U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

As Lead Federal Agency pursuant to the National Environmental Policy Act of 1969

FINAL ENVIRONMENTAL IMPACT STATEMENT

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
Phoenix, Maricopa County, Arizona

This Final Environmental Impact Statement (EIS) assesses the potential environmental impacts of the proposed Airport Development Program (ADP) as well as seven alternatives to the proposed project including the No-Action Alternative. This Final EIS addresses the environmental impacts anticipated from the proposed Airport Development Program as identified in the Airport Layout Plan for Phoenix Sky Harbor International Airport. Specifically, this Final EIS includes the evaluation of the following projects and associated developments proposed by the City of Phoenix – construction and operation of a new West Terminal Complex, demolition of Terminal 2, construction of Stage 2 of the Automated People Mover, construction of Crossfield Taxiways Uniform "U" and Victor "V", modification of Sky Harbor Boulevard, and modification of Concourse N4 International Gates in Terminal 4.

The ADP Alternative, as well as the No-Action Alternative, have been assessed in detail and the potential impacts are disclosed within this document. This Final EIS has been prepared pursuant to the following public law requirements: Section 102(2)(c) of the National Environmental Policy Act of 1969 and Section 509(b)(5) of the Airport and Airway Improvement Act of 1962, as amended.

VOLUME 1: DOCUMENTATION

FEBRUARY 2006

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GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT? This document contains a Final Environmental Impact Statement (EIS) for the proposed Airport Development Program at the Phoenix Sky Harbor International Airport (PHX). This document presents the analysis of the potential impacts of the No-Action Alternative and Airport Development Program (ADP) Alternative as shown on the PHX Airport Layout Plan (ALP). The City of Phoenix Aviation Department (City) has advised the FAA that the ADP Alternative is their preferred alternative.

BACKGROUND. A Notice of Intent to prepare an EIS was published in the Federal Register on March 12, 2001. Scoping Meetings for both agencies and the public were held on April 23, 2001 to introduce the proposed project and provide an overview of the EIS process. On October 16, 2002, FAA conducted a public workshop in which airport representatives and the consultant team were available for one-on-one discussions about the status of the project. The Draft EIS was released on June 10, 2005. Public information meetings and public hearings on the Draft EIS were conducted on July 12th and 13th, 2005 at the Phoenix Airport Marriott and Wesley Community Center, respectively. Subjects covered during the public information meetings included an overview of the EIS process, the Proposed Project, purpose and need of the project, potential alternatives, and discussions concerning environmental impact categories (i.e., noise, air quality, etc.) evaluated in the Draft EIS. Based on a request from a local agency, FAA extended the comment period for the Draft EIS for the proposed improvements at PHX from July 26, 2005 to August 10, 2005. Advertisements were placed in local newspapers to inform the general public and other interested parties that the comment period had been extended.

The document presented herein represent the Final EIS for the federal decision-making process, in fulfillment of FAA's policies and procedures relative to NEPA and other related federal requirements. Copies of the document are available for inspection at various libraries in the Phoenix metropolitan area, Phoenix Sky Harbor International Airport, and at the FAA Western-Pacific Region Office in Hawthorne. The addresses for these locations are provided in Chapter 7.0 of this Final EIS.

WHAT HAPPENS AFTER THIS? The FAA will issue a Record of Decision (ROD) pursuant to Title 40, Code of Regulations, Section 1506.10 and the project may begin, as funds become available.

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EXECUTIVE SUMMARY

INTRODUCTION

The Final Environmental Impact Statement (FEIS) for the proposed Airport Development Program (ADP) at Phoenix Sky Harbor Airport (PHX) has been prepared by the Federal Aviation Administration (FAA) in conformance with the President's Council on Environmental Quality (CEQ) regulations that implement the procedural provisions of the National Environmental Policy Act of 1969 (NEPA); and in accordance with the requirements of FAA Orders 1050.1E, *Environmental Impacts: Policies and Procedures* and 5050.4A, *Airport Environmental Handbook*. The purpose of the FEIS is to consider and disclose the potential environmental impacts that may result from construction and operation of the proposed project and reasonable alternatives to the proposed project, and to provide decision-makers and the public with sufficient information to make informed decisions when planning future actions.

THE PROPOSED PROJECT AND ALTERNATIVES

The City of Phoenix Aviation Department (City) has proposed terminal, airfield, and surface transportation improvements at PHX that would enhance the airport's ability to accommodate future passenger requirements and improve the efficiency of airport operations. The proposed improvements would further the City's objective to meet passenger demand while continuing to provide airline passengers and tenant airlines with a level of service consistent with that historically provided.

In preparation for development of the EIS at PHX a forecast of aviation activity at the airport was prepared to assist in the evaluation of future operational requirements at the airport. The forecast of aviation activity (LFA, 2003) was submitted to the FAA in October of 2002 and approved by the FAA on January 8, 2003. The aviation forecast indicates that passenger enplanements at PHX will increase from 18.6 million passengers in 2003 to approximately 25.2 million in 2015 (LFA, 2003). On an annual basis, the FAA prepares an official forecast of aviation activity called the Terminal Area Forecast System (TAF). As part of the TAF projections, detailed forecasts are prepared for major users of the National Airspace System that include large air carriers, air taxi/commuters, general aviation, and the military. To verify that the estimates of aviation activity projected in the PHX forecast were within the acceptable range as defined by FAA a review and comparison was made with FAA's January 2005 TAF for PHX. FAA guidance relating to the suitability of forecasts for use in environmental and planning decisions requires that a sponsor's forecast be within 15 percent of the TAF in the 10-year forecast period (Revision to Guidance on Review and Approval of Aviation Forecasts, FAA, 2004). The results of the comparison analysis found that the aviation forecast developed for PHX was within the range of FAA acceptability for use in preparation of the FEIS. However, a sensitivity analysis was performed to assess the potential impacts associated with the 2005 TAF. A copy of the Aviation Forecast Sensitivity Analysis is provided in **Appendix H** of this FEIS.

To meet the projected passenger demand, the City is proposing landside and airside improvements at PHX that are intended to alleviate congestion and shortfalls of the existing facilities and to enable the airport to more effectively meet the needs of the traveling public. The proposed improvements at Sky Harbor Airport would not result in an increase in the number of aircraft operations beyond that currently

projected in the FAA approved aviation forecast, but would improve the efficiency of landside passenger handling facilities, airfield operations and the on-airport roadway systems. The ability of PHX to accommodate air carrier, cargo, military, and general aviation operations is a function of the number and configuration of the runway system, air traffic operational procedures and supporting navigational aids, and the ability of landside facilities to service aircraft and process passengers in balance with airfield operational levels. The proposed Airport Development Program (ADP) project would not increase the operational capacity of the airfield at PHX, or affect the inherent annual service volume of the airport. The demand for airline service into and out of the airport is created by the need for air transportation in the air service region, and not by the condition or size of the terminal facilities at the airport. As a consequence, it is assumed in the FEIS that the same number of enplaned passengers and aircraft operations would need to be processed in 2015 under the No-Action Alternative as under the other reasonable alternatives evaluated.

For PHX or any airport to operate efficiently, terminals and supporting systems should be able to process passengers at a rate commensurate with the ability of the airfield to move aircraft and passengers into and out of the airport. At PHX, the capacity of the airfield to move aircraft and passengers into and out of the airport exceeds the level of traffic that can be accommodated in the current terminal configuration at the desired level of service. The effects of this imbalance will become more severe in the future, as the number of aircraft operations at the airport increases, consistent with the FAA approved aviation forecast. The availability of additional landside facilities would allow PHX to accommodate forecast demand and maintain an acceptable level of service to passengers. The proposed ADP project at PHX includes the following:

- Demolition of Terminal 2 and Ancillary Facilities;
- West Terminal Development (33-gate terminal), Garage, and Terminal Roadways;
- Modifications to Terminal 4, Concourse N4 International Gates;
- Construction of Crossfield Taxiways Uniform "U" and Victor "V;"
- Sky Harbor Boulevard Modifications; and
- Construction of Stage 2 of the Automated People Mover System (APM).

Figure S-1 presents a graphic overview of the proposed ADP project. Along with the proposed project, the FAA considered numerous alternatives to the proposed development program including the use of other airports, alternative terminal locations within the airport boundary, and alternative terminal configurations. **Figure S-2** shows the location of alternative terminal sites that were evaluated by the FAA as part of the alternatives analysis. In addition to alternative terminal locations, the FAA considered modifications to the existing Terminal 3 facilities to accommodate future passenger demand at PHX (see **Figure S-3**). The FAA also considered a No-Action Alternative.

