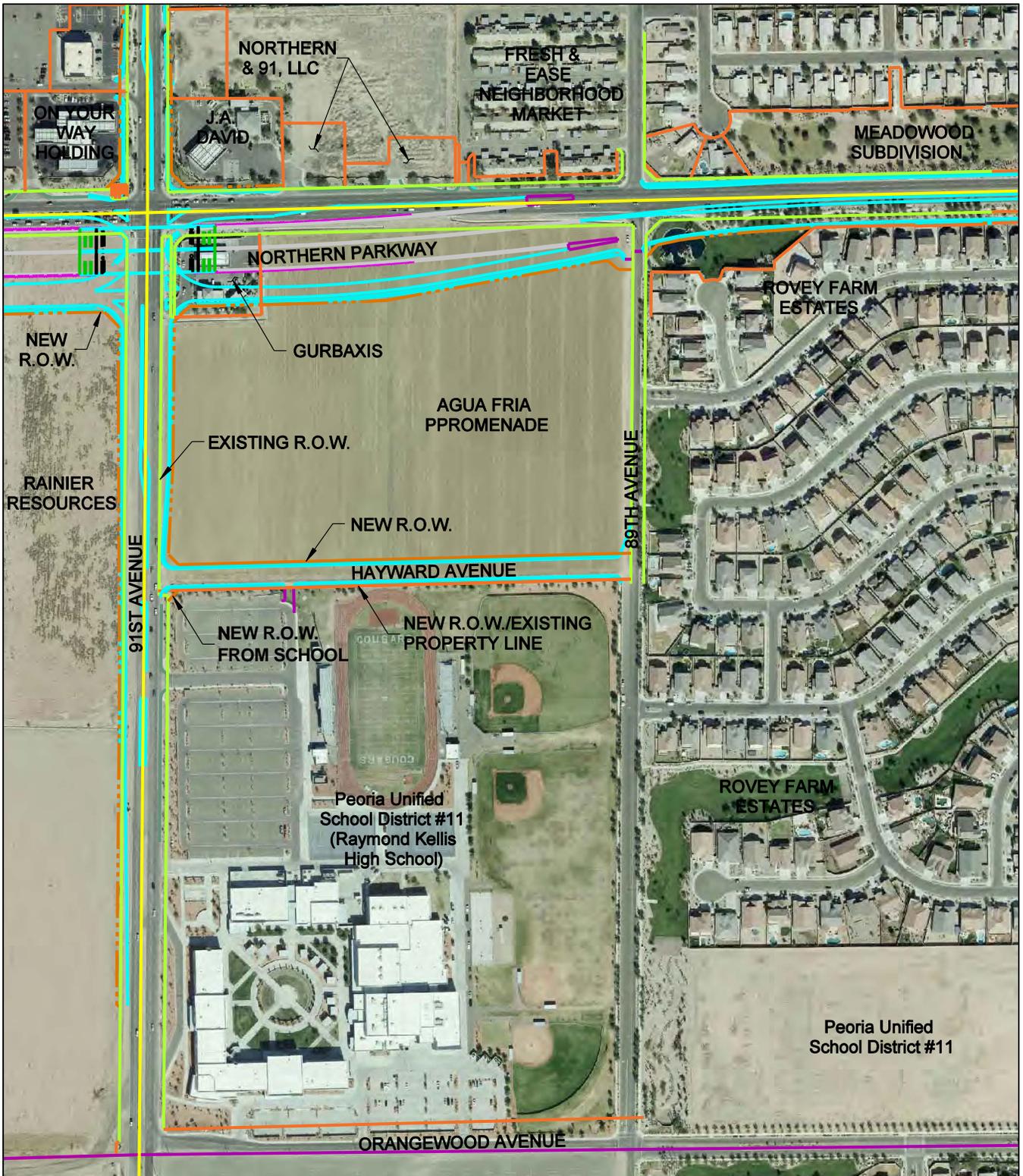
No Mitigation measures are required at Raymond Kellis High School.

Northern Horizon Park. This is a relatively new park located near 63rd Avenue and Northern Avenue. The land (approximately 35.6 acres) bounded by Northern Avenue to the north, 63rd Avenue to the east, and the BNSF Railway spur and Grand Avenue to the west is owned by the City of Glendale and is within a regional drainage basin (see Figure 4-9). The regional drainage basin was constructed by FCDMC in 2002 or 2003 as part of the Northern/Orangewood Storm Drain project. The primary purpose of these improvements is to store flood water.

The eastern half of the parkland along 63rd Avenue is currently developed while the west half of the park land along the BNSF Railway spur and Grand Avenue is not developed. The developed area, which is open to the general public, includes facilities for a dog park, playground, picnic areas, a youth bike skills safety course, and a paved parking area.

Future development planning of the western portion of the park area is limited. The development concept includes a trail along the perimeter of the park forming a loop. Desert landscaping and pedestrian lighting would be installed adjacent to the trail and be located between the park boundary and the top of bank of the drainage basin. The interior of the undeveloped park land would be seeded with native grasses. These improvements are considered conceptual at the current level of future planning, are not currently funded in the current City of Glendale Capital Improvement Plan, and may not be implemented until 10 to 15 years.

Alternatives 1, 2 and 3 of the proposed Northern Parkway improvements along Grand Avenue and along Northern Avenue would require approximately 0.9 acre of the undeveloped portion of the City Glendale proposed recreational land. The roadway improvements including pavement, curb and gutter, offset sidewalk and landscaping would require reconstruction of a portion of the drainage basin banks and relocation of headwalls for drainage pipes. The offset sidewalk and landscaping could be incorporated into the park trail loop.



Legend

- New Northern Parkway / Hayward Ave R.O.W. Line
- New Pavement Edge

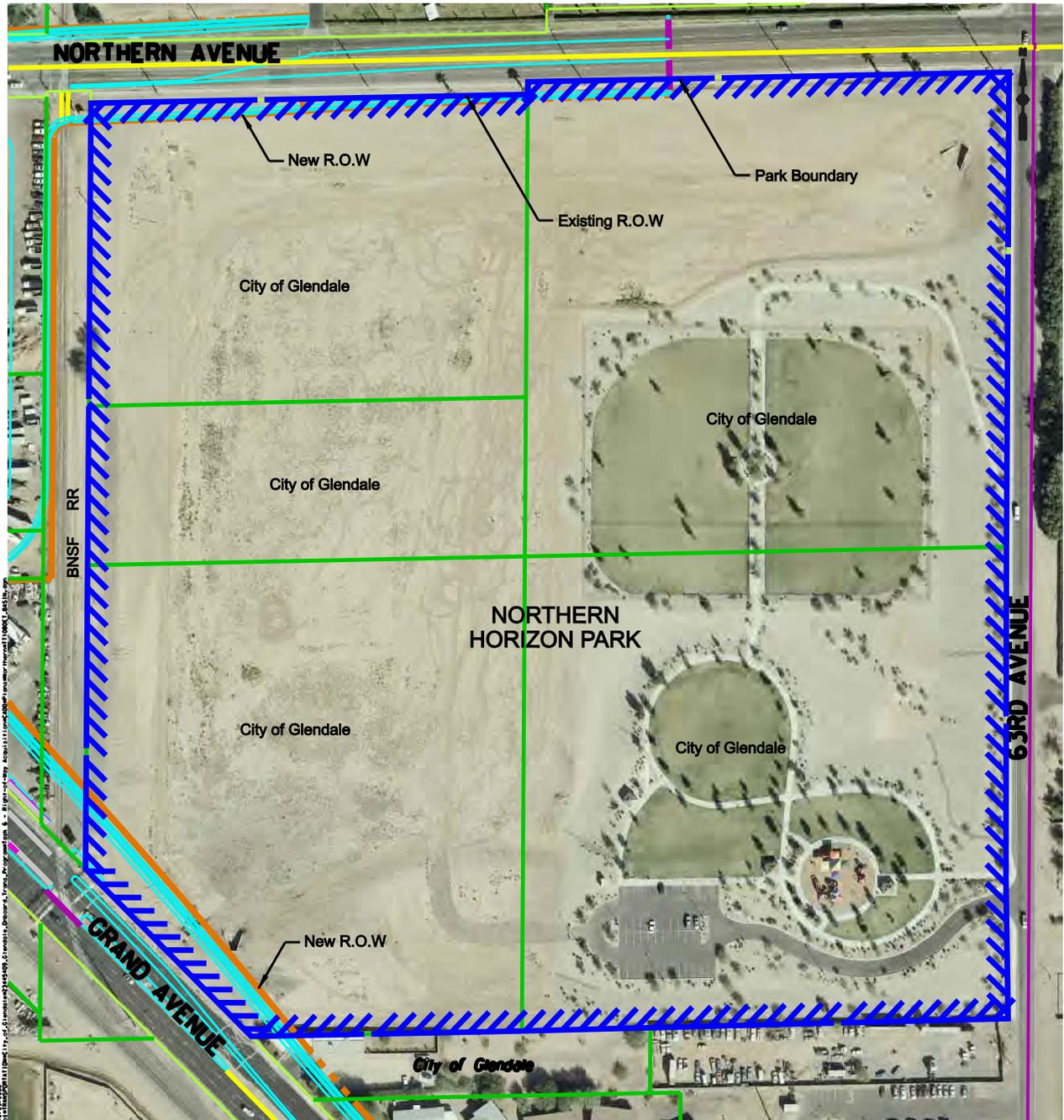


Raymond Kellis High School

Northern Parkway

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C

Figure 4-8



Legend

- ▬ Park Boundary
- ▬ Property Lines
- ▬ New R.O.W.



Northern Horizon Park

Northern Parkway

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C

Figure 4-9

On December 18, 2008, an initial coordination meeting was held with the City of Glendale Parks and Recreation staff. The purpose of the meeting was to discuss the proposed improvement alternatives to Northern Parkway and evaluate the potential impacts on Northern Horizon Park.

The primary use of this land is for flood control and not recreation since recreation is only a secondary use, this property is not a 4(f) resource. Further coordination with the City of Glendale will help mitigate any potential impacts with future park improvements.

No Build Alternative

With the No build Alternative, there would be no impacts to Section 4(f) properties, because the Northern Parkway Improvement Project would not be constructed or operated as a new transportation facility with federal funding.

4.6 VISUAL RESOURCES

4.6.1 Affected Environment

Existing conditions associated with visual resources are evaluated through assessment of landscape features and character, current views, and sensitive viewers in the study area. The following subsections contain a description of the landscape assessment.

Man made modifications dominate the study area with lesser occurrences of natural landscape. These include residential and commercial/industrial land uses, roadways, utilities, and flood diversion facilities. Numerous existing substations and high-voltage transmission line corridors, telephone and distribution power lines, communication towers, and the elevated US 60 and SR 101L compose a majority of the overhead infrastructure in the area. Most of the western portion of the study area is in cultivated agricultural use.

The character type of the study area, located northwest of the Phoenix metropolitan area in Maricopa County, is designated as Sonoran Desert landscape. The majority of the natural landscape settings can be characterized as relatively flat, open desert plains, dissected by intermittent riparian tributaries and isolated mountain and foothill lands. Two major watercourses that transport water intermittently in the study area include the Agua Fria River and the New River.

Residents are considered the most sensitive to the visual effects of this project. Dense residential development is located along Northern Avenue between 115th and 103rd avenues, where approximately seven subdivisions abut the proposed right-of-way and have views of Northern Avenue. In addition, residential areas east of 89th Avenue to 75th Avenue abut the proposed right-of-way and have views of Northern Avenue.

4.6.2 Environmental Consequences

Analysis of Alternatives 1 and 2

Residents located near proposed grade-separated intersections and elevated roadways may have their views obstructed by the overpasses. For residents who have views that are important to them (for example, views of distant mountains), these effects may be considerable. SR 101L and US 60 are part of the study area and can be characterized as commuter routes with limited scenic value. Potential effects on visual resources associated with Alternatives 1 and 2 are anticipated to be low, based on the limited scenic value of much of the study corridor.

Along the western portion of the study area, visual effects may occur where Alternatives 1 and 2 are elevated at the northwest corner of the Falcon Dunes Golf Course located adjacent to Reems Road. These effects may include a reduction in open-space views and visual intrusion on recreational users of the golf course. The elevated portion of the corridor between 143rd Avenue and Litchfield Road would visually impact eight homes located on the north side of the corridor. These homes have open views and a rural and agricultural character, which would be diminished, if not eliminated. The proposed grade-separated intersection at Dysart Road would offer few to no visual effects. While this location has north, south, and west views of the mountains in the study area, there are no current viewers.

Along the central portion of the study area, the proposed grade-separated intersection at El Mirage Road and the new facility would diminish open, unobstructed views of distant mountains. This area is largely industrial and lacks sensitive viewers; therefore, effects would be considered to be low. The proposed grade-separated intersection at 103rd Avenue and Northern Avenue would be situated in the vicinity of the Country Meadows Estates (a residential development) and a Coca-Cola plant. From 13 homes, the views of open space, the University of Phoenix Stadium, and regional mountains would be obstructed from 103rd Avenue to 104th Avenue. The Coca-Cola plant currently blocks residents' views from 104th Avenue to 105th Avenue. The proposed grade-separated intersection at 91st Avenue and Northern Avenue would offer few to no visual effects on the west of this grade-separated intersection.

Along the eastern portion of the study area, residences to the north and northeast of the proposed grade-separated intersection at 91st and Northern avenues have long-range views of mountains, the University of Phoenix Stadium, and agricultural fields. Those views would be blocked for approximately six residences.

The proposed grade-separated intersection at 83rd Avenue and Northern Avenue may impact mountain views and the open-space character of the Harvest Time Church at the northwest corner of this intersection. Also, five scattered rural residences would experience a reduction in

views and of the rural character that presently exists. The proposed grade-separated intersection at 75th Avenue and Northern Avenue would provide low visual contrast due to the industrial character of this area, which includes a power plant and high-voltage transmission lines. Residential structures within the right-of-way would be acquired; therefore, no effects would be realized.

The elevated ramp proposed to intersect with US 60 would provide low to no impact. This ramp is compatible with the existing elevated US 60 roadway, commercial activities, industrial operations, railroad tracks, and overhead transmission and distribution lines and would provide low contrast.

Analysis of Alternative 3

Effects on visual resources would be the same as those described for the western and eastern portions described under Alternatives 1 and 2; however, the central portion would differ.

Along the central portion of the study area, the elevated roadway proposed between Dysart Road and El Mirage Road and adjacent to Glendale Avenue would impact the mobile home park directly south of Glendale Avenue. These homes have limited north-facing views, and the roadway would affect the open and natural views from approximately 10 homes, due to their close proximity to the elevated roadway. Effects related to the proposed grade-separated intersection at 91st Avenue and Northern Avenue would be the same as those described for the central portion of Alternatives 1 and 2.

Analysis of the No Build Alternative

Based on general plans, residential and commercial development in the area would continue, which could impact scenic resources and views from existing residences.

Summary of Findings

Aerial imagery and field studies were used to determine the number of impacted viewers to achieve a quantifiable distinction among Alternatives 1, 2, and 3. The landscape features, character, and current views that constitute the overall scenic quality along the proposed new facility are such that Alternative 1, 2, or 3 would not affect visual resources greatly, but certain negative effects would occur in relation to the elevated portions of the corridor where sensitive viewers remain. Travelers along SR 303L, SR 101L, and US 60 would have unobstructed views of the proposed new facility. Under Alternatives 1 and 2, approximately 34 sensitive viewers would be affected, whereas under Alternative 3, approximately 31 sensitive viewers would be affected. Therefore, Alternative 3 would have a lesser impact on visual resources than would Alternatives 1 and 2.

4.6.3 Mitigation

Effects on visual resources would be minimized under all three build alternatives by implementing the following mitigation measures:

- The Maricopa County Department of Transportation would ensure that the project is designed according to Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction* (2008), Section 104, "Scope of Work," Subsection 09, "Prevention of Landscape Defacement: Protection of Streams, Lakes, and Reservoirs," which states "the Contractor shall give special attention to the effect of its operations on the landscape and shall take special care to maintain natural surroundings undamaged."
- During the design phase, the Maricopa County Department of Transportation would ensure that landscape and aesthetic treatment plans would be reviewed and approved by the City of Glendale, City of El Mirage, City of Peoria, and the Arizona Department of Transportation.

4.7 NOISE

An analysis of potential noise impacts was considered within the project area, pursuant to the current ADOT Noise Abatement Policy (NAP), December 5, 2005, and Addendum to the ADOT NAP, August 24, 2007. This policy is based on currently accepted practices and procedures by federal and state transportation agencies to assess and mitigate potential highway-related noise levels.

The FHWA has issued regulations for traffic noise evaluation in 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. The main objectives of 23 CFR 772 are "to provide procedures for noise studies and noise abatement measures, to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways approved pursuant to Title 23, United States Code." The regulations require the consideration of noise abatement measures when traffic noise effects are identified. The FHWA has developed specific noise abatement criteria. These criteria are provided in Table 4-3 below.