Light-Rail Transit,
44th Street
Connector Station

WASHINGTON STREET
JEFFERSON STREET
24TH STREET
UNION PACIFIC RAILROAD
39TH STREET
UNION PACIFIC RAILROAD
AIRPORT BEACON
AIR LANE BOULEVARD
AIRCRAFT PARKING LIMIT
TAXIWAY V
TAXIWAY U
Terminal 3
Terminal 4
EEPG
SALT RIVER
SERVICE ROAD
SALT RIVER
Cargo
Air
National
Guard
UNIVERSITY DRIVE
UNIVERSITY DRIVE

N

0 700 1,400 2,100

Graphic Scale in Feet

SCALE: 1"=1,400'

LEGEND

- Terminal Area of Demolition and Construction
- West Terminal Complex
- Apron
- Crossfield Taxiways
- Future Parking Garage
- Terminal 2 Parking To Be Demolished
- APM Station Stage 2
- Future APM Maintenance Facility
- APM Stage 2
- Modification to Terminal 4, Concourse N4 International Gates
- Modification/ Realignment of Sky Harbor Blvd.

Source: West Terminal EIS Project Description, March 2004, DMJM Aviation/HDR.
2005 ALP, November 2005, Rocondo & Associates.

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Airport Development Program
Proposed Projects

FIGURE
S-1

J:\PHX EIS\ALP\ALP 4-2005\S-1.dwg 12/16/2005 8:38

Alternative 8
North Airport
Site

Alternative ~~5~~
West Airport
Site

Alternative 6
and 7 Central
Core Sites

Terminal 2

Terminal 3

Terminal 4

EEPG

Alternative 4
South Airfield
Site

N

0 800 1,600 2,400
Graphic Scale in Feet
SCALE: 1"=1,600'

LEGEND
- Alternate Site Locations
- Existing Property Line
- Future Proposed Property Line

Source: West Terminal EIS Project Description, March 2004, DMJM Aviation/HDR.
ALP, City of Phoenix, Phoenix Sky Harbor International Airport.
URS Corporation, 2004.
2005 ALP, November 2005, Rocondo & Associates.

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Alternative Terminal Development Site Locations
at Phoenix Sky Harbor International Airport

FIGURE
S-2

J:\PHX EIS\ALP\ALP 4-2005\S-2.dwg 12/16/2005 8:36

REMOTE AIRCRAFT HOLDROOM

NORTH CONCOURSE

NE CONCOURSE

APM STATION

ATC

TERMINAL 3 EXPANSION

TERMINAL 3

PARKING STRUCTURE

SW CONCOURSE

REMOTE AIRCRAFT HOLDROOM

SOUTH CONCOURSE

MALSR

N

0 300 600 900

Graphic Scale in Feet

SCALE: 1"=600'

LEGEND

- Existing Buildings
- Terminal 3 Expansion
- Existing Road
- Future Taxiway Pavement
- Remote Aircraft Parking Position Ramp
- APM Stage 2 Station
- APM Stage 2
- Terminal 2 Parking To Be Demolished
- Modification/ Realignment of Sky Harbor Blvd, as Part of Terminal 3 Expansion Alternative

Source: DMJM Aviation/HDR Planning Team, August, 2003
2005 ALP, November 2005, Rocondo & Associates.

J:\PHX EIS\ALP\ALP 4-2005\S-3.dwg 12/16/2005 8:39

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Expansion of Existing Facilities

FIGURE S-3

FAA'S ENVIRONMENTAL RESPONSIBILITIES

In recognizing the importance of protecting the environment, the U.S. Congress enacted the National Environmental Policy Act (NEPA) in 1969 to encourage Federal agencies to make decisions that are based on understanding environmental consequences, and take actions that protect, restore and enhance the environment. NEPA requires Federal agencies to treat environmental impact as a primary criterion in evaluating a proposed action. It also requires Federal agencies to analyze and consider mitigation for those impacts, and to provide interested parties to participate in the environmental review process. In addition, Federal agencies must consider a "No-Action Alternative."

The City has proposed terminal, airfield, and surface transportation improvements at PHX to accommodate forecast passenger demand, while providing airline passengers and tenant airlines with a level of service consistent with that historically provided at the airport. The proposed roadway improvements and APM system would improve the efficiency of traffic and passenger movements, and will enhance air quality by reducing surface traffic on airport roadways. The proposed ADP would provide an efficient level of service to passengers, airlines, and tenants at PHX.

The FAA is responsible for complying with NEPA whenever an airport sponsor seeks approval of an Airport Layout Plan (ALP) for proposed projects not previously identified on an ALP. The FAA reviewed the proposed project at PHX and determined that an EIS would be the most appropriate document for the Agency to fulfill its obligations under NEPA and FAA Orders 1050.1E (FAA, 2004) and 5050.4A (FAA, 1985). FAA's determination to proceed with an EIS is based on the project's potential to be controversial with respect to possible air quality impacts and the anticipated level of public interest. In March 2001, the FAA published a Notice of Intent (NOI) to prepare an EIS for the proposed project at PHX. Public and agency scoping meetings were held in April 2001 to receive comments regarding the scope of the analysis and identify any potential environmental impacts associated with the proposed project. A Notice of Availability (NOA) for the draft EIS was published in the Federal Register on June 10, 2005. The public and agency comment period on the draft EIS closed on August 10, 2005.

PURPOSE AND NEED FOR THE PROPOSED PROJECT

The purpose and need for the proposed Federal actions is to 1) meet the needs of the National Airspace System, 2) improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers (LFA, 2003), 3) maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time, and 4) improve access to the airport and the efficiency of the on-airport roadway system. The proposed improvements would meet the objective of the City of Phoenix to accommodate forecast demand while balancing the capacity of airside and terminal facilities and continuing to provide an acceptable level of service to passengers and tenant airlines consistent with historical practice at PHX.

The proposed Federal actions being considered in this FEIS include FAA's approval of the ALP for development of terminal facilities and associated projects at PHX and potential Federal funding or approval for use of passenger facility charges. The ALP (Figure S-4) identifies major redevelopment items that constitute the City of Phoenix's current project proposal, including the construction of terminal facilities, crossfield taxiways, Stage 2 of the APM, roadway improvements, and associated projects. Table S-1 provides a summary of the purpose and need for each of the proposed ADP project.

ALTERNATIVES

Chapter 2.0, Alternatives, describes the alternatives evaluation and screening process used by the FAA. It also presents a rigorous exploration of possible alternatives, provides reasoning as to why some alternatives were eliminated from detailed study, and describes those reasonable alternatives that were retained for detailed evaluation.

ALTERNATIVES EVALUATION PROCESS

In accordance with the CEQ regulations and FAA Order 1050.1E, the FAA is required to evaluate all alternatives that are reasonable and achieve the project's purpose. The FAA completed a thorough and objective review of reasonable alternatives to the City of Phoenix Aviation Department's proposed project at PHX in accordance with CEQ regulations, Section 1502.14. In consideration of CEQ regulations, the FAA rejected alternatives if they showed no possibility of meeting the project purpose and/or need, as described in Chapter 1.0, Purpose and Need of the FEIS, or offered no prospect of being built.

Level 1 Evaluation Criteria: Purpose and Need

A Level 1 analysis was performed to determine which alternatives met the purpose and need criteria as described in Chapter 1.0, Purpose and Need. Level 1 screening criteria include the following:

- Improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers;
- Maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating times; and
- Improve access to the airport and efficiency of the on-airport roadway system.

Reasonable alternatives for the proposed project were identified and evaluated in consideration of the Level 1 criteria. Those alternatives that met the purpose and need criteria were retained for evaluation with respect to the Level 2: Site Acceptability screening.

Building Inventory

101	RENTAL CAR COMPLEX (HERTZ)	203	RENTAL CAR COMPLEX (NATIONAL)	262	FUTURE TECHNOLOGY BUILDING	310	AIR CARGO COMPLEX, SOUTH
102	RENTAL CAR COMPLEX (HERTZ)	204	RENTAL CAR COMPLEX (NATIONAL)	263	CENTER AIRFIELD ELECTRICAL VAULT	311	SOUTH ELECTRICAL VAULT
120	SMALL 4-UNIT T-HANGAR	205	RENTAL CAR COMPLEX (NATIONAL)	264	ARFF BUILDING 19	312	FBO HANGAR/OFFICES (SWIFT)
121	SMALL 4-UNIT T-HANGAR	206	MAINTENANCE BUILDING	265	AMERICA WEST MAIL SORT	315	ARIZONA AIR NATIONAL GUARD COMPLEX
122	SMALL 4-UNIT T-HANGAR	207	REMOTE TRANSMITTER RECEIVER (RTR-3)	270	RENTAL CAR GARAGE	316	AIRPORT SURVEILLANCE RADAR (ASR-9)
123	SMALL 4-UNIT T-HANGAR	208	COMMERCIAL BUILDING (LSG/SKY CHEF)	271	FIRE PUMP HOUSE (AMS)	401	SACRED HEART CATHOLIC CHURCH
124	8-UNIT EXECUTIVE HANGAR	209	COMMERCIAL BUILDING (LSG/SKY CHEF)	272	TRITURATOR	402	HONEYWELL
125	AIRCRAFT WASHRACK	210	CNG FACILITY	275	TERMINAL 4 (CORE)	403	WYLE ELECTRONICS
126	8-UNIT EXECUTIVE HANGAR	221	FAA BUILDING/TRACON	276	TERMINAL 4 (CONCOURSE N-1)	404	BANK OF AMERICA COMPLEX
127	2-UNIT CORPORATE HANGAR	222	EXECUTIVE TERMINAL	277	TERMINAL 4 (N-1 TO N-2 CONNECTING BRIDGE)	405	RENTAL CAR CENTER
128	8-UNIT EXECUTIVE HANGAR	223	PAINT STORAGE	278	TERMINAL 4 (CONCOURSE N-2)		
129	CORPORATE HANGAR AND SHOP (SALT RIVER PROJECT)	224	GREENHOUSE	279	TERMINAL 4 (N-2 TO N-3 CONNECTING BRIDGE)		
130	CORPORATE HANGAR AND SHOP (DEPT OF PUBLIC SAFETY)	225	FLEET MAINTENANCE BUILDING	280	TERMINAL 4 (CONCOURSE N-3)		
131	COMMERCIAL BUILDING (EMBRY-RIDDLE)	226	DRY STORAGE	281	TERMINAL 4 (N-3 TO N-4 CONNECTING BRIDGE)		
132	AIRCRAFT WASHRACK	227	2-STORY OFFICE BUILDING (AVIATION DEPT)	282	TERMINAL 4 (CONCOURSE N-4, INTERNATIONAL)		
133	EXECUTIVE HANGAR	228	RESTROOMS - TAXI HOLDING AREA	283	TERMINAL 4 (N-4 TO S-4 CONNECTING BRIDGE)		
134	COMMERCIAL BUILDING (VACANT)	229	AIR CARGO COMPLEX, WEST	284	FUTURE TERMINAL 4 (S-1 TO N-1 CONNECTING BRIDGE)		
135	RESTAURANT/LOUNGE (LEFT SEAT)	230	FUTURE AIR CARGO SUPPORT	285	FUTURE TERMINAL 4 (CONCOURSE S-1)		
136	HANGAR/OFFICES (SCENIC AIR)	239	MAINTENANCE SHOP (DELTA)	286	FUTURE TERMINAL 4 (S-1 TO S-2 CONNECTING BRIDGE)		
137	HANGAR/OFFICES (VACANT)	240	MAINTENANCE SHOP (DELTA)	287	FUTURE TERMINAL 4 (CONCOURSE S-2)		
138	HANGAR (AIREVAC)	241	MAINTENANCE SHOP (AMERICAN)	288	TERMINAL 4 (CONCOURSE S-3)		
139	AIRCRAFT WASHRACK	242	MAINTENANCE SHOP (DYNAIR FUELING)	289	TERMINAL 4 (S-3 TO S-4 CONNECTING BRIDGE)		
140	OFFICES (CIVIL AIR PATROL)	246	GATEHOUSE	290	TERMINAL 4 (S-4 CONCOURSE)		
141	ARFF BUILDING 29	247	PARKING STRUCTURE - TERMINAL 2	291	COMMUTER BOARDING		
142	INDUSTRIAL COMPLEX (ALLIED SIGNAL)	248	TERMINAL 2 (CORE)	292	AIRLINE MAINTENANCE HANGAR (AMERICA WEST)		
143	8-UNIT EXECUTIVE HANGAR	249	TERMINAL 2 (SOUTH CONCOURSE)	293	AIRLINE MAINTENANCE HANGAR (SOUTHWEST)		
144	CORPORATE HANGAR AND SHOP (MESA AIRLINES)	250	TERMINAL 2 (EAST CONCOURSE)	294	FUTURE TERMINAL 4 (S-2 TO S-3 CONNECTING BRIDGE)		
145	FUEL TERMINAL (DYNAIR FUELING)	251	AIRPORT OPERATIONS CENTER	295	FUTURE EAST ECONOMY PARKING GARAGE 'C'		
147	FUTURE WEST TERMINAL (CONCOURSE)	252	FAA OFFICES	298	FUTURE CNG FACILITY		
148	FUTURE WEST TERMINAL (CONNECTING BRIDGE)	253	FAA CONTROL TOWER	301	RENTAL CAR COMPLEX (BUDGET)		
149	FUTURE WEST TERMINAL (CONCOURSE)	254	FAA OFFICES	302	RENTAL CAR COMPLEX (BUDGET)		
150	FUTURE WEST TERMINAL (PARKING GARAGE)	255	TERMINAL 3 (NORTH CONCOURSE)	303	RENTAL CAR COMPLEX (BUDGET)		
151	FUTURE WEST TERMINAL (TERMINAL)	256	TERMINAL 3 (CORE)	304	RENTAL CAR COMPLEX (BUDGET)		
152	FUTURE WEST TERMINAL (CONCOURSE)	257	BUNKER & CONVEYOR BUILDING	305	EAST ECONOMY PARKING GARAGE 'A'		
153	FUTURE WEST TERMINAL (CONNECTING BRIDGE)	258	TERMINAL 3 (SOUTH CONCOURSE)	306	EAST ECONOMY PARKING GARAGE 'B'		
154	FUTURE WEST TERMINAL (CONCOURSE)	259	PARKING STRUCTURE - TERMINAL 3	307	OFFICE FOR FORESTRY SERVICE		
155	FUTURE WEST TERMINAL (CONNECTING BRIDGE)	260	NORTH AIRFIELD ELECTRICAL VAULT	308	FBO HANGAR/OFFICES (CUTTER)		
156	FUTURE WEST TERMINAL (CONCOURSE)	261	FUTURE AIR TRAFFIC CONTROL TOWER	309	FBO HANGAR/OFFICES (CUTTER)		

Airport Monuments

LEGEND	POINT	DESCRIPTION
Ⓖ		PAC
Ⓗ		SAC
Ⓙ		SAC
Ⓜ		PAC
Ⓝ		SAC
Ⓟ		SAC
①	LAT: 33° 26' 27.10" LON: 112° 01' 47.27"	RW 8
②	LAT: 33° 26' 28.96" LON: 111° 59' 31.69"	RW 26
③	LAT: 33° 25' 51.81" LON: 112° 01' 37.58"	RW 7L
④	LAT: 33° 25' 51.73" LON: 111° 59' 38.04"	RW 25R
⑤	LAT: 33° 25' 43.69" LON: 112° 01' 37.57"	RW 7R
⑥	LAT: 33° 25' 43.63" LON: 112° 00' 05.54"	RW 25L

NOTES

1 HELIPAD IS DEACTIVATED INDEFINITELY.

2 EACH MONUMENT HAS BEEN SURVEYED, AND ALL CONTRACTORS WILL BE MADE AWARE OF THEIR LOCATION PRIOR TO ANY WORK PERFORMED AT THE AIRPORT.