Table 4-3
Noise Abatement Criteria

Land Use Category	Design Noise Level $L_{eq}(h)$ dBA	Description of Land Use Category
B	67 dBA (exterior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, playgrounds, active sports areas, and parks.

SOURCE: Federal Highway Administration, Title 23 Code of Federal Regulations Part 772

NOTES: $L_{eq}(h)$ = the one-hour equivalent sound level
dBA = A-weighted decibel(s)

A technical analysis of noise for this project has been documented in *Traffic Noise Analysis, Northern Parkway, Maricopa County, Arizona*, prepared for the City of Glendale on November 22, 2006.

4.7.1 Affected Environment

The weighted sound level corresponding to the human ear is designated as the A-weighted sound in decibels, or dBA. Generally, changes in noise levels of 3 dBA barely would be perceived by most listeners, whereas a 10 dBA change normally is perceived as a doubling of noise levels. Typical sound levels experienced by people range from about 40 dBA, the daytime level in a typical quiet living room, to 85 dBA, the approximate level occurring near the sidewalk adjacent to heavy traffic. (Refer to Appendix B for additional details on noise levels and model calculations.)

Existing Noise-Sensitive Land Uses

The study area is composed of residential, commercial, industrial and agricultural land uses as well as several publicly and privately owned undeveloped parcels. There is a matrix of existing land uses located adjacent to the four alignment alternatives under consideration, Alternative 1, Alternative 2, Alternative 3, and the No Build Alternative. The number of noise-sensitive land uses by alignment alternative is listed in Table 4-4.

Table 4-4
Approximate Number of Noise-Sensitive Land Uses
by Alignment Alternative

FHWA Land Use Category	Land Use Description	Approximate Number of Units or Parcels Located Adjacent to Alignment			
		Alternative 1	Alternative 2	Alternative 3	No Build Alternative ¹
<i>Sarival Avenue to Dysart Road</i>					
B	Residences, schools, churches, hospitals, parks, recreation areas, etc.	5	5	5	5
<i>Dysart Road to 91st Avenue</i>					
B	Residences, schools, churches, hospitals, parks, recreation areas, etc.	94	94	13	107
<i>91st Avenue to U.S. Highway 60</i>					
B	Residences, schools, churches, hospitals, parks, recreation areas, etc.	87	87	87	87

SOURCE: Federal Highway Administration, Title 23 Code of Federal Regulations Part 772

NOTES: ¹ As a conservative estimate, the number of noise-sensitive land uses associated with the No Build Alternative represents the total of Alternatives 1 and 2 where they do not coincide and the same number where they do coincide.

FHWA = Federal Highway Administration

The noise measurement data and traffic counts recorded during the measurement interval were used to calibrate the FHWA- and ADOT-approved Traffic Noise Model, version 2.5, before establishing peak traffic-hour noise levels. A detailed discussion of model inputs and calibration can be found in the *Noise Analysis Technical Report* conducted for this draft EA. Model inputs and calibration are necessary because the model establishes existing noise levels based on current peak traffic-hour volumes (not traffic counts recorded during measurements), which are used in determining future noise effects. Model calculations of the existing peak traffic noise level at receivers in the study area are given in the table provided in Appendix B.

Along the western portion of the study area (Sarival Avenue to Dysart Road), there are five Category B land uses in the vicinity of Alternatives 1, 2, and 3. Existing noise levels in the western portion range between 45 dBA at receiver locations R1 and R2 (representing two farmhouses located away from any existing major traffic source) and 64 dBA at locations R3 to R5 (representing single-family residences located along Northern Avenue at 143rd Avenue and 134th Avenue, respectively). These locations are shown in Figure B-1b, Panel 1, and Figure B-1c, Panel 2, in Appendix B.

Along the central portion of the study area (Dysart Road to 91st Avenue), there are 94 Category B land uses in the vicinity of Alternatives 1 and 2. For Alternative 3, there are 13 Category B land uses in the vicinity. The No Build Alternative includes 107 Category B land uses in the vicinity. Receiver locations are shown in Appendix B in Figure B-1j, Panel 9, for Alternative 3 and in Figure B-1d and Figure B-1c, Panels 3 and 4, for Alternatives 1 and 2.

Along the eastern portion of the study area (91st Avenue to US 60), there are 87 Category B land uses in the vicinity of the Alternatives 1 and 2. Alternative 3 coincides with the Alternatives 1 and 2 in this area; therefore, an identical number of land uses are present. The No Build Alternative includes the same number of land uses by category.

Noise-Sensitive Planned Land Uses

In the western portion of the study area there are undeveloped parcels designated as employment and regional commercial centers between Northern Avenue and Olive Avenue west of Dysart Road. No additional Category B land uses are planned in the western portion; therefore, Alternatives 1, 2 and 3, and the No Build Alternative do not have the potential to affect Category B land uses based on current land use plans.

In the central portion of the study area there will be additional residential development on the north side of Northern Avenue between 115th Avenue and 111th Avenue and between 107th Avenue and SR 101L. Alternatives 1 and 2, and the No Build Alternative have the potential to impact these additional Category B noise-sensitive land uses.

In the eastern portion of the study area there will be additional residential development on the south side of Northern Avenue between 91st Avenue and 75th Avenue. Alternatives 1 and 2 and the No Build Alternative have the potential to affect these additional Category B noise-sensitive land uses.

4.7.2 Environmental Consequences

Noise Impact Criteria

Potential traffic noise impacts are assessed on the basis of future project-related noise levels approaching or exceeding criteria contained in local, state, or federal guidelines. For the proposed alignment, the criteria contained in the ADOT NAP dated December 5, 2005, have been applied.

According to the FHWA regulations, a traffic noise impact occurs when the predicted traffic noise level approaches or exceeds the Noise Abatement Criteria (NAC) for the specified land use. In addition, an impact occurs when the predicted traffic noise level substantially exceeds the

existing noise level. The FHWA allows each state to define the levels at which the noise “approaches” the criteria and when it “substantially exceeds” the existing noise level. The ADOT NAP has defined “approaching” as 3 dBA below the FHWA NAC for residential or other similar sensitive land use areas [Land Use Category B (exterior)].

Analysis of Alternatives 1 and 2

Environmental consequences for noise receptors under Alternatives 1 and 2 include potential increased traffic noise to existing noise-sensitive land uses in the study area. To determine the extent of potential effects, vehicle mix, roadway geometry, and vehicle speeds were entered into the Traffic Noise Model. The model was used to establish peak traffic-hour noise levels for Alternatives 1, 2, and 3 and the No Build Alternative at receiver locations to determine potential noise effects on the Category B land uses they represent. A comparison of potential noise effects is discussed for each of the alternatives.

In the western portion of the study area roadway design and traffic control measures occur, and predicted future traffic volumes vary between Alternatives 1 and 2 throughout the study area. Alternative 1 is predicted to increase noise levels at receiver locations R1 and R2 (farmhouse) by 19 dBA and 25 dBA, respectively, while the remaining receivers are within the proposed right-of-way and would be removed by this alternative. Alternative 2 is predicted to increase noise at locations R1 and R2 (farmhouse) by 20 dBA and 26 dBA, respectively. Predicted future noise levels at both locations exceed the ADOT NAC for Category B land uses.

In the central portion of the study area Alternative 1, which includes traffic signals at 111th and 107th avenues, is predicted to increase existing noise levels at receivers by 2 to 12 dBA. Design-year peak traffic-hour noise levels range between 63 to 76 dBA, exceeding the ADOT NAC for Category B land uses at 27 of 34 locations examined. Three receivers within the proposed right-of-way would be removed by this alternative. Alternative 2, a limited-access facility that allows more peak-hour free flow of traffic, is predicted to increase existing noise at receivers by 3 to 13 dBA, exceeding the ADOT NAC for Category B land uses at 28 of 34 locations examined and three removed receivers.

In the eastern portion of the study area Alternative 1 is predicted to increase existing noise levels at receivers by 5 to 11 dBA. Design-year peak traffic-hour noise levels range between 64 to 73 dBA, exceeding the ADOT NAC for Category B land uses at 33 of 44 locations examined. Eleven receivers within the proposed right-of-way would be removed by this alternative. Alternative 2 is predicted to increase existing noise at receivers by 6 to 12 dBA, exceeding the ADOT NAC for Category B land uses occurring at 33 of 44 locations examined and three receivers removed.

Analysis of Alternative 3

In the western portion of the study area Alternative 3 coincides with the Alternatives 1 and 2; therefore, identical effects on Category B land uses occur.

In the central portion of the study area Alternative 3 is estimated to increase existing noise levels at receivers by 1 to 2 dBA; however, the major contribution is attributable to future peak traffic volumes on Glendale Avenue. Design-year peak traffic-hour noise levels are estimated at 64 to 65 dBA, exceeding the ADOT NAC for Category B land uses occurring at two of three locations examined. One receiver within the proposed right-of-way would be removed by this alternative. The estimates of future levels at receiver locations R81 and R82 are based on their relative proximity to Alternative 3 in comparison with the proximity of similar receivers to Alternatives 1 and 2.

In the eastern portion of the study area Alternative 3 coincides with Alternatives 1 and 2; therefore, identical effects on Category B land uses occur.

Analysis of the No Build Alternative

In the western portion of the study area the No Build Alternative is predicted to increase noise levels at receivers by 2 to 4 dBA. Future noise levels at three of five receivers are predicted to exceed the ADOT NAC for Category B land uses. Future peak traffic-hour noise levels range between 49 to 66 dBA due to predicted growth in traffic on existing surface streets.

In the central portion of the study area the No Build Alternative is predicted to increase existing noise levels at receivers by 1 to 7 dBA. Future peak traffic-hour noise levels are predicted in the range of 58 to 67 dBA, exceeding the ADOT NAC for Category B land uses occurring at 15 of 34 locations examined. Future peak traffic-hour noise levels are due to predicted growth in traffic on existing surface streets.

In the eastern portion of the study area the No Build Alternative is predicted to increase existing noise levels at receivers by 2 to 5 dBA. Future peak traffic-hour noise levels are predicted in the range of 58 to 75 dBA, exceeding the ADOT NAC for Category B land uses occurring at 32 of 44 locations examined. Future peak traffic-hour noise levels range between 49 to 66 dBA due to predicted growth in traffic on existing surface streets.

Summary of Findings

The number of receptors potentially affected by traffic noise varies for Alternatives 1, 2, and 3, and the No Build Alternative. There are approximately 186 Category B land uses in the vicinity of Alternatives 1 and 2, and 105 Category B land uses in the vicinity of Alternative 3. Ninety-

two of the Category B land uses are common to Alternatives 1, 2, and 3. The No Build Alternative encompasses all Category B land uses in the vicinity of Alternatives 1, 2, and 3, with a total of 199 Category B land uses located in the vicinity of one or more of the proposed alternatives. These land uses are represented by 83 receivers located throughout the study area.

Future peak traffic-hour noise levels are predicted to exceed the ADOT NAC for Category B land uses at 62 of 83 receiver locations examined for Alternative 1. For Alternative 2, the number of predicted future effects increases by one. For the No Build Alternative, the number of predicted future effects decreases by 13. Therefore, Alternative 2 has the highest potential for impacting Category B land uses among the alternatives examined for this project. Project-related effects are not anticipated as a result of Alternative 3.

4.7.3 Mitigation

Effects on noise would be minimized under all three build alternatives by implementing the following mitigation measures:

- The Maricopa County Department of Transportation would ensure that noise abatement measures that may be required for the selected alternative are reasonable and feasible, in accordance with Federal Highway Administration regulations and the current Arizona Department of Transportation's Noise Abatement Policy. Actual types and locations of noise abatement mitigation would be analyzed in more detail during subsequent design phases for the preferred alternative.
- The Maricopa County Department of Transportation's Contractor would ensure that construction noise would be controlled in accordance with the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 104.08 (2008), special provisions, and local rules or ordinances.
- The Maricopa County Department of Transportation's Contractor would ensure that each internal combustion engine used for any purpose on the project, or related to the project, would be equipped with a muffler recommended by the manufacturer.
- The Maricopa County Department of Transportation's Contractor would ensure that noise abatement measures are reasonable and feasible to be recommended for implementation in accordance with the Federal Highway Administration's regulations and Arizona Department of Transportation's Noise Abatement Policy.

4.8 CULTURAL RESOURCES

4.8.1 Affected Environment

Regulations implementing NEPA stipulate that federal agencies consider the consequences of their undertakings (such as providing federal funds for the proposed project) on historical and cultural resources (40 CFR 1502.16[g]). Section 106 of the National Historic Preservation Act requires that federal agencies also consider the effects of their undertakings on properties eligible for the National Register of Historic Places (National Register). Regulations for *Protection of Historic Properties* (36 CFR 800) implement Section 106 by defining procedures for agencies to consult with the State Historic Preservation Officer and other interested parties.

To be considered for inclusion in the National Register, properties must be at least 50 years old (unless they have exceptional significance) and possess integrity of location, design, setting, feeling, materials, workmanship, and association. To be eligible, properties must meet one or more of the following criteria to demonstrate their significance in American history, architecture, archaeology, engineering, or culture:

- Criterion A Be associated with significant historical events or trends
- Criterion B Be associated with historically significant people
- Criterion C Have distinctive characteristics of style or type or have artistic value
- Criterion D Have yielded, or have potential to yield, important information
(36 CFR 60.4)

A cultural resource records and literature review (Erickson and Rogge 2006) was completed at an early stage of project planning as alternatives were being defined. Subsequently, a sample archaeological survey and an evaluation of historical buildings and structures (Erickson and others 2008) was completed to provide information for evaluating the project alternatives assessed in this EA and also to support Section 106 consultations. The area of potential effects for construction impacts was defined as those areas that could be disturbed by construction or demolition activities. The area of potential effects for visual and noise impacts on the historical integrity of cultural resources was defined as the parcels of property adjacent to the alternative routes.

Historical Buildings and Structures

Prior studies had identified two historical structures that all alternatives would cross in the eastern part of the project: the Santa Fe, Prescott & Phoenix Railway (now operated as the BNSF Railway) and U.S. Highway 60/89. The railroad has been evaluated as eligible for the National

Register under Criterion A for its association with the history of transportation in Arizona, and the highway, as part of the historic state highway system developed between 1912 and 1955, has been evaluated as eligible under Criterion D for its potential to yield important information about the state highway system. Both the railroad and highway have been highly modified and upgraded for continuing use and, except for their location, they retain little historical integrity within the area of potential effects.

Because historical buildings had not been previously surveyed along the alternative routes, historic age properties were identified by reviewing Maricopa County assessor records. Because construction of project would be phased, the historic period was defined differently for the western, central, and eastern parts of the project. The western segment that would be used by all alternatives and the central parts of Alternatives 1 and 2 are scheduled for completion in 2013. At that time, buildings constructed in 1963 or earlier would be 50 years old and meet the minimum age requirement for National Register consideration. Components of the project between 99th Avenue and 103rd Avenue might not be finished until 2030, and therefore the historical period for that part of the project was defined as 1980 or earlier. The eastern portion of the study area is not scheduled to be completed until 2025. Accordingly, the historical period for that part of the project was defined as 1975 and earlier. The County Assessor records identified 32 parcels adjacent to the alternative alignments as having buildings constructed during the defined historical periods. Evaluation of those 32 properties concluded that none were eligible for the National Register.

Archaeological Sites

The records and literature review indicated that the potential for intact archaeological resources was low along most parts of the alternative routes. Most prehistoric sites would have been shallow artifact scatters, perhaps with simple features such as hearths or cooking pits, and agricultural and subsequent urban development is likely to have destroyed those types of sites. The one area with greater potential for archaeological resources is where the routes cross the Agua Fria River and New River. Hohokam habitation sites have been recorded along those rivers. Prior surveys along the route that would be used by Alternatives 1 and 2 recorded such sites on the east and west sides of the Agua Fria River. A sample archaeological survey was conducted along the central parts of the route that would be used by Alternatives 1 and 2, and the Alternative 3 route, where they cross the Agua Fria River and New River. Because potential effects on archaeological sites in other areas were not deemed a critical factor in evaluating alternatives, the other parts of the alternatives were not surveyed intensively for archaeological resources at this stage of project planning. The sample survey determined that the central part of the route that would be used by Alternatives 1 and 2 is highly disturbed and none of the previously recorded Hohokam archaeological sites extend into the project corridor. The sample

survey, however, did discover a prehistoric Hohokam artifact scatter along the edge of the corridor. The sample survey also discovered two scatters of prehistoric flaked stone and a historic-period trash dump along the central part of the Alternative 3 route. The three prehistoric sites were evaluated as eligible for the National Register under Criterion D because they might have potential to yield important information about the prehistoric occupation of the region. The historic-period trash dump has been evaluated as lacking significant historic values and is considered ineligible. (FHWA and ADOT are consulting with the State Historic Preservation Office and other interested parties about the eligibility evaluations.