3 CONTROLS FOR AREAS WITHIN THE RPZ AND OUTSIDE THE AIRPORT PROPERTY LINE TO BE DETERMINED.

4 TAXIWAY WIDTHS ARE TYPICALLY 75', UNLESS NOTED OTHERWISE.

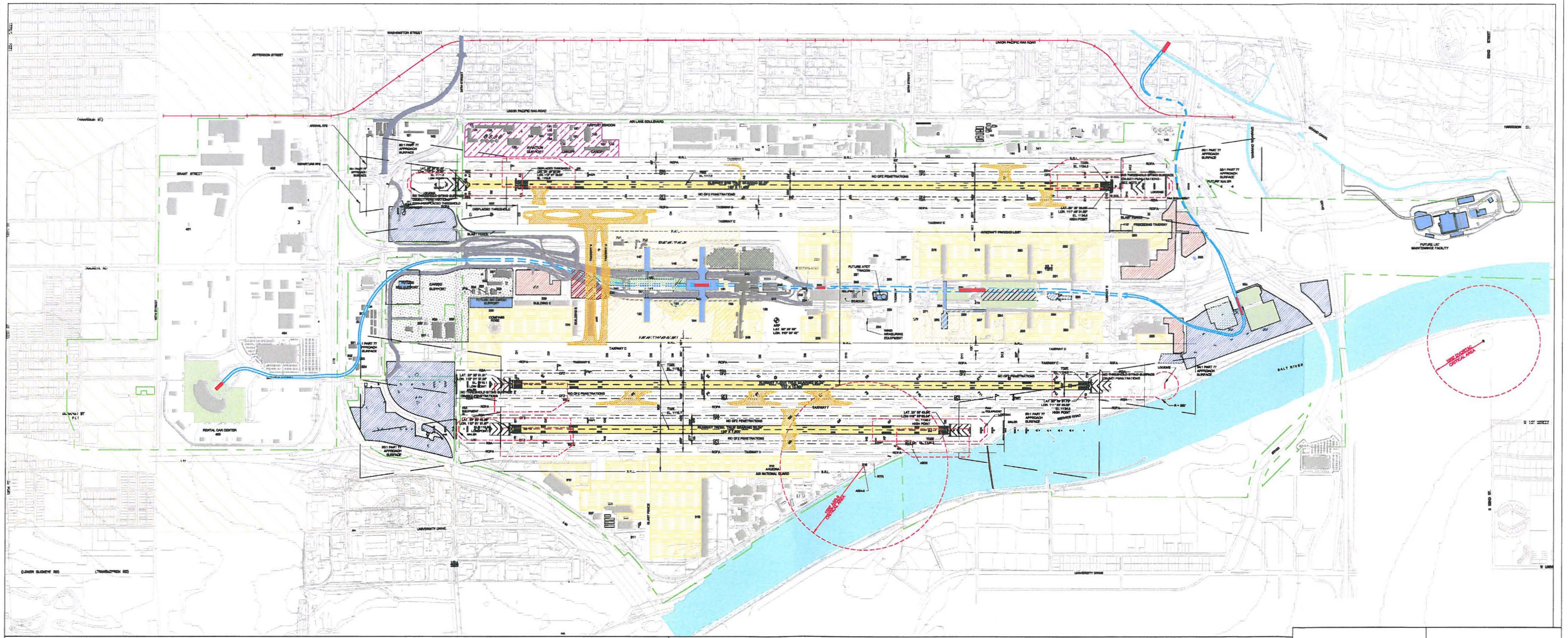
5 RUNWAY 26 AOA ROADWAY PENETRATES 34:1 THRESHOLD SITING SURFACE. VEHICLES WILL BE RESTRICTED.

Legend

EXISTING	FUTURE	DESCRIPTION
— — —	SAME	AIRPORT PROPERTY LINE (APL)
▭	▭	BUILDING
NONE	▭	BUILDING TO BE REMOVED
═	▬	ROAD
—+—+—	—+—+—	RAILROAD
—B.R.L.—	SAME	BUILDING RESTRICTION LINE
—ROFA—	SAME	RUNWAY OBJECT FREE AREA
—RSA—	SAME	RUNWAY SAFETY AREA
—OFZ—	SAME	OBSTACLE FREE ZONE
——	SAME	NAVAID CRITICAL AREA
——	SAME	RUNWAY PROTECTION ZONE
	SAME	GROUND CONTROL LINE
12│7 13│18	SAME	SECTION CORNER
——	SAME	HOLD BAR
——	SAME	FENCE
⚑	SAME	WINDSOCK
⊗	SAME	AIRPORT REFERENCE POINT

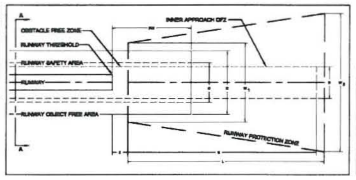
Legend

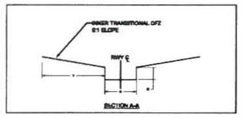
EXISTING	FUTURE	DESCRIPTION
NONE	▬	APM ALIGNMENT ELEVATED/SURFACE
NONE	▬	APM ALIGNMENT TUNNEL
NONE	🟥	APM STATION
▨	SAME	AIRPORT PARKING
NONE	▨	AIRPORT PARKING TO BE REMOVED
🟩	▭	PARKING STRUCTURE
NONE	▨	PARKING STRUCTURE AND TERMINAL
NONE	▩	PARKING STRUCTURE TO BE REMOVED
▨	SAME	EMPLOYEE PARKING
NONE	▨	EMPLOYEE PARKING TO BE REMOVED
▭	▨	APRON
🟨	SAME	RUNWAY PAVEMENT
NONE	▨	AIRFIELD PAVEMENT
NONE	▒	CARGO SUPPORT
NONE	▨	AVIATION SUPPORT
▭	SAME	COMMUNITY NOISE RDUCTION PROGRAM AREA
▭	SAME	WATERWAYS



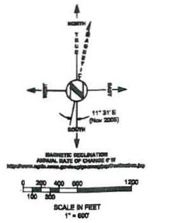
RUNWAY SURFACES TABLE

RUNWAY	APPROACH VISIBILITY MINIMUMS (RVR)	AIRCRAFT GROUP	END EL. (MSL)	RSA		OFA		RPZ				OFZ			
				C	P	Q	R	W_1	W_2	L	Z	D	G	H	Y
8	1/2 mi	D-V	1111.0	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	[illegible]
26	1/2 mi	D-V	1134.8	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	[illegible]
7L	1/2 mi	D-V	1116.1	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	[illegible]
25R	1 mi	D-V	1134.0	500'	1,000'	800'	1,000'	500'	1,010'	1,700'	200'	n/a	n/a	n/a	n/a
7R	1/2 mi	D-V	1110.0	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	[illegible]
25L	1/2 mi	D-V	1128.2	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	[illegible]





SECTION A-A



NON-STANDARD RSA CONDITIONS

DEVIATION DESCRIPTION	STANDARD[1]	EXISTING	RESOLUTION
RUNWAY 25L SAFETY AREA LENGTH BEYOND RUNWAY END	1000'	750'	PENDING FAA DETERMINATION[2]

[1] AC 150/5300-13

[2] SEE FAA LETTER OF VIEW

REV. NO.	DRAWN	CHK'D	APP'D	DESCRIPTION	DATE
				FAA APPROVAL	1/25/94
				FAA APPROVAL	5/9/01
				CURRENT SUBMISSION	11/23/05

Aviation Director (or Designee)

Date:________

Airport Approval Block

FAA Disclaimer

The contents of this plan do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

FAA Approval Block

Phoenix Sky Harbor International Airport (PHX)
Phoenix, Arizona

Future Airport Layout Plan

City of Phoenix, Aviation Department - November 2005

DRAWN BY: DMJM/HDR	PREPARED BY: RICONDO & ASSOCIATES, INC.
DRAWING No.	SHEET 4 OF 18

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Existing Facilities and Proposed Developments

FIGURE
S-4

TABLE S-1
PURPOSE AND NEED SUMMARY

Proposed Action	Description of Proposed Project	Purpose and Need
Demolition of Terminal 2 and Ancillary Facilities	Demolition of existing Terminal 2 and associated facilities.	To more efficiently accommodate future aviation demand and improve the safety and efficiency of on-airport roadways.
Develop the West Terminal	A 33-gate facility located west of the existing Terminal 3. Terminal would be a multi-level central terminal facility with concourses containing 33 gates. The terminal would include a parking garage and other supporting facilities as required for passenger processing and air carrier operations.	To improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers.
Modifications to Terminal 4, Concourse N4 International Gates	N4 would be modified to better accommodate combined domestic and international operations of America West. Other international operations would be relocated to the new West Terminal.	To improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers.
Develop Crossfield Taxiways "U" and "V"	Construction of two Crossfield Taxiways "U" and "V."	To maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time.
Sky Harbor Boulevard Modifications	Develop new primary airport access roadway system to and from I-10 and Buckeye Road via Sky Harbor Boulevard.	To improve access to the airport and efficiency of the on-airport roadway system.
Develop Stage 2 of the Automated People Mover (APM) System	Stage 2 APM would be constructed from the APM Stage 1 station in Terminal 3 westward to the West Terminal and Rental Car Center (RCC). Stage 2 would also be constructed from the APM Stage1 at the East Economy Parking Garage northward to the Valley Metro Light Rail Transit (LRT) system.	To improve access to the airport and efficiency of the on-airport roadway system.

Source: URS, 2004.

Level 2 Evaluation Criteria: Site Acceptability

The FAA considered a range of sites as the initial step in the alternatives evaluation to determine if other areas adjacent to the airport could effectively and efficiently accommodate terminal facilities having sufficient capacity to meet the projected future demand. Evaluation criteria are listed below.

- Runway configuration and layout,
- Proximity to airfield and runway ends,
- Ability to meet aircraft fleet mix requirements,
- Interstate and regional surface access, and
- Reasonableness.

Based on the above, alternatives for the proposed project were identified and evaluated in consideration of the Level 2 criteria. Those alternatives that met the site acceptability criteria were retained for evaluation with respect to constructability and environmental considerations in the Level 3 screening.

Level 3 Evaluation Criteria: Constructability and Environmental Considerations

The Level 3 analysis examined the constructability and environmental considerations for the alternatives carried forward from the Level 2 evaluation. Constructability issues include factors such as necessity to relocate on-airport facilities, roadway closures or realignments, and disruption of airport operations. Environmental considerations include resource categories having measurable impact to threshold criteria as defined in FAA Order 5050.4A, *Airport Environmental Handbook* and FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*. Those alternatives remaining after the Level 3 evaluation were considered in detail in **Chapter 4.0**, Environmental Consequences, of the FEIS.

ALTERNATIVES SCREENING MATRIX

Table S-2 presents a matrix of the Level 1, 2, and 3 evaluation criteria and the alternatives considered. The results of the screening analysis revealed that only three of the alternatives met the purpose and need criteria established for the Level 1 evaluation. These alternatives were the West Airport Site (Alternative 5), the proposed ADP (Alternative 6), and development of new terminal facilities at the north airport site (Alternative 8). Two alternatives (ADP and North Airfield Site) met the Level 2 evaluation criteria. Of these alternatives, only the ADP Alternative met the Level 3 evaluation criteria of constructability and environmental considerations. Based on this analysis, the ADP Alternative and the No-Action Alternative were retained for further detailed analysis in **Chapter 4.0**, Environmental Consequences, of the FEIS. Although the No-Action Alternative would not meet the stated purpose and need for the proposed project, it was retained for detailed analysis in the EIS for comparative purposes, to fulfill CEQ regulations (40 CFR Part 1502) implementing NEPA, and to comply with FAA Order 5050.4A and FAA Order 1050.1E.

TABLE S-2
THREE-LEVEL ALTERNATIVES SCREENING ANALYSIS

Evaluation Level	Evaluation Criteria	Alt. 1 New Airport	Alt. 2 Other Airports	Alt. 3* No - Action* Alternative	Alt. 4 South Airfield Site	Alt. 5 West Airport Site	Alt. 6 Central Core Sites Airport Development Program	Alt. 7 Central Core Sites Expansion of Existing Facilities	Alt. 8 North Airfield Site
Level 1 Purpose and Need	Improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers.	No	No	No	No	Yes	Yes	No	Yes
	Maintain safety and Improve efficiency of aircraft ground movements.	No	No	No	Yes	Yes	Yes	No	Yes
	Improve access to the airport and efficiency of the on-airport roadway system.	No	No	No	Yes	Yes	Yes	No	Yes
Continue to Level 2? Yes or No		**No**	**No**	**Yes**	**No**	**Yes**	**Yes**	**No**	**Yes**
Level 2 Site Acceptability	Runway Configuration and Layout			Yes		No	Yes		Yes
	Proximity to Airfield and Runway Ends			Yes		No	Yes		Yes
	Ability to Meet Aircraft Fleet Mix Requirements			No		Yes	Yes		Yes
	Interstate and Regional Surface Access			Yes		Yes	Yes		Yes
	Reasonableness			No		No	Yes		Yes
Continue to Level 3? Yes or No				**Yes**		**No**	**Yes**		**Yes**
LEVEL 3 Constructability and Environmental	Land acquisition (acres)			0			16		250
	Relocations: Residential (number)			0			0		39
	Commercial/Industrial (acres)			0			16		88
	Infrastructure impacts			No			Yes		Yes
	Maintenance of airport operations			Yes			Yes		Yes
	Section 303(c) sites: direct (#of sites)			0			0		0
	Historic resources: direct (#of sites)			0			0		0
	Wetland impacts (acres)			0			0		0
	Floodplain impacts (acres)			0			Yes		Yes
	Hazardous materials/site contamination			No			Yes		No
Analyze in Chapter 4: Environmental Consequences?				**Yes**			**Yes**		**No**

* No-Action Alternative will be retained for detailed analysis for baseline comparative purposes and to fulfill CEQ regulations, Sections 1502.14 and FAA Orders 5050.4A and 1050.1E implementing NEPA.

Source: URS Corporation, 2004.

AFFECTED ENVIRONMENT

A comprehensive inventory of the existing natural, physical, and social environmental conditions within the FEIS study areas (Generalized Study Area - GSA and Detailed Study Area - DSA) was performed and is contained in **Chapter 3.0**, Affected Environment. The inventory and evaluation of the existing environment provided the groundwork necessary to determine the potential impacts of FAA approval of the proposed Airport Development Program, which were accomplished as part of the environmental consequences analysis.

The proposed West Terminal would be constructed west of Terminal 3 at the location of the existing Terminal 2. This site is located in the central core of the airport along Sky Harbor Boulevard, between Runway 8/26 and Runway 7L/25R.

ENVIRONMENTAL CONSEQUENCES

A detailed environmental analysis of the potential environmental impacts resulting from the construction and operation of the ADP Alternative and the No-Action Alternative at PHX was accomplished by the FAA as part of the FEIS. The following alternative scenarios were examined.

No-Action Alternative: Under the No-Action Alternative, the proposed West Terminal Complex and associated improvements would not be developed. Terminals 2, 3, and 4 would continue to serve as the only passenger processing facilities at PHX. The No-Action Alternative would require the conversion of Terminal 2 to an airfield bus terminal to serve remote aircraft parking positions. This facility would have no contact gate positions and would be renovated internally, to the extent practicable, to provide increased passenger processing. Busing operations could potentially subject passengers to temperatures above 100^0 F during much of the year when transferring between the terminal and aircraft. Crossfield taxiways "U" and "V" and Stage 2 of the APM would not be constructed. Sky Harbor Boulevard would not be realigned or improved.

Airport Development Program (ADP) Alternative: The ADP Alternative would replace the existing Terminal 2 and provide for the construction of a new West Terminal and associated improvements at PHX. The associated improvements include:

- Demolition of Terminal 2 and Ancillary Facilities;
- West Terminal Development (33-gate terminal), Garage, and Terminal Roadways;
- Modifications to Terminal 4, Concourse N4 International Gates;
- Construction of Crossfield Taxiways Uniform "U" and Victor "V;"
- Sky Harbor Boulevard Modifications; and
- Construction of Stage 2 of the Automated People Mover System (APM).

The year 2015, examined for the No-Action and ADP Alternative, is projected to be the first year that the West Terminal Complex and associated developments would be operational and represents the study year for the FEIS.

AIR QUALITY

Maricopa County is currently designated by the U.S. Environmental Protection Agency (EPA) as "nonattainment" for the following criteria air pollutants: ozone (O_3) 8-hour standard and particulate matter (PM_{10}). These designations signify that the air quality in this area does not meet the National Ambient Air Quality Standards (NAAQS) and that a State Implementation Plan (SIP) is in place to bring the area into compliance. The area recently met the NAAQS for carbon monoxide (CO) and ozone 1-hour standard and was redesignated attainment/maintenance. Maricopa County is in attainment of the $PM_{2.5}$ and three other EPA criteria air pollutant standards (NO_2, SO_x, and Pb).

When compared to baseline (2001) conditions, the total amounts of air emissions at PHX are expected to increase in the future (2015), with or without the proposed improvements. This outcome is based on an air quality analysis conducted for airport sources of emissions and is largely attributable to the forecasted increased aircraft operations at PHX over the same timeframe.

However, under the future ADP Alternative, total operational emissions are expected to be less than that expected for the future year No-Action Alternative. This is primarily due to the improved airfield operating characteristics, reduced delay times, and the projected reduction of aircraft hardstand operations in the terminal area. A temporary increase in air emissions associated with the construction of the ADP Alternative would occur.

The sum of project-related construction and operational emissions for each year, from 2008 through 2015, are all below the *de minimis* thresholds of the General Conformity Rule. As a result, the General Conformity Rule does not apply and no further demonstration is required to show that the ADP Alternative conforms to the SIP. Since there are no roadway improvements connected with the ADP Alternative, which are funded or approved by the Federal Highway Administration (FHWA)/Federal Transit Authority (FTA), the Transportation Conformity Rule also does not apply. Hazardous Air Pollutants (HAPS) have also been addressed in the FEIS.

COASTAL RESOURCES

There are no areas within Maricopa County or the State of Arizona that have been designated as coastal zones pursuant to the Coastal Zone Management Act of 1972 (CZMA). Arizona does not have an approved Coastal Zone Management Plan. No portion of Maricopa County is included as a designated unit within the Coastal Barrier Resources System. Therefore, it was concluded that implementation of either the ADP Alternative or the No-Action Alternative would not result in impacts within either coastal management zone or coastal barrier resources.