4.8.2 Environmental Consequences

Analysis Criteria

Assessment of potential effects on National Register-eligible properties was based on criteria defined by regulations for *Protection of Historic Properties* (36 CFR 800). Those regulations define an effect as a direct or indirect alteration of the characteristics of a historic property that qualify it for inclusion in the National Register. Effects are adverse when the alterations diminish the integrity of a property's location, design, setting, materials, workmanship, feeling, or association. Examples of adverse effects include the following:

- Physical destruction, damage, or alteration of all or part of the property
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36 CFR 68) and applicable guidelines
- Removal of the property from its historical location
- Change of the character of the property's use or of physical features in the property's setting that contribute to its historical significance
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features
- Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an American Indian tribe or Native Hawaiian organization
- Transfer, lease, or sale of the property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance [36 CFR 800.5 (a)(2)]

The criteria of adverse effect were applied to each of the five National Register-eligible resources identified within the area of potential effects of the three alternatives.

Analysis of the No Build Alternative

If the No Build Alternative were selected, there would be no effect on historic properties listed in or eligible for the National Register.

Analysis of Build Alternatives

No National Register-eligible properties have been identified along the western portion of the study area, but most of the route has not been surveyed intensively for archaeological resources. A records and literature review, however, documented that prior surveys in the vicinity found few archaeological resources, indicating that there is little potential for significant intact archaeological resources to be present along the route.

An intensive survey along the central part of the route that would be used by Alternatives 1 and 2 discovered one archaeological site. It is a scatter of Hohokam potsherds and flaked stone, located along the south side of the route that would be used by Alternatives 1 and 2. The site has potential to yield important information about the Hohokam occupation of the region, and is considered eligible for the National Register under Criterion D. Construction activities are likely to disturb the site.

A sample archaeological survey of a 400-foot-wide corridor along the central part of the Alternative 3 route found two archaeological sites. One is a scatter of prehistoric flaked stone, and the other is a scatter of flaked and ground stone. The lack of pottery indicates that these sites might date to the Archaic period (that is, more than 2,000 years ago). Both sites have the potential to yield important information about the prehistoric occupation of the region and are evaluated as eligible for the National Register. Construction of the central part of Alternative 3 is likely to disturb at least parts of both sites. The sample survey covered most of, but not the entire, central portion of the Alternative 3 study area. Therefore, additional archaeological sites might be present along this portion, but most of the unsurveyed area has been disturbed, indicating the potential for additional intact sites is low.

The route that would be used for the eastern segment of all alternatives crosses the National Register-eligible Santa Fe, Prescott & Phoenix Railway (now operated as the BNSF Railway) and US 60/89. Both the railroad and highway remain in use and are highly modified in the project area. Except for their location, the railroad and highway retain little historical integrity within the area of potential effects. The project would involve construction of an elevated ramp (flyover) that would connect Northern Parkway to Grand Avenue. The flyover would carry

Northern Parkway traffic above the overpass that carries 67th Avenue traffic over Northern Avenue, Grand Avenue, and the BNSF Railway (originally the Santa Fe, Prescott & Phoenix Railway)]. Two pier supports for the flyover structure would be built within or partially within the railroad right-of-way, In addition to the flyover, widening and shifting of Northern Avenue and Grand Avenue adjacent to the flyover would require widening of the Northern Avenue at-grade crossing of the railroad.

Construction of the flyover and widening of the at-grade Northern Avenue crossing would not affect any historic materials, design, or workmanship of the railroad, and the setting and feeling of this segment of the railroad have been substantially modified by urban development and the recent construction of the adjacent 67th Avenue overpass. Consultations pursuant to Section 106 of the National Historic Preservation Act concluded that the flyover and widening of the Northern Avenue crossing of the railroad would not adversely affect any historic characteristics that make the Santa Fe, Prescott & Phoenix Railway eligible for the National Register. [All three build alternatives also would cross two historic-age spur lines of the BNSF Railway but both were evaluated as lacking historical significance and not eligible for the National Register.

The eastern part of the project area has not been surveyed completely for archaeological resources. A records and literature review, however, indicated that prior surveys have encompassed much of the route that would be used by all three alternatives, and no archaeological resources have been recorded. The results of the prior surveys indicate that there is little potential for significant intact archaeological resources along that route.

Summary of Findings

The project is not expected to adversely affect any historical buildings or structures eligible for the National Register. Construction of Alternatives 1 and 2 is likely to adversely affect at least one archaeological site. Additional sites could be identified in the unsurveyed parts of area of potential effects for construction impacts, but the potential for discovering more archaeological sites is estimated to be low. Construction of Alternative 3 could adversely affect at least two archaeological sites, and additional sites could be identified in unsurveyed parts of the area of potential effects for construction impacts, although the potential is rated as low. Regardless of which alternative is selected for construction, there is good potential to mitigate the effects on archaeological sites satisfactorily through data recovery studies that would be developed and implemented pursuant to a Section 106 programmatic agreement. Because there is good potential to mitigate any adverse effects satisfactorily, the effects on cultural resources do not constitute a significant environmental impact.

4.8.3 Mitigation

The project is likely to disturb one or two known archaeological sites, depending on which alternative is selected. Because the survey is not complete, it is possible that other archaeological sites could be identified within the area of potential effects for construction impacts, but the potential for additional sites is evaluated as low. It is anticipated that those impacts would be satisfactorily mitigated through studies to recover and preserve artifacts and information.

Pursuant to regulations for *Protection of Historic Properties* (36 CFR 800), FHWA executed a programmatic agreement with the State Historic Preservation Office and other interested parties (see Appendix C). The agreement stipulates procedures for addressing effects on cultural resources eligible for the National Register by completing the inventory of cultural resources and developing and implementing a treatment plan in conjunction with preparation of a final design.

4.9 AIR QUALITY

The 1990 Clean Air Act amendments and NEPA require that air quality effects be addressed in the preparation of environmental documents. The level of effort used to evaluate these effects might vary from a simplified description to a detailed microscale analysis depending on factors such as the type of document to be prepared, the project location and size, the meteorology of the study area, the area's air quality attainment status, and federal and state air quality standards.

4.9.1 Affected Environment

Nonattainment/Maintenance Areas

The Clean Air Act amendments of 1990 authorized the U.S. Environmental Protection Agency (EPA) to designate those areas that have not met the National Ambient Air Quality Standards (NAAQS) as nonattainment areas and to classify them according to their degree of severity. States that fail to attain the NAAQS for any of the criteria pollutants are required to submit state implementation plans that outline those actions that will be taken to attain compliance.

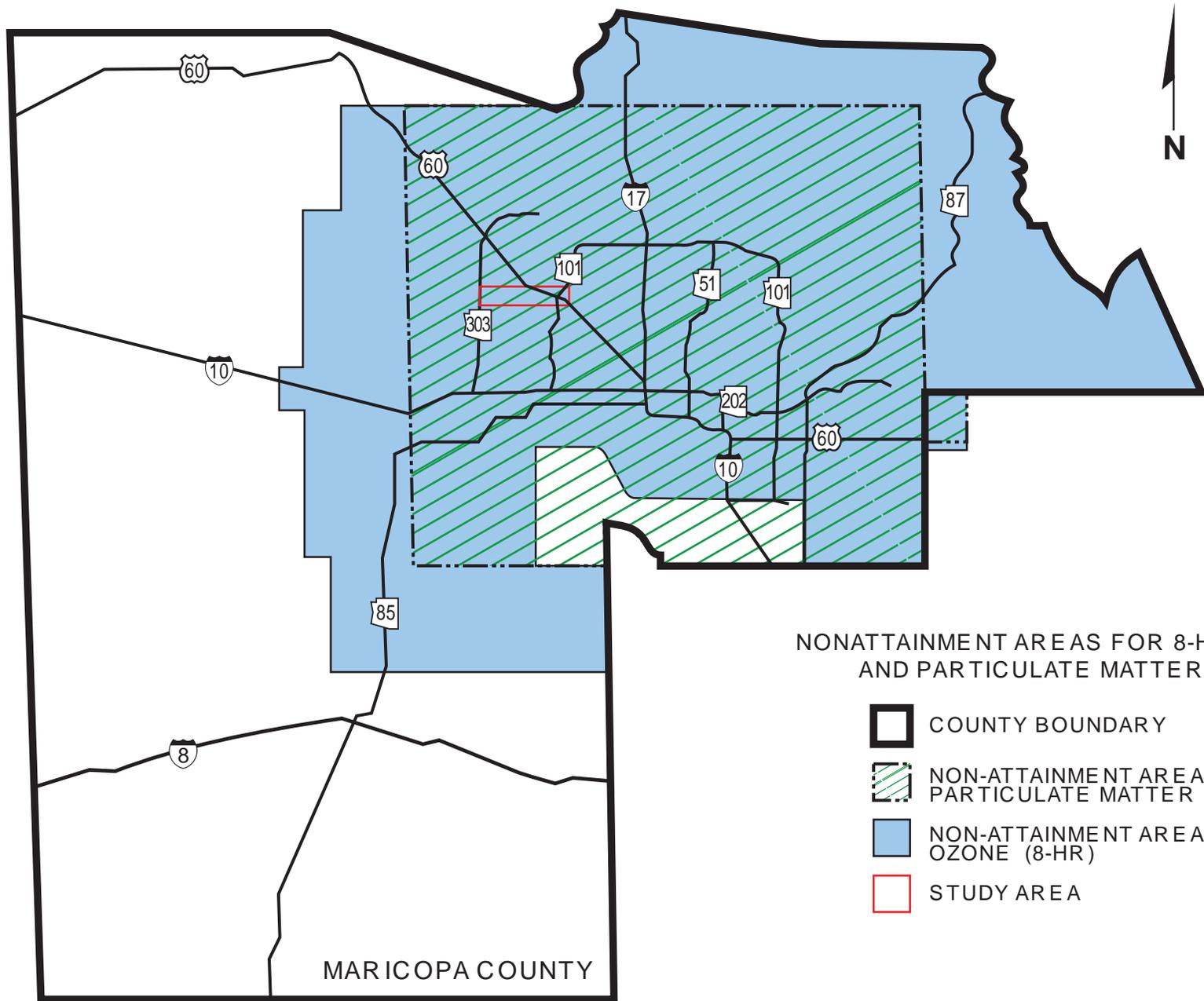
The study area lies within nonattainment areas for ozone and particulate matter equal to or smaller than 10 microns in diameter (PM₁₀). The nonattainment area for eight-hour ozone is a large area of Maricopa County and a small portion of Pinal County. The nonattainment area for PM₁₀ is an approximately 48-by-60-mile rectangular section of eastern Maricopa County plus a 6-by-6-mile section that includes the city of Apache Junction in Pinal County.

The study area also lies within an area that formerly was a nonattainment area for carbon monoxide (CO), but has been reclassified as a maintenance area. A maintenance area is defined as an area that has met the NAAQS for a particular criteria pollutant but must continue to meet the NAAQS for a defined period before it can be reclassified as an attainment area.

Ambient Air Quality Levels

The Maricopa County Air Quality Department and the Arizona Department of Environmental Quality (ADEQ) maintain a network of air quality monitoring sites throughout Maricopa County; the majority of these sites are located in Phoenix and the surrounding communities. Monitoring sites are not necessarily identical; some might only monitor one or two of the criteria pollutants. Air quality data from two locations were selected for presentation due to the pollutants monitored and/or their relative proximity to the study area. Concentrations obtained at these locations during 2005 are summarized in Figure 4-10.

During 2005, none of the maximum concentrations obtained at the two locations exceeded the NAAQS. Maximum concentrations of CO were well below the NAAQS. As illustrated in Table 4-5, maximum 24-hour concentrations of PM₁₀ observed at these locations during 2005 were below the standard; annual averages also were below the standard. Maximum concentrations of ozone were also below the NAAQS.



NONATTAINMENT AREAS FOR 8-HOUR OZONE AND PARTICULATE MATTER (PM₁₀)

-  COUNTY BOUNDARY
-  NON-ATTAINMENT AREA FOR PARTICULATE MATTER (PM₁₀)
-  NON-ATTAINMENT AREA FOR OZONE (8-HR)
-  STUDY AREA

MARICOPA COUNTY

Not to Scale

Table 4-5
Air Quality Summary: 2006
Maximum Ambient Concentrations: ug/m³ (ppm)
Maricopa County, Arizona

Location	Pollutant	Averaging Time	Concentration	No. of Exceedances
Bell/Dysart roads Surprise, Arizona No. 1	PM ₁₀	Annual	29.0 ug/m ³	0
		24-hour	76 ug/m ³	0
6000 West Olive Ave Glendale, Arizona No. 2	Ozone	1-hour	0.082 ppm ^a	0
		8-hour	0.073 ppm ^a	0
	CO	1- hour	1.7 ppm ^b	0
		8-hour	1.3 ppm ^b	0
	Ozone	1-hour	0.096 ppm ^a	0
		8-hour	0.078 ppm ^a	0
	CO	1-hour	3.2 ppm ^b	0
		8-hour	2.4 ppm ^b	0
	PM ₁₀	Annual	29.0 ug/m ³	0
		24-hour	84 ug/m ³	0

SOURCE: Maricopa County Air Quality Division 2006

NOTES: ^a Seasonal average: April 1 to November 1

^b Seasonal average: September 1 to April 1

CO = carbon monoxide

ug/m³ = micrograms per cubic meter

No. = number

PM₁₀ = particulate matter equal to or smaller than 10 microns in diameter

ppm = parts per million

The remaining criteria pollutants (sulfur dioxide [SO₂], particulate matter equal to or smaller than 2.5 microns in diameter [PM_{2.5}], and lead) were not monitored in the immediate vicinity. No standards were exceeded for SO₂ and PM_{2.5} at monitoring locations in Maricopa County; monitoring for lead in Maricopa County was discontinued in 1997.

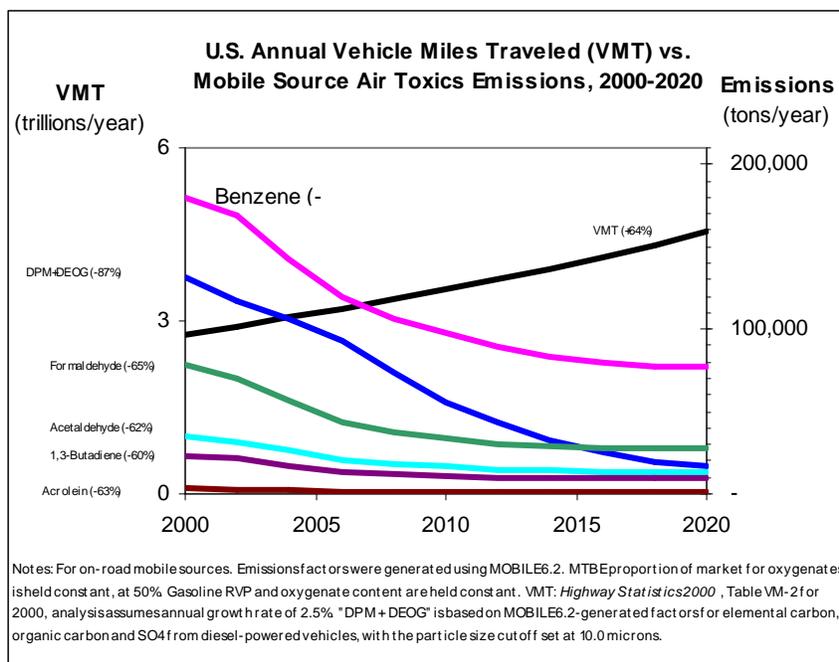
Mobile Source Air Toxics

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

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted into the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of

fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the effects 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. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in the following graph:



As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

Emissions

The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

Dispersion

The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

Exposure Levels and Health Effects

Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupported assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Carbon Monoxide (CO)

The air quality analysis performed to assess impacts from Alternatives 1 and 2 examined the local (project level) vehicle emissions of CO. Other pollutants, such as ozone, nitrogen oxides, and hydrocarbons are pollutants that are regional in nature; and as such, meaningful evaluation at the project level is not possible. The EPA is in the process of developing procedures for analyzing microscale PM₁₀ effects, but federal rules (40 CFR 93.123[b][4]) state that requirements for quantitative PM₁₀ analysis will not take effect until EPA develops these procedures.

A microscale analysis of Alternatives 1 and 2 was performed using the model CAL3QHC version 2. This line-source air quality model was developed for the EPA's Office of Air Quality Planning and Standards to predict concentrations of inert pollutants, such as CO, near highways and arterial streets due to emissions from both moving and idling vehicles (EPA, Office of Air Quality Planning and Standards 1992). Ambient concentrations of CO were estimated for the existing traffic conditions and roadway configuration during 2006 (existing); for the estimated traffic conditions and roadway configuration during 2030 (No Build Alternative); and for the estimated traffic conditions and roadway configuration in 2030 (Alternatives 1 and 2). Three intersections were selected for detailed analysis based on their poor level of service and large projected traffic volumes. The intersections were at US 60/Northern Avenue/67th Avenue, 99th Avenue/Northern Avenue, and Litchfield Road/Northern Avenue. A qualification of potential

effects was performed for Alternative 3. A detailed discussion of the analysis is provided in the supporting technical report (Appendix D).