COMPATIBLE LAND USE

Under the No-Action Alternative, there would be no changes in off-airport land use within the study area other than those resulting from the continuation of routine airport operations. There would be no increase or change in the level of impacts to off-airport land use in the area.

The proposed improvements associated with the ADP Alternative would have a minor effect upon off-airport land use. Most of the improvements associated with the proposed ADP Alternative would be constructed on airport property. Development of the APM Stage 2 and the connection to the LRT and APM maintenance facility would require the acquisition and conversion of approximately 16.4 acres of privately held property to airport use. The project site is surrounded by other airport, commercial and light industrial land uses. Noise levels due to the improvements would not differ at all as compared to the No-Action Alternative and are not expected to result in new noise impacts to noise sensitive areas. Changes to land use would be minimal and result from the conversion and redevelopment of existing facilities to airport uses. This conversion could affect prehistoric Hohokam archaeological sites [Pueblo Grande/AZ U: 9:1(ASM) and AZ U: 9:28(ASM)] that are eligible for the National Register for their potential to yield important information (Criterion D). Those impacts would be addressed in accordance with a Section 106 Memorandum of Agreement (MOA). The conversion also may need to address some areas of existing environmental contamination. For additional information on these resources, see discussion under the Historical, Architectural, and Cultural, and Hazardous Materials sections of this Executive Summary, respectively.

CONSTRUCTION IMPACTS

Under the No-Action Alternative, there would be some construction-related impacts relating to renovation and conversion of Terminal 2 to accommodate remote gate hardstand operations. The No-Action Alternative construction impacts in Terminal 2 include a short-term increase in solid waste production and hazardous waste generation resulting from asbestos abatement. Construction impacts resulting from the implementation of the proposed project at PHX would include temporary and unavoidable impacts related to noise, air quality, water quality, solid waste, hazardous waste, and traffic congestion. These impacts would be temporary and would be minimized through the establishment and use of environmental controls (such as Best Management Practices (BMPs)) and adherence to Federal, state and local construction guidelines. All on-airport construction activities would adhere to FAA Advisory Circular (AC) 150/5370-10B, *Standards for Specifying Construction at Airports*, and Federal, State, and local permitting requirements for construction activities. All contractors performing work at the airport are required to comply with the City of Phoenix AZPDES Construction General Permit. The City of Phoenix Aviation Department performs routine surveillance during construction to document this compliance. Special provisions will be included in the construction document to address the potential for encountering hazardous materials. All applicable Federal, state and local regulations will be followed for the cleanup and disposal of hazardous waste during construction activities. In addition, contractors will be required to maintain a "Spill Response Kit" on the project worksite. The kit would include materials such as absorbent materials, absorbent pads, shovels, and storage containers. These kits would be used as a first response to mitigate the spread of hazardous materials should a spill occur.

DEPARTMENT OF TRANSPORTATION SECTION 4(f)

Under the No-Action Alternative there would be no use of Section 4(f) resources.

The ADP Alternative would not directly or constructively use any publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance. Although the ADP Alternative does have the potential to impact land of a historic site of national, state, or local significance, the ADP Alternative would not result in a physical or constructive use to any of these sites. Six historic Section 4(f) resources were identified within the area of potential effects of the ADP Alternative. If the ADP Alternative were selected, *The Phoenix*, a historic mural by Paul Coze installed in the Terminal 2 lobby, would be removed before the terminal is demolished, and be mounted elsewhere in a public space on the airport. The mural is owned by and would remain in the ownership of the City of Phoenix. The relocation of the mural would not substantially impair its values as a historic art object and not constitute a Section 4(f) physical or constructive use.

The Stage 2 - East APM would cross beneath the historic Phoenix main line of the Southern Pacific Railroad using the existing bridge that carries the railroad over the depressed Sky Harbor Expressway (SR 153). The Stage 2 - East APM would span the historic Grand Canal on an elevated structure. The project would not acquire land from the canal or railroad right-of-way and would not substantially diminish their historic values and ongoing uses. Therefore, the crossings of the canal and railroad would not be a Section 4(f) physical or constructive use.

The elevated sections of the Stage 2 - East APM facilities would be visible from the historic Sacred Heart Church, Tovrea Castle, and the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park. The Sacred Heart Church is about one-half mile from the closest proposed elevated section of the Stage 2 APM, and the Tovrea Castle is about one mile away. The project would not substantially alter the settings of these properties. The northern elevated section of the Stage 2 - East APM guideways, station, and the APM maintenance and control facility would be within 250 to 1,000 feet of the western edge of Pueblo Grande Museum and Archaeological Park. Sensitive design of elevated portions of the Stage 2 - East APM facilities in the vicinity of the park would minimize any incompatible visual intrusions and avoid any substantial impairment of the use of the park. The FAA in consultation with the SHPO determined that a sensitive and compatible design would avoid adverse visual effect to the Pueblo Grande Museum and Archaeological Park. The ADP Alternative would not result in a Section 4(f) physical or constructive use of the Sacred Heart Church, Tovrea Castle, or Pueblo Grande Museum and Archaeological Park.

FARMLANDS

The No-Action Alternative would not impact farmlands protected by the FPPA because there would be no new construction or development activities relating to the proposed project. There is no farmland designated by the Natural Resource Conservation Service (NRCS) as prime or unique farmlands or otherwise protected by state or local agencies within the DSA. Therefore, none of the improvements associated with the ADP Alternative would affect protected farmlands.

FISH, WILDLIFE AND PLANTS

Under the No-Action Alternative there would be no construction or development activities relating to the proposed project. Therefore, there would be no impacts to biotic communities at the airport.

The potential impacts to biotic communities within the DSA resulting from the ADP Alternative were evaluated through field observations and by comparing aerial photographs of the DSA to detailed schematics of the alternatives. Within the DSA, no threatened or endangered species occur. Additionally, there are no native plant communities associated with the area of disturbance and therefore no significant vegetative impact. No significant impacts to the biotic communities would result from the ADP Alternative.

FLOODPLAINS

Under the No-Action Alternative, there would be no development activities associated with the proposed project. Therefore, there would be no impacts to designated floodplains.

For the ADP Alternative, potential floodplain encroachment is anticipated by the construction of the Stage 2 APM near the Grand Canal. The APM structure will be elevated above the floodplain, however, some piers and support infrastructure may be located in a 100-year floodplain. A review of potential impacts concludes that the encroachment would not be significant and no Federal finding is required. Mitigation measures may be implemented during the design and local approval process to minimize impact. No significant floodplain impact is expected.

HAZARDOUS MATERIALS AND SOLID WASTE

Under the No-Action Alternative, modifications to Terminal 2 would be required to support remote gate and hardstand operations. The Terminal 2 modifications would require demolition and renovation activities in areas contaminated with asbestos containing materials (ACM). As part of the Terminal 2 No-Action Alternative, the City (or subcontractor) would prepare and implement an asbestos abatement program. This program would be developed in full compliance with applicable Federal, state and local regulations including Section 112 of the CAA and Arizona Administrative Code R18-2-1101.

The airport area planned for development of the ADP Alternative has been documented to contain environmental contamination resulting from activities associated with past land uses on or in the vicinity of the airport. The two known areas of environmental contamination in the vicinity of the proposed West Terminal are subsurface fuel plumes located in the vicinity of Terminal 2 and the former West Sky Harbor Fuel Facility. The nature of the contamination at these sites is well documented, and programs are in place or planned for the recovery and treatment of contaminated materials (e.g., fuel, soil, and groundwater). As an integral part of the ADP Alternative design process, procedures would be developed to avoid disturbance of the ongoing remediation programs in the fuel plume areas. Applicable pollution control measures will be implemented, as appropriate, during the project design phase, to address, if necessary, the potential for migration of gases into the built structures.

Construction of the APM Stage 2 would require the City to purchase approximately 16 acres of privately held property in, and adjacent to, the APM right-of-way. The Motorola 52nd Street/Honeywell 34th Street Facility National Priorities List (NPL) site is located in the vicinity of the proposed APM Stage 2. A Corrective Action Plan for the Honeywell 34th Street facility was approved by the ADEQ on October 7, 2005. The potential for environmental contamination in the proposed APM Stage 2 acquisition area from the NPL site has not been determined. Due diligence audits and site surveys would be performed to verify the status of the property prior to acquisition or other activities associated with the proposed ADP project.

During construction of the West Terminal and associated projects, or Terminal 2 renovations under the No-Action Alternative the contractors would use various forms of materials on a temporary basis that are classifiable as hazardous or are otherwise regulated. Consisting primarily of fuels and other petroleum-based products, these materials would be stored, transported, and disposed of in accordance with applicable regulations and BMPs. The City of Phoenix has committed they will perform all ADP development activities in full compliance with all applicable Federal, state and local regulations.

The ADP Alternative would result in a temporary increase in construction and demolition waste at PHX. This would not significantly impact the ability of area landfills to accommodate this increase in capacity demand. The ADP Alternative has the potential to increase solid waste generation resulting from an increased availability of concessions and other passenger amenities in the new West Terminal. Neither the No-Action Alternative nor the ADP Alternative would result in a significant impact to regional landfill capacity or activities leading to an increased bird strike potential at PHX.

Any construction activities that involve disturbance of the surface have the potential to expose and release previously unknown hazardous materials and wastes that may be located in the vicinity. In the event of a spill or unanticipated release of regulated materials including fuels, contractors will be required to cease work in the immediate area and report the release to the National Response Center (NRC). As part of the ADP project construction specifications, special provisions will be included in the construction document to address the potential for encountering hazardous materials. All applicable Federal, state and local regulations will be followed for the cleanup and disposal of hazardous waste during construction activities.

HISTORIC, ARCHITECTURAL, AND CULTURAL

There would be no impacts on historic, architectural, archaeological, or cultural resources associated with the No-Action Alternative. The ADP Alternative would result in construction activities that may affect historic properties eligible for the National Register of Historic Places and the proposed facilities could modify their visual settings.

Construction impacts of the ADP Alternative on three historic properties, including: 1) *The Phoenix*, a mural by Paul Coze installed in the Terminal 2 lobby, 2) the Grand Canal, and 3) the Phoenix Main Line of the Southern Pacific Railroad, are not considered adverse. The ADP Alternative could disturb parts of three large prehistoric Hohokam archaeological sites (Pueblo Salado, Dutch Canal Ruin, and Pueblo Grande), which may have associated human remains and funerary objects that are of concern to affiliated

tribes. In addition, two other archaeological sites [AZ U:9:2 and 26(ASM)], where buried remnants of 19 Hohokam canals and the 1884 Joint Head Canal have been recorded, as well as other canals of the Hohokam irrigation canal Systems 2 and 10, also could be disturbed by construction activities. Modern development has masked those archaeological sites and the locations, condition, and extent of potential impacts are ambiguous, but disturbance of intact deposits that have potential to yield information would be an adverse effect. The project also has potential to adversely affect the visual setting of the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park.

The ADP Alternative would result in the FAA continuing to inventory, evaluate, and assess effects in accordance with a Section 106 Memorandum of Agreement. There is potential to satisfactorily mitigate adverse effects on archaeological sites by conducting studies to recover and preserve important information before they are disturbed. If associated human remains were found, they would be treated and repatriated in accordance with a 1995 burial agreement that the City of Phoenix has executed to comply with the Arizona Antiquities Act. A copy of the burial agreement is provided in **Appendix C** of this FEIS.

The FAA and Phoenix Aviation Department would avoid potential visual effects on the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park through sensitive design of the Stage 2 - East APM facilities. The Museum Director, Phoenix CHPO, and SHPO would be involved in defining design criteria and reviewing developing designs of the Stage 2 - East APM station and maintenance facility. The FAA concluded, in consultation with the SHPO, that a sensitive design of the proposed facilities considering factors such as massing, style, color, texture, glare and potential for screening with vegetation, would have no adverse effect on the Pueblo Grande Museum and Archaeological Park. Future consultation between the FAA, Director of the Pueblo Grande Museum and Archaeological Park, City of Phoenix Archaeologist, City of Phoenix Historic Preservation Officer, and SHPO will occur throughout the design process to ensure that a sensitive design/compatible design will avoid adverse effects to Pueblo Grande Museum and Archaeological Park. The project has potential to result in a beneficial effect by enhancing public awareness of the Pueblo Grande Museum and Archaeological Park and enhancing pedestrian access from the APM and Valley Metro Rail stations.

LIGHT EMISSIONS AND VISUAL IMPACTS

The No-Action Alternative would not result in any additional impacts to light sensitive areas in the year 2015. The No-Action Alternative assumes that the ADP would not be constructed and that no additional visual impacts would occur.

Implementation of the ADP Alternative would result in additional light emissions; however, these emissions are not expected to result in a significant visual impact to off-property areas in the general vicinity of PHX. Impacts would comply with Section 23-100 of the Phoenix city code. The ADP Alternative and associated developments are common features of an international airport and urban area such as the City of Phoenix.

Development of the APM Stage 2 maintenance facility and APM/LRT station, to be located near the southwest corner of Washington and 44th Streets, could be visible from sensitive offsite cultural resources such as the Pueblo Grande Museum and Tovrea Castle property. However, the City will be required to coordinate with the State Historic Preservation Officer, the City of Phoenix Historic Preservation Officer, and other interested parties, to incorporate resource sensitive design concepts into the APM Stage 2 such that potential impacts to offsite resources would be minimized.

NATURAL RESOURCES AND ENERGY SUPPLY

The number of aircraft operations at PHX would be the same for the No-Action Alternative and the ADP Alternative through the 2015 study period. When compared to the No-Action Alternative, the consumption of aviation fuel is expected to decrease slightly due to lower aircraft taxi delays associated with the improved airfield and terminal efficiency from the proposed crossfield taxiways and terminal facilities.

Demand for electrical and heating energy would increase approximately 21 percent with the implementation of the ADP Alternative due to the increased square footage of the West Terminal Complex over existing Terminal 2 and development of additional lighted airfield surfaces. However, this demand for fuel and electrical power can be met without resulting in significant impacts to the region's energy supply, distribution networks and infrastructure. Design of the ADP Alternative would incorporate systems to reduce electrical and heating energy demand. These systems could include the use of solar technology and other technologies as determined to be prudent and feasible with respect to construction cost and operational reliability.

There are no known sources of mineral or energy resources in the DSA that would be adversely affected by the ADP Alternative. Development of any of these alternatives would not require the use of unusual materials or those that are in short supply in the Phoenix region.

NOISE

An evaluation of the potential of the proposed ADP Alternative to result in noise impacts was performed. This evaluation determined that there would be no change in aircraft operations between the No-Action and ADP Alternatives. Therefore, there would be no change in the noise exposure contours for the ADP Alternative when compared to those for the No-Action Alternative. Accordingly, there would be no significant aircraft noise impacts (increase in 1.5 dB within the 65 DNL contour) as a result of the ADP Alternative. In terms of possible impacts to land uses, in 2015 off-airport acreage impacts would include approximately 243 acres of residential land use within the 65 Day-Night Average Sound Level (DNL) contour for both the No-Action Alternative and the ADP Alternative.

It should be noted that, a revision was made to the flight track data presented in the DEIS for both the No-Action and ADP Alternatives 2015 noise analysis to reflect the suspension of the Runway 25L Side-Step Procedure. On March 27, 2002, following the failure of the flight check of the Side-Step Procedure it was suspended. The Side-Step Procedure was replaced with a straight-in Visual Approach to Runway 25L. In order to accurately depict and evaluate potential noise impacts resulting from the proposed project, the

noise analysis presented in the DEIS was reevaluated. The noise exposure contours were re-run using the INM Version 6.1 model and are presented in the FEIS. An assessment of the noise contours between the Side-Step and straight-in flight tracks indicates no change in the 2015 noise contour. The straight-in flight tracks are illustrated in **Figure B-1-21**, **Figure B-1-22**, and **Figure B-1-23** of the FEIS. Results of the No-Action and ADP Alternative noise analysis are presented in **Section 4.14.3** of the FEIS.

SECONDARY (INDUCED) IMPACTS

Under the No-Action Alternative, no new facilities associated with the ADP Alternative would be constructed. Therefore, there would be no significant secondary (induced) impacts.

Implementation of the ADP Alternative would not result in shifts in population movement and growth, changes in public services demands, significant changes in business and economic activity or appreciable change in employment.

SOCIOECONOMIC, ENVIRONMENTAL JUSTICE, AND CHILD HEALTH

No off-airport construction/development activity would occur under the No-Action Alternative; therefore, residents would not be relocated and established communities and planned development would not be disrupted. A decrease in the level of service for Sky Harbor Boulevard would occur over time as operations at PHX increase and in response to population growth in the City of Phoenix and surrounding communities.