Particulate Matter (PM₁₀)

The EPA has not yet released modeling guidance for performing quantitative “hot spot” analysis for project-level transportation projects, and it is not currently required under 40 CFR 93.123(b)(4). Transportation projects that are within PM₁₀ nonattainment or maintenance areas do require a qualitative analysis that “must document that no new local PM₁₀ violations will be created and the severity or number of existing violations will not be increased as a result of the project” (FHWA 2006a). The qualitative analysis might involve the comparison of the project to an area with similar characteristics, review of findings from air quality studies that might have been performed, or other qualitative approaches. The qualitative analysis for this project examined the areas that might be impacted under Alternatives 1, 2, and 3 and the No Build Alternative.

Other Criteria Pollutants

Potential effects from other criteria pollutants associated with vehicular emissions cannot be quantified until analytical procedures have been developed and approved by the EPA and FHWA.

Mobile Source Air Toxics

A basic analysis was conducted of the likely MSAT emission impacts from Alternatives 1 and 2. However, available technical tools do not enable prediction of project-specific health impacts of the emission changes associated with the alternatives in this draft EA. Due to these limitations, the discussion below is included in accordance with Council of Environmental Quality (CEQ) regulations (40 CFR 1502.22[b]) regarding incomplete or unavailable information.

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling (to estimate ambient concentrations resulting from the estimated emissions), exposure modeling (to estimate human exposure to the estimated concentrations), and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project. Refer to Appendix D for further details regarding MSATs.

Even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project to give a broad, nonspecific basis for identifying and comparing the potential

differences among MSAT emissions—if any—from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA (2006b).

4.9.2 Environmental Consequences

Analysis of Alternatives 1 and 2

Carbon Monoxide (CO)

For the current configuration in 2006, the highest predicted maximum one-hour concentration of CO was 5.4 parts per million (ppm); this was estimated for a location at the intersection of US 60/Northern Avenue/67th Avenue. Generally the predicted maximum one-hour concentrations for the existing configuration were between 2.0 ppm and 4.0 ppm; maximum predicted eight-hour concentrations were between 1.0 and 3.0 ppm. A listing of the maximum predicted one-hour and eight-hour concentrations for all years and configurations and their locations are provided in Appendix D. None of the predicted concentrations exceed federal or state standards.

Predicted maximum one-hour and eight-hour concentrations for buildout in 2030 generally were similar to those values obtained for the existing configuration and for the No Build Alternative. None of the predicted concentrations exceeded federal or state standards. Short-term impacts on ambient levels of CO might occur during construction due to the interruption of normal traffic flow.

Particulate Matter (PM₁₀)

Alternatives 1 and 2 occur in both urban and rural areas consisting of residential, public, and commercial facilities, including mining operations within the riverbeds. Ambient concentrations of PM₁₀ have been measured in the vicinity of Bell and Dysart roads; PM₁₀ data collected at this location are below the NAAQS. Alternatives 1 and 2 would provide a high-capacity link between US 60 and SR 303L and would reduce travel time and congestion on the arterial streets in the area. Although traffic volumes are expected to increase on the roadway, the net effect is expected to reduce the regional effect of congestion on the arterial streets. It is unlikely that Alternatives 1 or 2 would cause or contribute to an exceedance of the PM₁₀ standards.

Other Criteria Pollutants

Data from the Maricopa County Air Quality Department indicate that none of the remaining pollutants (SO₂, nitrogen oxides, lead, or PM_{2.5}) exceed the NAAQS in Maricopa County. These pollutants are not expected to exceed the NAAQS in the study area as a result of Alternatives 1 or 2.

Mobile Source Air Toxics

For Alternatives 1 and 2, the amount of MSATs emitted would be proportional to the VMT. The VMT estimated for Alternatives 1 and 2 is slightly higher than that for the No Build Alternative, because the additional capacity would increase the efficiency of the roadway and potentially attract rerouted trips from elsewhere in the regional transportation network. However, any such attraction would be small, since no viable alternative routes exist. This increase in VMT would lead to higher MSAT emissions for Alternatives 1 and 2 along the highway corridor. The emissions increase would be offset somewhat by lower MSAT emission rates due to increased speeds; according to the EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases would offset VMT-related emissions increases cannot be projected reliably due to the inherent deficiencies of technical models.

Emissions likely would be lower than present levels in the design year because of the EPA's national control programs, which are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions might differ from these national projections due to variations in emissions caused by changes in the mix and turnover of vehicles used by local trucking fleets, VMT growth rates, and local control measures. VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of Alternatives 1 and 2 would have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, there might be localized areas where ambient concentrations of MSATs could be higher under Alternatives 1 and 2 than under the No Build Alternative. The localized increases in MSAT concentrations likely would be most pronounced along the expanded roadway sections. However, as discussed above, the magnitude and the duration of these potential increases compared to the No Build Alternative cannot be quantified accurately due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions may rise, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs would be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover bringing into use newer vehicles with lower emissions, would cause substantial reductions over time that, in almost all cases, would cause regionwide MSAT levels to be significantly lower than today. Construction activity might generate a temporary increase in MSAT emissions.

Analysis of Alternative 3

Alternative 3 is expected to have the same effects on air quality as Alternatives 1 and 2. Ambient concentrations are not expected to exceed either the federal or state standards. Short-term impacts on ambient levels of CO might occur during construction due to the interruption of normal traffic flow. Construction activity might generate a temporary increase in MSAT emissions.

Analysis of the No Build Alternative

Under the No Build Alternative, maximum predicted one-hour and eight-hour concentrations of CO generally were similar to those obtained for the configuration of 2006. This might be due to the offset in the increase in traffic volume projected for 2030 by the reduction in the emission factors for 2030. The predicted one-hour and eight-hour concentrations do not exceed the federal and state standards.

Summary of Findings

The long-term effects associated with Alternatives 1, 2 and 3 are not expected to cause or contribute to an exceedance of air quality standards. Results of the microscale modeling indicate that effects on ambient one-hour average concentrations of CO are predicted generally to be less than 2 ppm. Effects on the remaining criteria pollutants are also expected to be low. Short-term impacts on ambient levels of CO might occur during construction due to the interruption of normal traffic flow.

4.9.3 Mitigation

Effects on air quality would be minimized under all three build alternatives by implementing the following mitigation measures:

- According to the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction* (2008 edition), Section 104, "Scope of Work," Subsection 08, "Prevention of Air and Noise Pollution," "[t]he Contractor shall control, reduce, remove or prevent air pollution in all its forms, including air contaminants, in the performance of the Contractor's work." The Contractor will comply with all air pollution ordinances, regulations, orders, etc., during construction. All dust-producing surfaces will be watered or otherwise stabilized to reduce short-term impacts associated with an increase in particulate matter attributable to construction activity.
- To minimize emissions from idling and slow-moving traffic in the construction zones, traffic control would be in accordance with the most current *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the Federal Highway

Administration, including any revisions or additions, and/or associated provisions in the project plans, as determined by the Maricopa County Department of Transportation's Traffic Design Section during design.

- The Maricopa County Department of Transportation's Contractor would comply with all air pollution ordinances, regulations, orders, etc., during construction (including *Maricopa County Air Quality Rule 310 – Fugitive Dust Sources* and any required air quality permits).
- The Maricopa County Department of Transportation's Contractor would stabilize (e.g., water) all dust-producing surfaces to reduce short-term effects associated with an increase in particulate matter attributable to construction activity.
- The Maricopa County Department of Transportation's Contractor would cover dump trucks transporting materials that might become airborne during transit. After dumping of such materials, the Contractor would either cover the truck bed or take measures to remove all residues that might become airborne (MCDOT Supplement to MAG Specifications Section 107.6.3).
- The Maricopa County Department of Transportation's Contractor would minimize offsite tracking of sediments by brushing or blowing off construction vehicles, or any other method deemed appropriate by the Contractor, before those vehicles exit the construction site (MCDOT Supplement to MAG Specifications Section 107.6.3).
- According to the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction* (2008 edition), Section 104, "Scope of Work," Subsection 08, "Prevention of Air and Noise Pollution," "[t]he Contractor shall control, reduce, remove or prevent air pollution in all its forms, including air contaminants, in the performance of the Contractor's work." The Contractor will comply with all air pollution ordinances, regulations, orders, etc., during construction. All dust-producing surfaces will be watered or otherwise stabilized to reduce short-term impacts associated with an increase in particulate matter attributable to construction activity.

4.10 PRIME AND UNIQUE FARMLANDS

4.10.1 Affected Environment

The Federal Farmland Protection Policy Act (FPPA) of 1981 requires federal agencies to consider the adverse effects their projects may have on the preservation of farmland. Soil types were mapped within the estimated right-of-way acquisition areas for each build alternative to identify farmland soils. Two types of farmland potentially subject to FPPA requirements occur in the project area, prime farmland and farmland of unique importance.

Prime farmland is defined as:

“...land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses” (CEQ 2005).

Farmland of unique importance is defined as:

“...land other than prime farmland that is used for the production of specific high-value food and fiber crops...such as, citrus, tree nuts, olives, cranberries, fruits, and vegetables” (CEQ 2005).

Farmland occurs throughout the study area between US 60 and Sarival Avenue. The largest contiguous area of farmland is located generally west of Dysart Road and on the north side of the existing Northern Avenue. However, urban and built-up areas and areas planned and zoned for residential, commercial, and industrial use are not considered primary farmlands under the FPPA. Local land use and zoning data from Maricopa County, City of Glendale, City of Peoria, and City of El Mirage were used to identify areas with prime farmland soils that are currently used or planned for non-farming purposes.

4.10.2 Environmental Consequences

Analysis of Alternatives 1, 2, and 3

Approximately 131 acres of farmland would be acquired to accommodate Alternatives 1 and 2. Approximately 153 acres of farmland would be acquired to accommodate Alternative 3. Effects on prime and unique farmlands would be the same for all three build alternatives within western and eastern portions of the project area.

The largest contiguous area of farmland is located along the western portion of the project area, which would require the taking of approximately 111 acres of farmland. This includes farmland of unique importance and some classified by the NRCS as having the potential to be prime farmland when irrigated (NRCS 2007).

Along the eastern portion of the study area, farmland occurs sporadically from 91st Avenue to 75th Avenue. Approximately 13 acres of farmland would be acquired to accommodate the corridor, all of which are considered prime farmland if irrigated (NRCS 2007).

Along the central portion of Alternatives 1 and 2, there is the least amount of farmland, requiring the taking of approximately 7 acres. Construction of the central portion of Alternative 3 would require the taking of approximately 29 acres of farmland classified by the NRCS as prime farmland when irrigated (NRCS 2007).

Analysis of the No Build Alternative

Future and current development of the area is expected to continue, including the conversion of farmland to residential and commercial uses.

Summary of Findings

NRCS is the coordinating agency for the FPPA. The NRCS uses a land evaluation and site assessment system to establish a farmland conversion impact rating score on proposed sites of federally funded projects. This score is used as an indicator for potential adverse impacts to farmland on sites that exceed the recommended allowable level.

An assessment of the project area was completed on form NRCS-CPA-106 for all three build alternatives of the Northern Parkway project. A coordination meeting was held with the NRCS Environmental Coordinator on September 9, 2008 and the assessment was discussed and submitted at that time. The discussion concluded that the majority of the farmland present in the central and eastern portions of the project area have already been converted to urban use or is planned for urban uses in the future. The potential for impact of prime and unique farmland is greatest in the western portion of the project area.

Project resultant loss of farmland under Alternatives 1 and 2 would be 131 acres. Farmland acreage lost under Alternative 3 would total 153 acres or approximately 22 acres greater than that lost under Alternatives 1 and 2. Some of the farmland affected would be classified as prime farmland when it is irrigated.

Farmland of statewide or local importance includes any other farmland deemed as such by the appropriate state or local government. There is no farmland of statewide or local importance within the study area.

4.10.3 Mitigation

Coordination completed with NRCS Arizona concluded that mitigation would not be required, in accordance with the findings of the NRCS-CPA-106 Farmland Conversion Impact Rating for Corridor Type Projects.

Provisions are included to maintain current and future farming operations, if desired by the property owner. In coordination with the property owners, existing irrigation ditches would be relocated, pipes installed to convey irrigation water under the parkway, and farm access roads would be constructed, in accordance with proper coordination procedures.

4.11 WATER RESOURCES

The following sections discuss surface water, groundwater, and floodplains as well as the permits necessary within the study area for Alternatives 1, 2, and 3. Refer to Appendix E for additional information regarding planned drainage improvements within the study area that may affect this project and regional channelization actions planned by FCDMC.

4.11.1 Affected Environment

Surface Water Hydrology

There are two main watersheds bisecting the study area: the Agua Fria River and New River watersheds. The principal drainage is the main channel of the Agua Fria River, located approximately at Northern Avenue between El Mirage Road and 115th Avenue. The secondary drainage is the improved channel of New River, located approximately at Northern Avenue and 103rd Avenue. Both drain north to south within the study area.

The local reach of the New River watershed is urban in character. Tributary channels have been improved to route surface water runoff to local storm sewers, improved channels, and engineered retention basins. Local surface water is moved to the New River channel, which is tributary to the Agua Fria River approximately 2 miles south of the study area.

The Agua Fria River is less urban than the New River in character, principally draining agricultural lands to the north and west of the study area. The Agua Fria River is the primary outfall for all runoff to the east of the White Tank Mountains. This area includes less dense urban development characterized by smaller-capacity drainage systems and improved channels. These local systems are tributary to the main channel of the Agua Fria River. The Agua Fria River is in turn tributary to the Gila River, approximately 8 to 10 miles downgradient of the study area, in western Phoenix.

The New River and Agua Fria River channels are ephemeral, carrying water only during peak rainfall/runoff events. Northern Avenue crosses the streambeds in two distinct shallow crossings, with a median rise to grade. Northern Avenue is closed to traffic whenever the channels are flowing over a base rate. Both east and west riverbanks are stabilized with soil cement, with the stabilized eastern bank protecting a large dike. This dike diverts surface water around the City of Glendale Municipal Landfill, located north of the Glendale Airport just east of the Agua Fria River. Additional information on surface water hydrology is located in Appendix E.

Groundwater Hydrology

Groundwater is defined as water stored beneath the ground surface that can be collected by wells, tunnels, or drainage galleries or that flows to the surface by seeps and springs. An aquifer

is an underground formation of permeable rock or loose material that can produce useful quantities of water when tapped by a well. Groundwater is held within the tiny pores of the surrounding aquifer material. All groundwater in the study area is under the jurisdictional management of the Arizona Department of Water Resources, Phoenix Active Management Area. The Active Management Area program was designed to preserve groundwater resources and promote long-term water supply planning for the Phoenix metropolitan area. The primary aquifer in this area is unconfined alluvium composed of Quaternary-aged basin-fill deposits. The depth to groundwater in the new facility area ranges from 350 feet below ground surface in the western area to 300 feet below ground surface on the eastern portion (Arizona Department of Water Resources 2004).

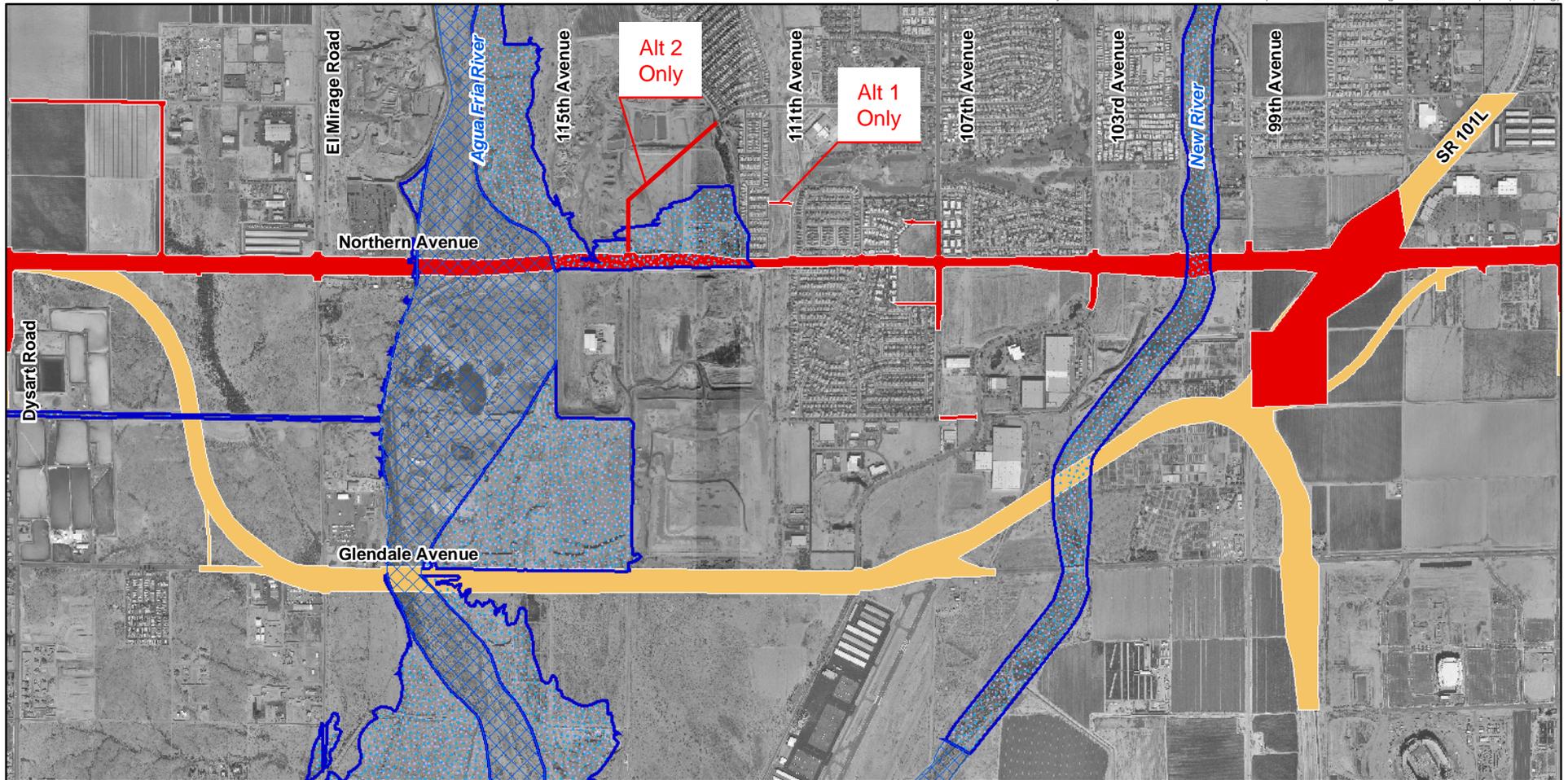
The western portion of the study area is within a managed groundwater subarea commonly referred to as the Luke AFB cone of depression. This is an area characterized by an extensive depression in the local water table, due to localized water mining. The cone of depression results from large amounts of groundwater withdrawals for military base and agriculture uses.

Floodplains

Floodplains are areas of alluvium-covered, relatively level land along the banks of a stream, river, or wash that becomes covered with water when the flow exceeds the capacity of the containing channel (Geologic Glossary 2006). Executive Order 11988 regulates floodplain protection and requires that effects on floodplains be identified, studied, and assessed to minimize the risk of flood loss, to minimize effects of flooding, and to preserve the beneficial values of the floodplains.

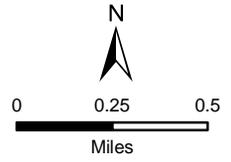
Both the Agua Fria River and New River drainages include tracts of regulated floodplain, per the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panels revised on September 30, 2005. The FIRM maps for the study area label areas of flooding as Zone A, which are areas within the 100-year floodplain, as shown in Figure 4-11. The areas of notable flooding that are denoted on the FEMA FIRM maps include the following:

- Reems Road from Northern Avenue to Olive Avenue
- The west side of BNSF railroad spur, from Northern Avenue to Olive Avenue
- Agua Fria River at both shallow crossings
- The sand-and-gravel pit to the north of Northern Avenue from the Agua Fria River's east bank to 113th Avenue



Legend

- Alternatives 1 and 2
- Alternative 3
- FEMA Floodplains**
- 100-Year Floodplain
- Floodway



**100-Year Floodplain
Central Portions**

Northern Parkway

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C

Source:
 Floodplain Data - FEMA 2005
 Imagery - Maricopa County Department of Transportation 2006

Figure 4-11

Alternative 1 and 2 were evaluated for potential impacts on regulated floodplains, upstream and downstream of the alternatives, in accordance with 23 CFR 650(a). This regulation calls for the assessment of federally funded highway projects in terms of effects on flood risk. Under this code, federal highway projects must avoid hazardous or incompatible use and development of floodplains, avoid longitudinal or substantial floodplain encroachment, minimize negative effects on base flood elevations, restore and preserve natural and beneficial floodplain values, and be consistent with FEMA, state, and local government standards for administration of the National Flood Insurance program.

Alternatives 1, 2, and 3 would be designed to minimize floodplain encroachments and ensure that the flood-carrying capacity of the drainages crossing the study area would not be impaired. Construction of Alternatives 1, 2, and 3 would not constitute a hazardous or incompatible use of floodplains, would not result in longitudinal or substantial floodplain encroachment, would not result in greater than a 1-foot rise in base flood elevations, would not impact natural or beneficial floodplain values, and would be consistent with FEMA, ADOT, and FCDMC standards regarding highway construction in floodplains.

Permits

Construction activities for Alternatives 1, 2, and 3 would occur within potential jurisdictional waters of the United States; therefore, the project needs to comply with the Clean Water Act. Section 404 of the Clean Water Act (33 U.S.C. 1344). Section 404 prohibits the discharge of dredged or fill material into waters of the United States without a permit from the United States Army Corps of Engineers (USACE).

Section 10 of the Rivers and Harbors Act of 1899 prohibits the obstruction or alteration of navigable waters of the United States without a permit from the USACE. Navigable waters of the United States are defined as waters that have been used in the past, are now used, or are susceptible to use as a means to transport interstate or foreign commerce up to the head of navigation. Section 10 and/or Section 404 permits are required for construction activities in these waters. In the arid southwest, the only navigable water is the Colorado River. Therefore, ephemeral washes upstream that connect to the Colorado River are jurisdictional waters of the United States. The Agua Fria River and New River are jurisdictional waters of the United States because they are tributaries to the Gila River, which is a tributary to the Colorado River (navigable water). In addition, the washes appear as named drainages on the USGS 7.5-minute quadrangle map.

Section 401 of the Clean Water Act requires that project sponsors demonstrate that proposed construction activities would not cause or contribute to the violation of state water quality standards. ADEQ would issue the Section 401 permit certifications because the project is within the State of Arizona's jurisdiction.

All the alternatives would cross over the Agua Fria River and New River and would require the installation of bridge and drainage structures that would impact waters of the United States as seen in Figure 4-12. Wetland conditions occur within the Agua Fria River approximately 1,170 feet south of the right-of-way for Alternatives 1 and 2, and approximately 440 feet north of the right-of-way for the central portion of the Alternative 3. Dense riparian conditions occur within the Agua Fria River approximately 900 feet south of the right-of-way for the central portion of Alternative 3. Because more than 1 acre would be disturbed during construction, an Arizona Pollutant Discharge Elimination System/National Pollution Discharge Elimination System permit is required. A Notice of Intent and Notice of Termination would be submitted to the ADEQ.

Alternatives 1 and 2 would require new extensions and/or replacements of existing culverts that convey stormwater under Northern Avenue. Because 1 acre or more of land would be disturbed, a Stormwater Pollution Prevention Plan is required. The ADOT Roadside Development Section would maintain responsibility for preparing and implementing the Stormwater Pollution Prevention Plan.

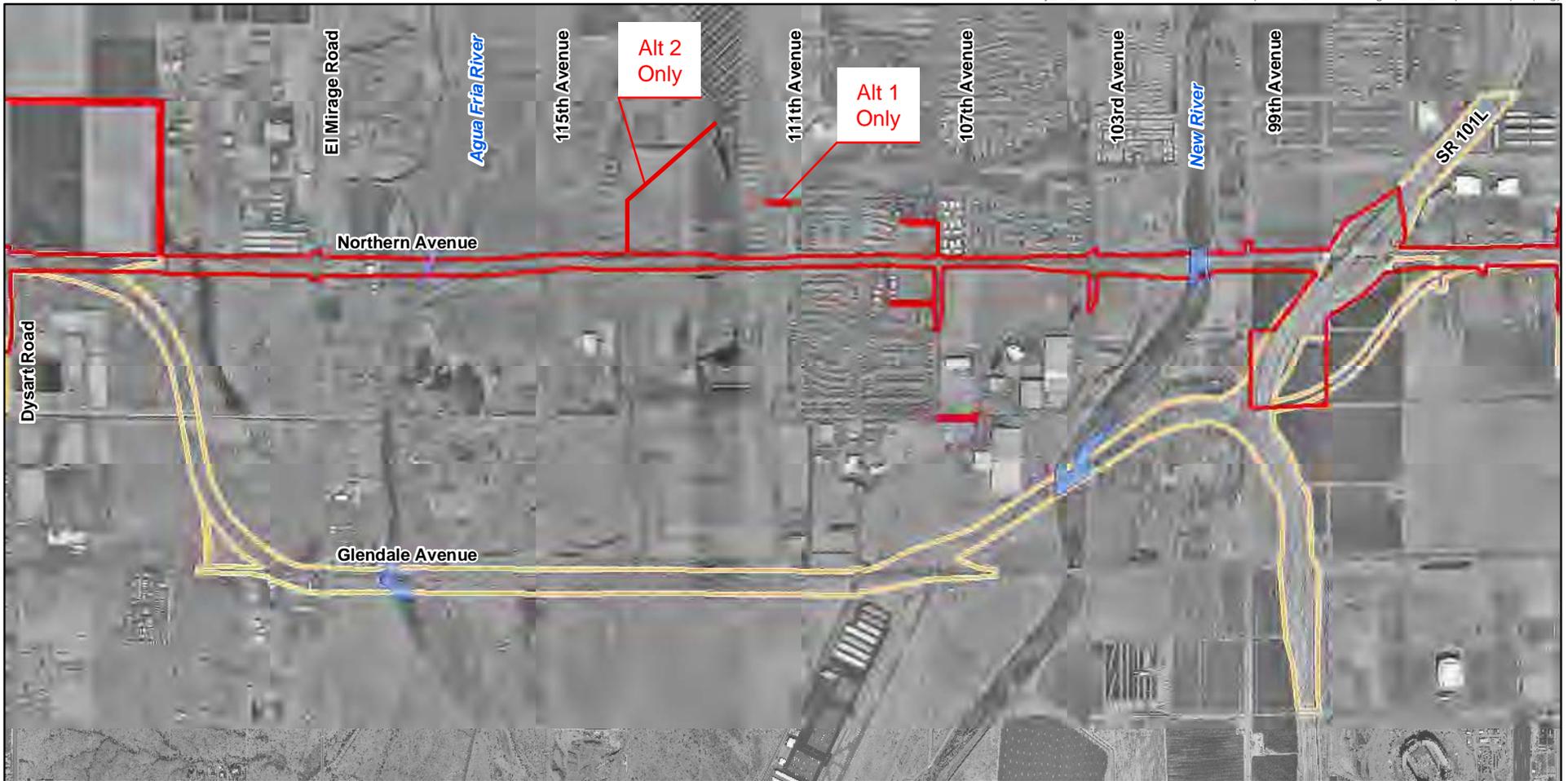
4.11.2 Environmental Consequences

Analysis of Alternatives 1 and 2

Surface Water

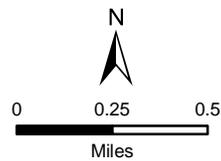
Runoff from urbanized areas to the east of New River is intercepted intermittently along Northern Avenue. The various developments in this area were constructed with varying drainage design standards.

Subdivisions and commercial development built since 1985 generally provide onsite retention that does not reach Northern Avenue. These drainage systems are designed to county specifications and standards and would not be modified during this action.



Legend

- Alternatives 1 and 2
- Alternative 3
- Proposed Jurisdictional Waters



**Proposed Jurisdictional Waters
 Central Portions
 Northern Parkway**

Federal Project No. STP-MMA-0(034)B
 TRACS No. 0000 MA MMA SS593 01C

Source:
 Imagery - Maricopa County Department of Transportation 2006

Figure 4-12

Older subdivisions and rural developments generally discharge the runoff directly onto Northern Avenue. There are low points along Northern Avenue that form areas of flooding during most storms. These drainage systems might not meet current county standards and specifications. Upgrade and improvement of influent drainage systems might be required to develop Northern Avenue to meet design specifications; however, upgrade of nonpublic facilities and those that are not project-related is outside the project scope and is not considered herein.

Along the western portion of the study area, there would be five new drainage channels, one box culvert extension, two new box culverts, and two retention/detention basins. All improvements would impact existing surface water drainage patterns. There would be an increase in stormwater runoff from additional impervious roadway surfaces. These waters would be collected and conveyed by storm drain systems for discharge into the nearest natural wash or interceptor channel.

Along the central portion of the study area, there would be four new drainage channels, four new box culverts, one new pump station, two retention/detention basins, and three new storm drains. All improvements would impact the existing surface water drainage patterns. The stormwater runoff conditions described for the western portion would be the same for the central portion.

Along the eastern portion of the study area, the stormwater runoff conditions would be the same as those described for the western and central portions.

Groundwater

The effects on groundwater can be described as short-term related effects and long-term unavoidable effects.

Along the western portion of the study area, construction might impact groundwater quality in the short term by increasing runoff and increasing pollutant loading from earthmoving construction activities and exposure of construction materials. Due to the considerable depth of groundwater in the sub-basin, there is little potential for direct surface water recharge of the saturated aquifer.

The long-term effects on groundwater are difficult to quantify; however, in aggregate they are expected to be minimal. There remains a concern that natural recharge of diffuse surface water continues to decrease as urbanization extends to the upper reaches of the Agua Fria River and New River watersheds; however, this is a regional development issue that is peripheral to the project, and it should not be considered an immediate project effect.

Along the central and eastern portions of the study area, effects on groundwater would be the same as those described for the western portion.

Floodplains

Along the western portion of the study area, floodplain effects would be minimal. Under the interim condition of widening the existing Northern Avenue crossing of the Agua Fria River, a low-flow channel would continue to exist, if needed based on project implementation phasing. This road section might need to be closed under high flow or flooding conditions, as it is today. When the future river channelization project is completed (by others), the new facility bridge, structures, and related engineered improvements would be built to accepted engineered standards, meeting criteria for the 100-year and 500-year design events for floods.

Along the central portion of the study area, there would be a proposed 800-foot bridge across the Agua Fria River, which would affect the existing river crossings. The Agua Fria River crossing would remain an at-grade crossing for interim phases of the project. The preliminary hydraulic analyses of the river crossing determined that an 800-foot-long bridge, with channelization of the river 1 mile downstream and 1 mile upstream, was recommended to accommodate the 500-year flow.

Between the interchanges, the roadway would return to existing grade. There would be four lanes in each direction, with no vertical curb west of 112th Avenue. Any additional catch basins, median drains, retention basins, and minor roadside ditches or channels would be constructed along with the final roadway construction.

Channelization actions by the FCDMC are not included as part of this new facility. The downstream reach of the channel between Northern Avenue and Glendale Avenue must be completed prior to, or concurrent with, bridge construction for this project.

Improvement of the Agua Fria River channel must be completed prior to construction of the new bridge in Alternatives 1 and 2. Channel reconstruction under the new bridge and downstream to Glendale Avenue must be completed before or concurrent with construction of the new bridge crossing. Upstream channel improvements between Northern Avenue and Peoria Avenue would improve the upstream hydraulics, but they are not as important as downstream channel improvements.

Alternatives 1 and 2 include a replacement bridge across the New River, which would impact the existing river crossings. A new bridge would be a six-span bridge that would cross both New River and the eastbound Northern Avenue bridges. A 1,125-foot-long bridge would be required to cross New River and the eastbound Northern Avenue ramp that crosses under the elevated

portion of the new facility. This six-lane bridge would be located approximately 45 feet south of, and downstream from, the existing bridge. The bridge width would vary from 129.2 feet at the west abutment to 100.8 feet for the eastern six spans.

Additions to the New River bridge would require construction of two new piers within the channel. These piers would be aligned with the existing bridge piers. The existing Northern Avenue Bridge over New River would be left in place and would serve as the new westbound Northern Avenue lanes. Five-foot-diameter bridge piers were used in the hydraulic model. The ratios of side slopes for the abutment are assumed to be 2:1. The bridge's combined superstructure depth and slab thickness are assumed to be 7.5 feet.

The new eastbound Northern Avenue roadway would require a separate 425-foot-long, three-span bridge. The new 49.7-foot-wide, three-lane bridge would be located approximately 85 feet south of, and downstream from, the aforementioned bridge in Alternatives 1 and 2. The new eastbound bridge would be constructed at approximately the same level as the existing Northern Avenue Bridge.

Bridge pier columns with a 5-foot diameter would be used; the ratio of abutment side slopes has been assumed to be 2:1. The bridge's combined superstructure depth and slab thickness are assumed to be exactly 7 feet. The final pier locations, span lengths, abutment locations, and bank lining must be addressed in detail during final design.

The New River soil cement bank protection and the river channel would be essentially unchanged as a result of the new facility construction. The 100-year water surface would rise slightly due to the additional piers to be constructed in New River. These proposed 100-year and 500-year water surfaces are completely contained within the existing New River channel.

No conceptual modifications are anticipated for the New River channel configuration or bank protection. No new grade-control structures are anticipated for the New River channel in this reach. The final pier locations, span lengths, abutment locations, and possible bank lining reconstruction must be addressed in detail during final design.

Along the eastern portion of the study area, effects on floodplains would be the same as those described for the western and central portions.

Permits

ADEQ would determine if conditional water quality certification for the site would be issued for the project. More than 1 acre of land would be disturbed; therefore, an Arizona Pollutant Discharge Elimination System permit would need to be obtained from ADEQ.

Along the western portion of the study area, Clean Water Act Section 404 permits would not be necessary because there are no waters of the United States that occur in that location.

Along the central portion of the study area, there would be coordination with the USACE so that the appropriate Section 404 permit is prepared in accordance with the Clean Water Act and a water quality certification permit is obtained from ADEQ. The Contractor would have to comply with the terms and conditions in the permit for any effects on jurisdictional waters of the United States.

Along the eastern portion of the study area, Clean Water Act Section 404 permits would not be necessary because no waters of the United States occur.

Analysis of Alternative 3

Surface Water

Effects on surface water from drainage improvements would be the same as those identified for Alternatives 1 and 2 for all portions within the study area.

Groundwater

Effects on groundwater would be the same as those identified for Alternatives 1 and 2 for all portions within the study area.

Floodplains

Effects on the floodplains would be similar to those identified for Alternatives 1 and 2 except the location of the river crossings would be different. Bridges exist at both the Agua Fria River and New River at Glendale Avenue. Northern Parkway would require two new bridges at the Agua Fria River and one bridge at the New River which crosses the river at an angle.

Permits

Section 404 permits are not applicable for the western and eastern portions of the study area. Requirements for Section 404 permits in accordance with the Clean Water Act would apply to the central portion of Alternative 3 where the jurisdictional waters of the Agua Fria River and New River cross the study area.

Analysis of the No Build Alternative

Surface Water

If the No Build Alternative is selected, there would be no drainage improvements or improved bridge crossings over the Agua Fria River and New River at Northern Avenue. Continued

development of land and arterials, however, would occur and have an effect on drainage. Federal and state regulatory requirements would continue to apply to any development proposals.

Groundwater

Under the No Build Alternative, there would be no effects on groundwater because there would be no increased runoff from construction activities.

Floodplains

Under the No Build Alternative, no alterations of the existing floodplains would occur. The FCDMC has adopted a master plan for the Agua Fria River that assumes the river would be channelized in the future, after sand-and-gravel mining operations cease. The channelization scheme would dramatically alter the current floodplain, which would require modification to Northern Avenue.

Permits

Under the No Build Alternative, there would be no effects on jurisdictional waters of the United States protected by the Clean Water Act Section 404.

Under the No Build Alternative, effects from land disturbance and associated sedimentation discharge likely would occur over time from incremental roadway improvements to Northern Avenue and other area arterials and local streets. The responsible parties would be required to assess the need for water quality permits under federal and state guidelines.

Summary of Findings

Alternatives 1, 2, and 3 would have the same types of impacts on water resources. Clean Water Act permit requirements could include a lengthier process for Alternative 3 because of existing riparian conditions, and larger acreage of proposed jurisdictional waters at the Agua Fria River and New River that would be impacted from construction of new bridges. The No Build Alternative could result in higher impacts on water resources from intermittent, smaller-scale land development projects without proper permitting and drainage features that would likely occur along Alternatives 1, 2, and 3.

The drainage improvements for Alternatives 1, 2, and 3 (e.g., channels, catch basins, storm drains) would provide for higher capacities of surface water flow without adverse impacts on adjacent land uses. Drainage features would ensure that water runoff from storm events would avoid vehicles traveling along Alternatives 1, 2, and 3.

Groundwater would not be impacted by Alternatives 1, 2, and 3 because the groundwater is at a depth that would be costly to access for construction-related activities. Permits required for project construction would avoid impacts on groundwater from runoff infiltration.

No changes to existing floodplains would occur from Alternatives 1, 2, and 3.

Permits in accordance with the Clean Water Act Sections 301, 401, 402, and 404 are required as protection measures for surface water and groundwater for all alternatives.

4.11.3 Mitigation

Alternatives

Effects on surface water, groundwater, and floodplains would be minimized under all build alternatives by implementing the following mitigation measures:

- The Maricopa County Department of Transportation would apply for and receive a Section 401/404 permit from the U.S. Army Corps of Engineers.
- The Maricopa County Department of Transportation would ensure that detention basins are designed and installed to mitigate any increases in peak runoff rates.
- The Contractor would follow all requirements issued in the U.S. Army Corps of Engineers' Section 404 and Section 401 permits.
- The Maricopa County Department of Transportation's Contractor would take precautions to prevent materials from being discharged into washes and channels to prevent construction materials from entering the Agua Fria River and New River² in accordance with necessary permits under the Clean Water Act.
- The Maricopa County Department of Transportation would consult with the Federal Emergency Management Agency and the U.S. Army Corps of Engineers³ to identify and mitigate potential effects on floodplains or waters of the United States.
- The Maricopa County Department of Transportation would design the new facility to minimize floodplain encroachments and ensure that the flood-carrying capacity of drainages that cross the study area would not be impaired.

² These precautions would be in accordance with the Water Quality Standards in Title 18, Chapter 11, of the Arizona Administrative Code as administered by the Arizona Department of Environmental Quality and Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction, Section 104.09 and Section 107.11, "Protection and Restoration of Property and Landscape" (2008 edition).

³ It is anticipated that this project would be covered by a series of nationwide Section 404 permits because it is likely that the permanent impacts from bridge construction would be less than or equal to 0.5 acre.

- During final design, the Maricopa County Department of Transportation would coordinate with the U.S. Army Corps of Engineers to complete the jurisdictional delineation to identify permit requirements formally under Sections 401 and 404 of the Clean Water Act and mitigate potential impacts from a new facility.
- The Contractor would follow all requirements issued in the U.S. Army Corps of Engineers Section 404 and Section 401 permits.
- This project is subject to the Arizona Pollutant Discharge Elimination System. The Maricopa County Department of Transportation would direct its contractor to comply with general permit requirements for construction sites under the Arizona Department of Environmental Quality, the Arizona Pollutant Discharge Elimination System Construction General Permit. In addition, the Maricopa County Department of Transportation and the Contractor would submit the Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality.
- Because more than 1 acre would be disturbed during construction, compliance with the Arizona Pollutant Discharge Elimination System requirements administered by the Arizona Department of Environmental Quality is necessary. The Contractor shall take all necessary measures to assure compliance of employees and subcontractors with the Arizona Pollutant Discharge Elimination System Construction General Permit for Arizona as well as other applicable Federal, State, and local laws, ordinances, statutes, rules, and regulations pertaining to stormwater discharge and air, groundwater, and surface water quality. As the permittee, the Contractor is responsible for preparing in a manner acceptable to the Arizona Department of Environmental Quality and the Environmental Protection Agency all documents required by regulation, which shall include but not necessarily be limited to the following:
 - Notice of Intent (NOI)
 - Stormwater Pollution Prevention Plan (SWPPP)
 - Notice of Termination (NOT)

Preliminary copies of the Notice of Intent and the Stormwater Pollution Prevention Plan shall be submitted to Maricopa County Department of Transportation during the pre-construction conference and shall be subject to review by the Maricopa County Department of Transportation prior to implementation. Copies will be provided also to the Cities of Glendale, Peoria, and El Mirage.

The Contractor shall ensure the completed and duly signed Notice of Intent form(s) are submitted in a timely manner to prevent a delay to project construction.

The Arizona Pollutant Discharge Elimination System form shall be submitted to the Arizona Department of Environmental Quality Phoenix, Arizona office by certified mail or hand delivered to the address below:

Stormwater Program-Water Permits Section/Notice of Intent
Arizona Department of Environmental Quality
1110 West Washington, 5415B-3
Phoenix, AZ 85007

- The Maricopa County Department of Transportation would ensure that “[t]he Contractor shall take sufficient precautions, considering various conditions, to prevent pollution to streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, fresh Portland cement, raw sewage, muddy water, chemicals, or other harmful materials. None of these materials shall be discharged into any channels leading to such streams, lakes, or reservoirs.”
- The Maricopa County Department of Transportation’s Contractor would ensure that no staging work during bridge construction over the New River would occur in the floodplain south of the proposed right-of-way.
- The Maricopa County Department of Transportation would ensure compliance with the Maricopa County Department of Transportation Supplement to the Maricopa Association of Governments’ Uniform Standard Specifications and Details for Public Works Construction, January 2008, regarding Section 107.2.1 Arizona Pollutant Discharge Elimination System Construction General Permit Requirements.

Under Alternative 3, mitigation measures that require permits could involve a lengthier permit process with the USACE if there are impacts on the wetland area within the New River that currently exists approximately 900 feet north of the central portion’s right-of-way.

4.12 BIOLOGICAL RESOURCES

4.12.1 Affected Environment

The study area is located along the western margin of the Phoenix metropolitan area within the Arizona Upland subdivision of the Sonoran Desert. It is a desert of much lower elevation than the Mojave Desert to the north, and much of the land lies below 1,000 feet in elevation. The geography consists mostly of broad, flat valleys with widely scattered mountain ranges of principally barren rock. Creosotebush (*Larrea tridentata*) and triangle-leaf bursage (*Ambrosia deltoidea*) are the dominant plant species found within the region. Other vegetation includes cacti such as the saguaro (*Carnegiea gigantea*) and cholla (*Cylindropuntia* spp.), as well as trees such as paloverde (*Parkinsonia* spp.) and velvet mesquite (*Prosopis velutina*).

Vegetation

Agricultural, industrial, and residential development has removed most of the native vegetation within the study area; where present, it is generally found as landscaping.

Along the western portion of the study area, agricultural land is in various states of use, including fallow, plowed, and cultivated fields. Irrigation canals and drainage ditches are also present within this area. Where vegetation can be found within the central portion of Alternatives 1 and 2 and the eastern portion of the study area, it consists primarily of nonnative annual grasses and scattered patches of landscaping.

Along the central portion of Alternatives 1 and 2, the only remaining natural vegetation consists of Sonoran desertscrub and riparian vegetation that is found along the New and Agua Fria rivers and an unnamed ephemeral wash.

Along the central portion of Alternative 3, vegetation types are similar to those found in the central portion of Alternatives 1 and 2; however, the riparian area within the New River channel contains greater vegetative structural diversity and density. Additionally, the amount of Sonoran desertscrub is proportionately higher in this portion than that of Alternatives 1 and 2.

The eastern portion of the study area, is generally bordered by mixed industrial/urban land uses.

Invasive Species

Based on Executive Order 13112 on invasive species, dated February 3, 1999, all projects will, "...subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: i) prevent the introduction of invasive species; ii) detect and respond rapidly to, and control, populations of such species in a cost-effective and environmentally sound manner; iii) monitor invasive species populations accurately and reliably...[and] iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded."

Within the project area, invasive species likely to be present would include weeds typical of agricultural areas such as field bindweed (*Convolvulus arvensis*) and morning glory (*Ipomoea* spp.). In the New River channel, floating water hyacinth (*Eichornia crassipes*) and hydrilla (*Hydrilla verticillata*) could potentially be present.

Native Plants

The project limits were surveyed for the presence of native plants protected by the Arizona Department of Agriculture. One plant species listed under the Arizona's Native Plant Law,

velvet mesquite, occurs off Northern Avenue between Litchfield and Dysart roads. Velvet mesquite, blue paloverde (*Parkinsonia florida*), foothills paloverde (*P. microphylla*), and cholla are found off Northern Avenue between Dysart Road and 111th Avenue. Velvet mesquite is found off of Northern Avenue between the 101 Freeway and 93rd Avenue on the south side of the road. Velvet mesquite, blue paloverde, and foothills paloverde are found between Dysart Road and 91st Avenue.

General Wildlife

Along the western portion of the study area, the weedy edges of fields and irrigation canals, as well as poorly maintained fields within agricultural areas, compose the majority of wildlife habitats. Invertebrates associated with irrigation canals serve as an important food source for many species.

Along the central portion of Alternatives 1 and 2, there are several large areas of existing habitat and riparian habitats, as well as potential movement corridors for wildlife. While riparian habitats are found only along the unnamed wash and the New and Agua Fria rivers, it is likely that they provide essential habitat for species found throughout this area.

Along the central portion of Alternative 3, wildlife habitat types are generally the same as those previously described for the central portion of Alternatives 1 and 2; however, species associated with riparian and Sonoran desertscrub habitats likely would be more abundant due to the higher value and larger areas of potential habitat.

Along the eastern portion of the study area, the wildlife species likely to be found are characteristic of urbanized, disturbed habitats and typically include highly opportunistic and adaptable species. The high proportion of paved and compacted substrates, vehicles, and streets precludes the presence of most terrestrial reptiles.

Threatened and Endangered Species, Designated Critical Habitat, and Special Status Species

Two federally endangered and one state-listed species (Table 4-6) were identified as having the potential to occur in the study area. The southwestern willow flycatcher (*Empidonax trillii extimus*), the lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*), and the lowland leopard frog (*Rana yavapaiensis*) were evaluated in a biological evaluation. No designated or proposed critical habitat was identified as occurring in the study area.

Table 4-6
Special Status Wildlife Species with the Potential to Occur within the Study Area

Common Name	Scientific Name	Federal	State	State Rank
Lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuena</i>	LE	WSC	S2
Southwestern willow flycatcher	<i>Empidonax trailii extimus</i>	LE	WSC	S1
Lowland leopard frog	<i>Rana yavapaiensis</i>	SC	WSC	

SOURCE: Arizona Game and Fish Department 2007

NOTES:

LE	Listed Endangered	SC	Species of Concern
S1	Very Rare	WSC	Wildlife of Special Concern in Arizona
S2	Rare		

4.12.2 Environmental Consequences

Analysis of Alternatives 1 and 2

Along the western portion of the study area, surface disturbances from construction would result in the removal of approximately 186 acres of nonnative vegetation cover types. This includes approximately 111 acres of agricultural land and 75 acres of land where nonnative annual grasses and scattered patches of landscaping are present or in areas where vegetation is absent altogether.

Vegetation removal would affect some small mammal, reptile, and/or amphibian species with very limited home ranges and mobility. The effects would be moderate in the short term since most of these wildlife species would be common and widely distributed throughout the study area and the loss of some individuals as a result of habitat removal would have a negligible effect on populations of these species throughout the region.

Along the central portion of the study area, effects on vegetation and general wildlife habitat would be similar in nature to those described for the western portion. The scope of effects would be increased primarily due to the removal of approximately 38 acres of native vegetation types, and wildlife habitats which would be permanently lost to new pavement or structures. This includes approximately 34 acres of Sonoran desertscrub and 4 acres of riparian vegetation, shown in Table 4-7. An additional 137 acres of nonnative vegetation in disturbed and agricultural land, including 130 acres of disturbed areas and 7 acres of agricultural land, would be removed. The disturbance of 38 acres of native wildlife habitat would likely lead to low levels of impacts on various species of nongame songbirds, small mammals, and reptiles in the short term. These effects are not expected to adversely affect populations of these species because of their high reproductive potential and the availability of other suitable habitats within the study area and surrounding region.

**Table 4-7
Area (acres) of Land Cover Types Affected by Alternative**

Alternative	Land Cover Type				Total (acres)
	Sonoran Desertscrub	Disturbed	Riparian	Agriculture (average acres)	
<i>Alternatives 1 and 2</i>					
Western portion	–	75	–	111	186
Central portion	34	130	4	7	175
Eastern portion	–	103	–	13	116
Total	34	308	4	131	477
<i>Alternative 3</i>					
Western portion	–	75	–	112	187
Central portion	102	217	9	29	357
Eastern portion	–	102	–	13	115
Total	102	394	9	154	659
<i>No Build Alternative</i>					
Western portion	–	–	–	–	–
Central portion	–	–	–	–	–
Eastern portion	–	–	–	–	–
Total	0	0	0	0	0

Effects from construction in the central portion on special status plant and wildlife species and their habitats would be similar in nature and scope to those discussed in the preceding sections for vegetation communities and wildlife. However, these effects can be more severe for special status plant and wildlife species, if present, since the distribution and abundance of many of these species are limited in the Phoenix metropolitan area and surrounding region.

Potential effects from construction on the lesser long-nosed bat, southwestern willow flycatcher, and lowland leopard frog are discussed below.

Although potential habitat for the lesser long-nosed bat occurs within the study area, the abundance of suitable food plants such as saguaro and agave is low, providing little foraging opportunity for this species. Therefore, no potential direct and indirect effects on the lesser long-nosed bat from construction of the central portion are expected to occur.

The alignment would cross over potentially suitable habitat for the lowland leopard frog. The value of this habitat may be degraded or lost due to construction activities.

The alignment would also cross near areas of potential habitat for resting or migratory southwestern willow flycatchers. A search of the Arizona Game and Fish Department’s Heritage Database showed no records of southwestern willow flycatcher use of the project area; however, habitat evaluation of the area showed that vegetation was, or may become, potentially suitable habitat. No potential flycatcher habitat would be directly removed as it lies outside of the

proposed right-of-way. Therefore, as determined in the Draft biological evaluation, potential direct and indirect effects associated with the central portion are expected to have no effect on southwestern willow flycatcher.

The eastern portion of the study area would be located predominantly within developed/disturbed lands and would avoid all sensitive biological resources within the alignment. Eighty-nine percent (103 acres) of all surface disturbances would occur within developed/disturbed land, and the remaining 11 percent (13 acres) would be limited to agricultural land.

Analysis of Alternative 3

Effects on biological resources would be similar to those described for the western and eastern portions of Alternatives 1 and 2, except for the central portion.

The central portion of Alternative 3 would cross the New River which contains potentially suitable habitat for the lowland leopard frog. The alignment would also cross the New River between two areas of potential southwestern willow flycatcher habitat. These areas are approximately 0.25 mile from the alignment so potential direct and indirect effects associated with the central portion of Alternative 3 are expected to have no effect on the southwestern willow flycatcher.

Construction of the central portion would result in the direct disturbance of approximately 111 acres of natural vegetation communities, including approximately 102 acres of Sonoran desertscrub and 9 acres of riparian habitat, as shown in Table 4-7. The actual amount of riparian habitat lost is expected to be less, since bridges would be placed to span these areas. The only riparian habitat that would be permanently lost would be in those areas that are associated with construction of the piers for the new bridges. Impacts on threatened, endangered, and sensitive species would be the same as previously described for the central portion of Alternatives 1 and 2.

Analysis of the No Build Alternative

Future development of the area is expected to continue, and arterial roads likely would be extended or developed to support this growth, affecting native plants protected by Arizona's Native Plant Law. State regulatory requirements would continue to apply to any future development.

Areas that currently have vegetative cover would not be disturbed and would not become vulnerable to invasive species.

Impacts on biological resources would be expected to occur proportionately with the increase in the population of the Phoenix metropolitan area. Future development of the area is expected to

continue, and arterial roads likely would be extended or developed to support this growth. This development would fragment and lessen the acreage of wildlife habitats in the study area.

No threatened, endangered, proposed, or candidate species would be affected, and no special status species would be impacted as no suitable habitat exists for these species. Suitable habitat is not expected to become available, as future development of the area is expected to continue and arterial roads likely would be extended or developed to support this growth.

Summary of Findings

Table 4-7 presents a summary of disturbed areas by land cover type for each portion for each alternative.

Effects common to all three build alternatives would result in direct and indirect impacts on vegetation communities and wildlife habitats within the study area. Direct effects on vegetation communities and wildlife habitats would occur from the disturbance and removal of vegetation along the alignments and associated project components. While most of the vegetation removed would be ruderal, nonnative, or agricultural species, as well as landscape species, a very limited amount of native vegetation would be removed as well. Effects on native vegetation and wildlife habitats would occur mainly within the central portions of Alternatives 1, 2, and 3, as these portions contain the majority of native vegetation and wildlife habitats within the study area. Along the western and eastern portions of the study area, the majority of the vegetation and wildlife habitat to be disturbed is nonnative vegetation on agricultural and developed/disturbed land. Disturbance of vegetation cover types would be moderate in the short term because the native and nonnative vegetation types that would be disturbed are relatively common, have high frequencies of occurrence, and have wide distributions and because the extent of disturbance to these vegetation types would be expected to decrease with the onset of reclamation efforts on many of the disturbed areas.

Indirect effects would include the increased potential for the establishment and spread of noxious weeds, shifts in vegetation community and wildlife habitat composition, and loss of biodiversity. Under Alternatives 1, 2, and 3, effects on vegetation and wildlife habitats would include the removal of cover types and wildlife habitat, as well as the potential for establishment of invasive and noxious weeds.

The implementation of Alternatives 1, 2, and 3 would result in direct loss of wildlife habitat from surface disturbance associated with the construction of the new facility and associated components. The acreages of vegetation/land cover types and wildlife habitats disturbed for Alternatives 1 and 2 include 308 acres of developed/disturbed lands, 131 acres of agricultural

lands, 34 acres of Sonoran desertscrub lands, and 4 acres of riparian lands. Alternative 3 would disturb 394 acres of developed/disturbed lands, 154 acres of agricultural lands, 102 acres of Sonoran desertscrub lands, and 9 acres of riparian lands (see Table 4-7).

For each alternative no threatened, endangered, proposed, or candidate species would be affected, and no special status species would be impacted.

4.12.3 Mitigation

Effects on biological resources would be minimized under all three build alternatives by implementing the following mitigation measures:

- The Maricopa County Department of Transportation's Contractor would ensure that all disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.
- If protected native plants would be impacted by project activities, the Maricopa County Department of Transportation's Contractor would notify the Arizona Department of Agriculture at least 60 days prior to the start of construction so that the Arizona Department of Agriculture could determine the disposition of these plants.
- The Maricopa County Department of Transportation's Contractor would prevent the introduction of invasive species seed and would ensure that all construction equipment would be washed at the Contractor's storage facility prior to entering the construction site.
- To prevent the seeds of invasive species from leaving the site, the Maricopa County Department of Transportation's Contractor would inspect all construction equipment and remove all attached plant/vegetation debris prior to the equipment leaving the construction site.
- To lessen or avoid potential effects on wildlife in the study area, the Maricopa County Department of Transportation would ensure that removal or disturbance of vegetation would be minimized through project design as practicable.
- During final design, the Maricopa County Department of Transportation would coordinate with the Federal Highway Administration to determine if a "no effect" is still warranted or if there needs to be consultation with the U.S. Fish and Wildlife Service and obtain a list of threatened, endangered, proposed, and candidate species. The Arizona Game and Fish Department's Heritage Database Management System list of special status species would be reviewed by a qualified biologist to determine if any new species have been listed or any changes in listing status have occurred. The biological evaluation

would be updated to reflect any changes, if needed. The amended Biological Evaluation would be submitted to the Arizona Department of Transportation for review, approval, and coordination with the Federal Highway Administration.

- Maricopa County Department of Transportation would ensure that no staging work during bridge construction over the New River would occur in the floodplain south of the proposed right-of-way.

4.13 HAZARDOUS MATERIALS

4.13.1 Affected Environment

Physical Setting

The study area was examined for the presence of hazardous materials and wastes, including the area extending from Sarival Avenue on the west to approximately 0.25 mile east of US 60. Also reviewed were the areas within 0.5 mile of all associated components of all alternatives extending north and south of the project as well as along US 60 from approximately 0.1 mile northwest of the Northern Avenue/US 60 intersection southeast to Orangewood Avenue. Also examined was the area extending southeasterly from Northern Avenue at approximately Dysart Road, continuing easterly along the south side of Glendale Avenue, and finally curving northeasterly to meet with Northern Avenue at approximately 91st Avenue.

The study area is located within the Salt River valley, a broad alluvial basin within the Basin and Range physiographic province. The basin is almost completely surrounded by mountains composed primarily of granitic, metamorphic, and volcanic rocks and minor amounts of consolidated sedimentary rocks. The valley floor is underlain by unconsolidated to semiconsolidated basin-fill sediments. In the western part of the Salt River valley area, sedimentary deposits form the main water-bearing units and consist mainly of unconsolidated and weakly consolidated clay, silt, sand, and gravel. The main water-bearing unit ranges in thickness from a few tens of feet near the mountains to more than 1,200 feet in the central part of the area (Cooley 1973).

The project extends west to east across three USGS 7.5-minute topographic quadrangle maps: Waddell, Arizona, 1957 (photorevised 1971); El Mirage, Arizona, 1957 (photorevised 1982); and Glendale, Arizona (photorevised 1982). Elevations in the study area for Alternatives 1 and 2 range from 1,150 feet above mean sea level (amsl) at Sarival Avenue and Butler Avenue on the western portion of the study area to 1,090 feet amsl between Litchfield Road and Dysart Road where the project study area curves southeasterly to Northern Avenue. The elevation remains relatively even until it reaches the Agua Fria River, where it is at approximately 1,075 feet amsl, then elevates again to 1,100 feet amsl at 107th Avenue, down again to 1,075 feet amsl at New

River, then gradually ascends to the height of 1,140 feet amsl at 67th Avenue and Northern Avenue on the eastern end of the study area. For Alternative 3, elevations are generally consistent at about 1,050 amsl along Glendale Avenue between El Mirage Avenue and 99th Avenue. The general direction of surface water flow for both alternatives is easterly from Sarival Avenue to the Agua Fria River and westerly from 67th Avenue to New River.

The depth to groundwater ranges from approximately 430 feet at the Sarival and Butler avenues on the west, elevates to approximately 150 feet in the area of Dysart Road and Northern Avenue, and finally remains relatively constant at 215 feet from around 107th Avenue to 67th Avenue along Northern Avenue. Depth to groundwater along Glendale Avenue ranges from approximately 150 feet at Dysart Road to 220 feet at 99th Avenue.

The general direction of groundwater flow along the study areas of Alternatives 1, 2, and 3 is westerly to northwesterly (Hammett and Herther 1995).

Regulatory Database Review

URS Corporation (URS) reviewed information gathered from numerous environmental databases through Environmental Data Resources Inc. (EDR) to evaluate whether activities on or near the project study areas have the potential to create a Recognized Environmental Condition within the study area. EDR reviews databases compiled by federal, state, and local governmental agencies. It should be noted that the information herein has been reported as URS received it from EDR, which, in turn, reports information as it is provided in various government databases. Neither URS nor EDR can verify the accuracy or completeness of information contained in these databases. However, the use of and reliance on this information is a generally accepted practice in the conduct of environmental due diligence. (Refer to Appendix G for documents and lists that were reviewed for this study.)

One National Priorities List (NPL) site has been identified within the study area. Luke AFB, located south of the study area, is also listed as a Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) site as well as a Department of Defense site. Petroleum, oil, and lubricants along with solvents are the major sources of contamination at the site, and they have impacted groundwater in the area. The facility received final listing on the NPL in 1990, and after remediation efforts, was deleted from the NPL in 2002.

Two sites within 0.5 mile of the study area are listed on the CERCLIS – No Further Remedial Action Planned database. These sites, the Agua Fria Generating Station located at 7302 West Northern Avenue, and Country Meadows Unit 9 located at Northern and 107th avenues, have undergone environmental assessment, and the EPA has determined that no further steps would be

taken to place these sites on the NPL. If further information is provided indicating that the decision was not appropriate, the cases may be reopened. At this point, however, neither site is considered to be a potential NPL site.

There are 28 small-quantity generator sites and 3 large-quantity generator sites located within the study area. Violations have been issued at some of these generator sites, but according to EDR's database research, all of the violations have been addressed by the facilities, and all are listed as in compliance.

One Emergency Response Notification System (ERNS) site, located at 14702 West Olive Avenue, is listed as having reported an emergency release to the soil. According to information in the ERNS database, a 55-gallon phosphoric acid spill was reported in 1993, and it was cleaned up by the Santa Fe Railroad (now the BNSF). No further action is required on this case.

Three facilities were identified as the State Hazardous Waste Sites (SHWSs), including the Agua Fria Generating Station and Country Meadows Unit 9 (located at 107th Avenue and Northern Avenue), and American Continental (located at 115th Avenue and Northern Avenue). No information indicated why these facilities were listed as SHWSs; however, it should be noted that the SHWS list⁴ consists of locations subject to investigation under the state's Water Quality Assurance Revolving Fund (WQARF) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) programs. Although the list is no longer updated by the state, it contains more than 750 entries concerning possible contamination of soil, surface water, or groundwater. However, inclusion of any facility or site on this list does not necessarily indicate that the facility is contaminated, is causing contamination, or is in violation of state or federal statutes or regulations. Many of the entries were derived from neighborhood complaints or drive-by "windshield surveys" to identify potentially responsible parties for groundwater contamination.

The City of Glendale Landfill is located between 111th and 115th avenues and between Glendale Avenue and Northern Avenue. Although the southern portion of the landfill is still active, the northern portion of the facility immediately south of Northern Avenue appears to be closed.

Based on the review of regulatory information, 4 facilities are listed as having aboveground storage tanks, and 27 facilities were identified as having registered underground storage tanks (USTs) within the study area. Many of these USTs have been removed voluntarily. Two of the sites, a Shell gasoline station and a Chevron gasoline station, are located at 90th Street and

⁴ This refers to Arizona's Comprehensive Environmental Response, Compensation, and Liability Act Information and Data Systems list, also known as ACIDS.

Northern Avenue, adjacent to the centerline of Glendale Avenue. One UST is reportedly in use at the Shell station, and two are in use at the Chevron station. No product releases have been reported at either site. Seven USTs formerly were located at the Glendale Plant 12, located at 11920 West Glendale Avenue adjacent to Glendale Avenue. All seven USTs were removed between 1991 and 1996.

The presence of leaking USTs (LUSTs) was identified at 14 facilities within the study area. Five LUSTs are reportedly in use at the Glendale Municipal Airport, located 0.25 mile southeast of Glendale Avenue. No violations appear to be issued at this site. Although 11 of the 14 facilities were listed as having numerous LUST incidents, all the investigations at these sites have been closed by ADEQ with the statement that, after testing, the soil levels meet ADEQ Tier 1 requirements. The cases at the remaining three LUST sites remain under investigation. At Shepherd Service Station, located less than 0.1 mile northwest of Northern and 67th avenues along US 60, there is undefined or unknown soil contamination. At Bedrock Stone, located 0.5 mile south of Northern Avenue along 67th Avenue, the soil contamination has been defined, but the contamination is greater than that allowed under the State Soil Contamination Level requirements. This is also the case at Luke AFB, located approximately 0.5 mile south of Northern Avenue between Litchfield Road and Reams Road. There were 33 LUST incidents identified at the Luke AFB facility, but 24 of the LUST cases have been closed by ADEQ, either because the cases were combined with others, they were out of the jurisdiction of ADEQ, or cleanup of the contamination has been completed and soil levels meet ADEQ Tier 1 requirements. The remaining nine cases are still under investigation and are undergoing cleanup.

Two of the above facilities listed with closed LUST cases, the Stone Container property located on the north side of Northern Avenue at its intersection with 69th Avenue, and the Schuck & Sons development located near the northeast corner of 67th Avenue and Northern Avenue, are listed as activity and use limitation sites. Because these facilities elected either to remediate contamination found on the property to a nonresidential use level, or use an institutional or engineering control as a means to meet remediation goals, both facilities contain a Voluntary Environmental Mitigation Use Restriction, indicating that contamination still remains in place and that each property might be limited to development for nonresidential purposes.

Several facilities within the study area also contained registered dry wells. However, no Resource Conservation and Recovery Act (RCRA) treatment, storage, or disposal facilities have been recorded within the study area.

Eighteen spills also were identified within the study area. Spills ranged in type and volume as follows: 55 gallons of phosphoric acid at Amergas (located at Olive Avenue between Reams

Road and Litchfield Road); 200 gallons of diesel fuel at Northland Trucking (located near Northern and 67th avenues on US 60); 150 gallons of diesel fuel at PFX Pet Supply (located at 75th Avenue and Northern Avenue); 500 grams of dinitrophenylhydrazine (an explosive) at the Ed McCreskey residence (located at 91st Avenue and Northern Avenue); and 100 gallons of diesel fuel at United Van Lines (located at Dysart Road and Northern Avenue). In most cases, however, no information was provided in the spills list regarding the amount of the chemical, location of the spill, or type of cleanup that was involved, if any. At the Ed McCreskey residence, 500 grams of dinitrophenylhydrazine reportedly were spilled in 1994. At the United Van Lines facility, 100 gallons of diesel fuel reportedly were released in 1991. No resolution for these incidents was identified, but neither case was referred for further action.

Luke AFB and several ancillary facilities that are affiliated with the Department of Defense site are located within the study area. The first is the Luke AFB wastewater treatment plant at 7105 North El Mirage Road, situated approximately 0.1 mile north of the alignment centerline at El Mirage Road. The wastewater treatment plant has been identified as a conditionally exempt small-quantity generator, but no violations have been identified at the site.

The second ancillary facility is the Luke AFB Defense Reutilization and Marketing Office, located at 7011 North El Mirage Road, which operates a facility that stores waste tires outdoors. In addition, the site is listed on the tracking system for the Federal Insecticide, Fungicide, and Rodenticide Act, which tracks administrative cases and pesticide enforcement actions and compliance activities related to that Act, the Toxic Substances Control Act, and the Emergency Planning and Community Right-to-Know Act. According to facility detail reports, the site generates hazardous wastes (regulated under RCRA), and it treats, stores, or disposes of hazardous waste onsite (regulated under RCRA as a treatment, storage, and disposal facility). Since 1986, the facility has been issued 27 Notices of Violation, all of which have been corrected, and compliance has been achieved. Because of the Notices of Violation, the facility is tracked in the Corrective Actions Sites (CORRACTS) database. The site is also identified as a small-quantity generator.

Two solid-waste facilities/landfill sites are located within the study area. The Orangewood facility, located on the northeast corner of Orangewood and 107th avenues), currently is closed. No violations have been reported at that site.

The City of Glendale Municipal Landfill is located north of Glendale Avenue and just east of the Agua Fria River at 11480 West Glendale Avenue. While the landfill property extends from Glendale Avenue north to Northern Avenue, the active portion is located adjacent to the centerline of Glendale Avenue. The facility appears on the ERNS list because an emergency

release to the soil was reported in 1994. According to the records, a 5-gallon spill of phosphoric acid was reported. The acid was removed from the area and no injuries were reported.

The City of Glendale Municipal Landfill is also listed as a SHWS site. No specific information is available on why this facility was listed, but it should be noted that the SHWS list (or ACIDS list) consists of locations subject to investigation under the State of Arizona's WQARF and CERCLA programs. Seven facilities within the study area listed have registered dry wells. No violations have been identified with any of those sites.

A large number of sites (298) appeared as unmapped on the EDR list. These sites were not plotted on the study area map because sufficient data were lacking regarding their exact location. This list has been reviewed carefully, and it has been determined that, of the those few sites located within the boundaries of the study, none pose an environmental issue to the project.

4.13.2 Environmental Consequences

Analysis of Alternatives 1 and 2

Along the western portion of the study area, no sites were observed nor were any sites identified in reported incidents that would cause substantial environmental concern. Although two active LUST investigations are of concern due to their proximity to the site—Shepherd Service Station, located about 0.1 mile northwest of Northern and 67th avenues along US 60, and Bedrock Stone, located 0.5 mile south of Northern Avenue along 67th Avenue—these sites are not located within the path of the project. These cases are being addressed by ADEQ, and any requirements for remediation activities would be directed by that agency. LUST cases being addressed at Luke AFB are also under the jurisdiction of ADEQ and are located out of the physical range of the project.

Despite efforts by ADEQ and other agencies to identify all potentially hazardous circumstances, other sites could be identified during the construction phase that would pose an environmental concern for workers. In the event that construction activities for Alternatives 1 and 2 would include the modification or demolition of structures, including concrete structures such as culverts or pipes, etc., a hazardous material survey would be required prior to demolition activities. If suspected hazardous materials were encountered during construction, work would cease at that location and the ADOT Engineer would arrange for proper assessment, treatment, or disposal of those materials. All discarded waste (including but not limited to human waste, trash, debris, oil drums, fuel, ashes, equipment, concrete, and chemicals) generated during construction activities would be removed and/or disposed of according to federal and state regulations.

Along the central portion of the study area, an industrial park with a number of facilities is located approximately 0.25 mile north of the centerline of Alternatives 1 and 2 along El Mirage Road. While three of the facilities within the industrial park are small-quantity generators of hazardous waste, none show any violations. Properties located adjacent to the centerline of this alignment that might pose some environmental concern during the construction phase include a dairy farm, a salt-mining operation, and Shell and Chevron gasoline stations. As mentioned previously, if suspected hazardous materials were encountered during construction, work would cease at that location and the ADOT Engineer would arrange for proper assessment, treatment, or disposal of those materials.

Analysis of Alternative 3

Effects of the western and eastern portions of this alternative are the same as those described for Alternatives 1 and 2.

Along the central portion, a number of sites with environmental concerns were identified adjacent to or within 0.25 mile of the centerline. The major facilities of concern are the City of Glendale Municipal Landfill and the Defense Medical Resource Office site operated by Luke AFB. These sites are being closely monitored under the RCRA program, and any corrective action would be directed by ADEQ. In addition, the Glendale Municipal Airport is located within 0.25 mile of the centerline of the central portion. While no specific environmental concerns were identified in the EDR report, the central portion would lie within the northern runway Accident Potential Zone (APZ). Aircraft accidents that could occur in that area potentially would introduce hazardous contaminants into the study area.

As with any of the other portions of the study area, other sites could be identified during the construction phase that would pose an environmental concern for workers.

Analysis of the No Build Alternative

If the No Build Alternative were to be selected, construction of Alternatives 1, 2 or 3 would not occur. Future development of the area is expected to continue, particularly in the western portion of the study area, and it is anticipated that arterial roads would be built to support this development.

Future development in the area has the potential to affect hazardous materials sites if they are located in the areas to be developed. No observed or suspected concerns or unusual conditions were identified within the study area, so no effects would be anticipated to occur under the No Build Alternative.

Summary of Findings

Currently, many of the facilities using and disposing of hazardous materials and wastes along Alternatives 1 and 2 have been identified, and remediation efforts have been undertaken. No hazardous waste sites have been identified along this alignment that would pose risks to either construction workers or travelers along Alternatives 1 and 2.

Along the central portion of Alternative 3, the areas connecting Northern Avenue to Glendale Avenue extend along alignments that are not situated on established roadways. These areas have not previously been investigated. In addition, the presence of the City of Glendale Municipal Landfill and the Defense Medical Resource Office site operated by Luke AFB could pose some issues during construction should hazardous materials or wastes need to be removed.

4.13.3 Mitigation

Effects on hazardous materials would be minimized under all three build alternatives by implementing the following mitigation measures:

- During final design, the Maricopa County Department of Transportation would contact the Hazardous Materials Coordinator of the Arizona Department of Transportation's Environmental Planning Group (602.712.7767) to determine the need for additional site assessment.
- According to the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction* (2008 edition), Section 107, "Legal Relations and Responsibility to Public," Subsection 07, "Sanitary, Health, and Safety Provisions," should the Contractor encounter potential hazardous or contaminated material, the Contractor would immediately stop work and remove workers, barricade the area, provide traffic controls and notify the Project Engineer. The Project Engineer would arrange for proper assessment, treatment, or disposal of those materials. Such locations would be investigated and proper action implemented prior to the continuation of work in that location.
- The Maricopa County Department of Transportation's Contractor would dispose of construction debris on an as-needed basis to keep the site safe for the Contractor's personnel and the general public. Construction debris would be disposed of only in a manner or in a location approved by the Project Engineer. The Contractor would be responsible for the safe and clean condition of the site during the entire period the site is under the Contractor's care, custody, and control.

- According to the Arizona Department of Transportation’s *Standard Specifications for Road and Bridge Construction* (2008 edition), Section 1001, “Material Sources,” Subsection 2, “General,” any material sources required for this project outside the project area would be examined for environmental effects, by the Contractor, prior to use.
- According to the Arizona Department of Transportation’s *Standard Specifications for Road and Bridge Construction* (2008 edition), Section 107, “Legal Relations and Responsibility to Public,” Subsection 11, “Protection and Restoration of Property and Landscape,” “[m]aterials removed during construction operations such as trees, stumps, building materials, irrigation and drainage structures, broken concrete, and other similar materials shall not be dumped on either private or public property unless the Contractor has obtained written permission from the owner or public agency with jurisdiction over the land. Written permission would not be required, however, when materials are disposed of at an operating, public dumping ground.” The Contractor will dispose of excess waste material and construction debris at a municipal landfill approved under Title D of the Resource Conservation and Recovery Act, construction debris landfill approved under the Arizona Revised Statutes Title 49, Section 241, Permit Required to Discharge, administered by the Arizona Department of Environmental Quality, an inert landfill, or at another approved site.
- The Maricopa County Department of Transportation would make reasonable effort to locate and identify potentially hazardous materials and/or underground storage tanks within the study area prior to construction. In the event material is found by the Contractor or subcontractors of any tier, during the performance of the work that is suspected to be hazardous. The Contractor would stop work at the affected area and remove all personnel from that area as well as barricade the area and provide traffic control to prohibit unauthorized entry. The Contractor would immediately notify the Project Engineer to determine resolution of the matter.

4.14 SUMMARY OF ENVIRONMENTAL IMPACTS

Table 4-8 summarizes the potential environmental impacts for each build alternative.

The No Build Alternative would consist of Northern Avenue as exists currently with no major improvements, as proposed for each build alternative. Any improvements that would be implemented would occur within the existing right-of-way and would include the installation of additional traffic control devices, operational improvements, and general maintenance. Neighborhood and commercial access is assumed to remain as it exists currently.

**Table 4-8
Summary of Environmental Impacts**

Evaluation Factors	Alternative 1 (Option 1 Signals)	Alternative 2 (Option 2 No Signals)	Alternative 3 (Southern Alignment)
Land Use, Ownership and Jurisdiction			
1. Estimated acreage of agricultural uses converted to transportation uses	<ul style="list-style-type: none"> • 131 acres 	<ul style="list-style-type: none"> • Same as Alternative 1 	<ul style="list-style-type: none"> • 154 acres
2. Number of residential properties affected by right-of-way acquisition	<ul style="list-style-type: none"> • 28 properties 	<ul style="list-style-type: none"> • Same as Alternative 1 	<ul style="list-style-type: none"> • 22 properties
3. Number of commercial/industrial properties affected by right-of-way acquisition	<ul style="list-style-type: none"> • 9 properties 	<ul style="list-style-type: none"> • Same as Alternative 1 	<ul style="list-style-type: none"> • 10 properties
4. Estimated total acreage of land use conversion (right-of-way requirements)	<ul style="list-style-type: none"> • 305 acres 	<ul style="list-style-type: none"> • 313 acres 	<ul style="list-style-type: none"> • 426 acres
5. Property severance	<ul style="list-style-type: none"> • Requires small right-of-way acquisitions from individual properties • Limited severance 	<ul style="list-style-type: none"> • Same as Alternative 1 	<ul style="list-style-type: none"> • Western and eastern portions require small right-of-way acquisitions from individual properties • Central portion diagonally severs properties
6. Changes in property or neighborhood access	<ul style="list-style-type: none"> • Provides regional access to commercial properties in western portion, but modifies existing access • Restricts existing commercial and neighborhood access in central and eastern portions • Provides new access as mitigation • Signals provide traditional neighborhood access • Requires additional streets to maintain reasonable access 	<ul style="list-style-type: none"> • Provides regional access to commercial properties in western portion, but modifies existing access • Restricts existing commercial and neighborhood access in central and eastern portions • Provides new access as mitigation • Restricted neighborhood access • Requires additional streets to maintain reasonable access 	<ul style="list-style-type: none"> • Provides regional access to commercial properties in western and central portions, but modifies existing access • Restricts some existing commercial and neighborhood access in eastern portion, but maintains access in central portion • Provides new access as mitigation • Requires additional streets to maintain reasonable access

Table 4-8 (continued)
Summary of Environmental Impacts

Evaluation Factors	Alternative 1 (Option 1 Signals)	Alternative 2 (Option 2 No Signals)	Alternative 3 (Southern Alignment)
Utilities			
1. Relocation of existing utilities	<ul style="list-style-type: none"> Requires utility coordination and relocations throughout the alignment 	<ul style="list-style-type: none"> Same as Alternative 1 	<ul style="list-style-type: none"> Same as Alternatives 1 and 2, but has fewer utilities in the central portion
Socioeconomics, Environmental Justice			
1. Community character and cohesion	<ul style="list-style-type: none"> Character of rural western portion is changing due to urban growth occurring in the project area Project would affect community character and cohesion in developed central and eastern portions due to changes in neighborhood connectivity and access, and scale of roadway features 	<ul style="list-style-type: none"> Same as Alternative 1 	<ul style="list-style-type: none"> Character of rural western portion and undeveloped central portion is changing due to urban growth occurring in the project area Project would affect community character and cohesion in eastern portion due to changes in connectivity and access, and scale of roadway features
2. Existing acreage of taxable land base converted to nontaxable use	<ul style="list-style-type: none"> 305 acres 	<ul style="list-style-type: none"> 313 acres 	<ul style="list-style-type: none"> 426 acres
3. Minority population ¹ (percentage of affected census tracts)	<ul style="list-style-type: none"> 50 percent 	<ul style="list-style-type: none"> Same as Alternative 1 	<ul style="list-style-type: none"> 61 percent
4. Low-income population ¹ (percentage of affected census tracts)	<ul style="list-style-type: none"> 57 percent 	<ul style="list-style-type: none"> Same as Alternative 1 	<ul style="list-style-type: none"> 48 percent
5. Elderly population ¹ (percentage of affected census tracts)	<ul style="list-style-type: none"> 25 percent 	<ul style="list-style-type: none"> Same as Alternative 1 	<ul style="list-style-type: none"> 17 percent
6. Residential displacements/relocations (approximate number)	<ul style="list-style-type: none"> 44 displacements 	<ul style="list-style-type: none"> Same as Alternative 1 	<ul style="list-style-type: none"> 24 displacements
7. Business displacements/relocations (approximate number)	<ul style="list-style-type: none"> 9 displacements/relocations 	<ul style="list-style-type: none"> Same as Alternative 1 	<ul style="list-style-type: none"> 10 displacements/relocations
Visual Resources			
1. Modification of views from sensitive viewpoints	<ul style="list-style-type: none"> Approximately half of alignment modifies views from residential viewpoints 	<ul style="list-style-type: none"> Same as Alternative 1 	<ul style="list-style-type: none"> Approximately one-third of alignment modifies views from residential viewpoints

Table 4-8 (continued)
Summary of Environmental Impacts

Evaluation Factors	Alternative 1 (Option 1 Signals)	Alternative 2 (Option 2 No Signals)	Alternative 3 (Southern Alignment)
Noise			
1. Number of sensitive receivers eligible for traffic noise mitigation	• 62 sensitive receivers	• 63 sensitive receivers	• 37 sensitive receivers
Cultural Resources			
1. Impacts on National Register-eligible archaeological sites	• One archaeological site may be affected, but effects can be mitigated satisfactorily by data recovery	• Same as Alternative 1	• 2 archaeological sites may be affected, but effects can be mitigated satisfactorily by data recovery
2. Impacts on National Register-eligible historic buildings and structures	• A Programmatic Agreement is being finalized among the FHWA, SHPO, ADOT, MCDOT, and the cities of Glendale, Surprise, and Peoria that would indicate how potential archaeological and cultural resources would be treated, should they be encountered during construction activities	• Same as Alternative 1	• Same as Alternative 1
Section 4(f) Properties			
1. Presence of Section 4(f) Properties in project area	• Santa Fe, Prescott & Phoenix Railroad (<i>de minimis</i>) • Raymond Kellis High School (no impact to recreational uses)	• Same as Alternative 1	• Same as Alternative 1
Air Quality			
1. Carbon monoxide 8-hour and 1-hour standards	• Predicted concentrations do not exceed federal or state standards	• Same as Alternative 1	• Same as Alternative 1
2. Particulate matter standards (PM ₁₀ and PM _{2.5})	• Unlikely to cause or contribute to an exceedance of PM ₁₀ standards • Short-term construction impacts can be mitigated	• Same as Alternative 1	• Same as Alternative 1
3. Transportation conformity	• Achieves conformity	• Same as Alternative 1	• Same as Alternative 1
Prime and Unique Farmlands			
1. Conversion of prime and unique farmland (estimated acreage)	• No prime or unique farmlands, unless irrigated • 131 acres agriculture converted	• Same as Alternative 1	• No prime or unique farmlands, unless irrigated • 153 acres agriculture converted

Table 4-8 (continued)
Summary of Environmental Impacts

Evaluation Factors	Alternative 1 (Option 1 Signals)	Alternative 2 (Option 2 No Signals)	Alternative 3 (Southern Alignment)
Water Resources, Floodplains, and Jurisdictional Waters			
1. Conversion of floodplains (estimated total acreage)	<ul style="list-style-type: none"> • Agua Fria River floodplain altered by other factors • No project changes to floodplains 	• Same as Alternative 1	• Same as Alternative 1
2. Loss of jurisdictional waters (estimated acreage)	<ul style="list-style-type: none"> • Agua Fria River – 1.6 acres (3.9 acres post channelization) • New River – 3.7 acres 	• Same as Alternative 1	<ul style="list-style-type: none"> • Agua Fria River – 4.3 acres (5.9 acres post channelization) • New River – 7.5 acres • Wetlands occur in vicinity of central portion
Biological Resources			
1. Conversion of plant communities (acres)	<ul style="list-style-type: none"> • Sonoran desertscrub – 34 acres • Riparian – 4 acres 	• Same as Alternative 1	<ul style="list-style-type: none"> • Sonoran desertscrub – 102 acres • Riparian – 9 acres
2. Loss of wildlife of special concern	• Minimal potential for effects on wildlife of special concern	• Same as Alternative 1	• Same as Alternative 1
3. Loss of threatened and endangered species	• Minimal potential for effects on threatened and endangered species	• Same as Alternative 1	• Same as Alternative 1
4. Loss of habitat connectivity	• Potential in western portion	• Same as Alternative 1	• Potential in western and central portions
Hazardous Materials			
1. Number of potential hazardous materials sites in proximity	• 14 sites	• Same as Alternative 1	• 12 sites

NOTES:

¹ Where percentages of these populations are significantly higher than Maricopa County overall percentages

National Register = National Register of Historic Places

PM₁₀ = particulate matter equal to or smaller than 10 microns in diameter

PM_{2.5} = particulate matter equal to or smaller than 2.5 microns in diameter