The ADP Alternative would result in socioeconomic impacts including property acquisition, business relocations, and alteration of surface transportation patterns. Approximately 16.4 acres of land located within the acquisition area consisting of 92 parcels would be acquired. Many of the parcels have been consolidated with other lots by buildings or other improvements that span multiple lot boundaries (DMJM Aviation/HDR, 2004c). Within the acquisition area, there are a total of 14 property owner-operated businesses (including two billboards) that would require relocation. These owner-run businesses are characterized as industrial and commercial distribution, supply, and service (DMJM Aviation/HDR, 2004c). None are known or expected to have specialty products or a customer base that is dependent upon the unique particulars of location at this site. Relocation of these businesses would not create any economic hardship for the local communities. Land owners impacted by the acquisition would be compensated in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended. In addition to the owner-run businesses, there are 17 tenant-run businesses in the acquisition area that would need to be relocated. A review of land use and land availability within the GSA in the vicinity of PHX indicates that sufficient property is available within the vicinity of PHX to support relocation of those displaced. Realignment of Sky Harbor Boulevard on airport property would ease traffic congestion and shorten transit time on this roadway. The APM Stage 2 would relieve some roadway congestion. No significant off-site roadway impacts are expected. Neither alternative would result in environmental justice impacts nor affect children's health and safety. The relocation of businesses would be performed in accordance with the Uniform Relocation Assistance Real Property Acquisition Policies Act of 1970. There would be no adverse impact to children's health as a result of the proposed ADP Alternative construction. Most of the construction activities would be accomplished on-site.

Following construction, there would be some improvement in air quality surrounding the airport due to reduced aircraft taxi time, improved roadway conditions, and availability of the Stage 2 APM.

WATER RESOURCES

Under the No-Action Alternative, water use and the generation of wastewater would increase from 2001 levels in response to the forecast increase in aircraft operations and enplanements. The increase in aircraft operations would result from the ongoing population and economic growth of the Phoenix/Maricopa County Area. During 2004, water use at the airport in support of terminal/passenger operations totaled 130.94 million gallons with an enplanement total of 19.75 million passengers. Water use will increase to approximately 168.52 million gallons per year (mg/yr) in 2015 in response to the increase in enplanements which are forecast to be over 25 million passengers in 2015.

As to impacts of the ADP implementation, the construction of new terminal facilities, demolition of existing structures, realignment of roadways, and change of aprons and taxiways would change the use of water and generation of wastewater at the airport. The increase in impervious surfaces resulting from the construction of these projects could also increase the generation of stormwater runoff at the airport.

The 2015 rate of water consumption in terminal facilities at PHX following construction of the ADP Alternative is estimated to be approximately 185.41 million gallons/year. This is a 16.9 million gallon/year increase over the projected 2015 consumption rate for terminal facilities of 168.52 million gallons/year. This volume does not include the operational water requirements of running support infrastructure such as the demand for fire protection systems, vehicle maintenance, and other airport operations.

Flooding has historically been a problem in the Salt River Valley, and PHX is required to maintain and operate a stormwater collection and discharge system that can accommodate short duration/large rainfall intensities and runoff volumes. The Aviation Department was issued an AZPDES General Permit from ADEQ on February 28, 2003. PHX's stormwater management plan is compliant with state and Federal stormwater standards and there have not been any regulatory actions or incidents over discharges to the Salt River associated with operations at PHX. The existing facilities, when operated in compliance with the City's approved Stormwater Pollution Prevention Plan (SWPPP) would minimize the potential for stormwater impacts.

WETLANDS

No wetlands exist within the proposed detailed study areas for the No-Action and ADP Alternatives. The Salt River borders PHX to the south and east. The Grand Canal borders PHX to the north and east. Wetlands or other riparian habitats are found within the bed of the Salt River. No proposed construction activities are planned within the riverbed under either the No-Action or ADP Alternatives; therefore, no impacts to these resources are anticipated and no mitigation would be warranted. There are no wetland habitats associated with the Grand Canal. The Grand Canal is in an urbanized development area. The canal consists of an open concrete culvert structure. Flows in the canal are seasonal and highly variable.

WILD AND SCENIC RIVERS

Review of information provided by the U.S. Department of Interior's Inventory of Wild and Scenic Rivers indicates that there are no designated Wild and Scenic Rivers within 1,000 feet of the DSA. There is only one Wild and Scenic River in the State of Arizona, a portion of the Verde River located about 100 miles north of the City of Phoenix. Therefore, neither the No-Action Alternative nor the ADP Alternative would impact a designated Wild and Scenic River.

SURFACE TRANSPORTATION

A surface transportation analysis for the No-Action Alternative indicates the future increase in daily passenger traffic and employee and service traffic would result in high to severe levels of congestion on Sky Harbor Boulevard during peak traffic periods, with several intersections having a level of service "F" rating. Cut-through traffic volumes and system deficiencies would continue to increase, resulting in higher levels of congestion and intersections operating at unacceptable levels of delay in 2015. Without the realignment of Sky Harbor Boulevard, increased congestion from slower traffic and/or stop and go traffic would increase air emissions.

The surface transportation improvements proposed under the ADP Alternative would generally improve the overall transportation system in the vicinity of PHX. Realignment of Sky Harbor Boulevard would disperse traffic volumes over several roadways and lessen the impact on Sky Harbor Boulevard compared to the No-Action Alternative. Cut-through traffic volumes and system deficiencies due to development and population growth would continue to increase in the vicinity of PHX. However, the realignment of Sky Harbor Boulevard, in conjunction with development of the APM Stage 2, would decrease congestion, improve traffic flow, and reduce shuttle bus vehicle miles traveled on the roadway when compared to the No-Action Alternative.

OTHER CONSIDERATIONS

Consistency with Plans, Goals, and Policies

The ADP Alternative would not conflict with the objectives of Federal, regional, state, or local land use plans, policies, or controls for the City of Phoenix area. The ADP Alternative is consistent the City of Phoenix General Plan adopted by City Council Resolution on December 5, 2001. The City of Phoenix General Plan characterizes land use in the acquisition study area as industrial and the area is zoned as about 70 percent industrial and 30 percent light industrial. Development of the APM Stage 2 East connection to the LTR and APM maintenance facility would reflect a land use change, at least in part, to transit/public-quasi public, consistent with the PHX area and light rail along Washington Street. The land use change would be minor and consistent with the City of Phoenix LRT development plans (City of Phoenix, 2004). The City of Phoenix has provided the required Land Use Assurance Letter to the FAA to ensure that the projects are consistent with plans for development in the local area (see **Appendix A**). MAG, the designated Metropolitan Planning Organization for the Phoenix metropolitan area, has reviewed the proposed ADP project at PHX and has included development of the ADP project in their preferred alternative for addressing the future aviation needs of the Phoenix area (see **Appendix A**).

The proposed ADP Alternative is consistent with development goals of the City of Tempe. The City of Tempe General Plan 2030 recognizes that PHX is an economic development, tourism, and marketing asset to Tempe. The Plan also identifies PHX as contributing to air quality degradation and noise pollution in the northern half of the city. The ADP Alternative would not change off-site noise impacts resulting from aircraft operations, as compared to the No-Action Alternative. The forecast number of aircraft operations with the No-Action Alternative and ADP Alternative are the same. The ADP Alternative would facilitate the multi-modal movement of airport traffic, provide continued service to businesses and residents as a critical component of the regional transportation system, and support the orderly planned growth and development of the Phoenix/Maricopa County area. As a result of the improved efficiency in aircraft operations on the airport's taxiway system, and the use of the APM, onsite air emissions from the airport would be reduced.

Inconsistency with Local Plans and Laws

The ADP Alternative is consistent the City of Phoenix General Plan adopted by City Council Resolution on December 5, 2001. The City of Phoenix has provided the required Land Use Assurance Letter to the FAA to ensure that the projects are consistent with plans for development in the local area (see **Appendix A**). MAG, the designated Metropolitan Planning Organization for the Phoenix metropolitan area, has reviewed the proposed ADP project at PHX and has included development of the ADP project in their preferred alternative for addressing the future aviation needs of the Phoenix area (see **Appendix A**).

The proposed ADP Alternative is consistent with development goals of the City of Tempe. The City of Tempe General Plan 2030 recognizes that PHX is an economic development, tourism, and marketing asset to Tempe. The Plan also identifies PHX as contributing to air quality degradation and noise pollution in the northern half of the city. The ADP Alternative would not change off-site noise impacts resulting from aircraft operations, as compared to the No-Action Alternative. The ADP Alternative would facilitate the multi-modal movement of airport traffic, provide continued service to businesses and residents as a critical component of the regional transportation system, and support the orderly planned growth and development of the Phoenix/Maricopa County area. As a result of the improved efficiency in aircraft operations on the airport's taxiway system, and the use of the APM, onsite air emissions from the airport would be reduced.

The ADP Alternative is consistent with the existing ALP and the intent of local planners to ensure the development of compatible land uses in the PHX area.

Degree of Controversy

The FAA has conducted Agency and Scoping Meetings as well as a Public Information Workshop. A total of 10 persons registered for the Public Scoping Meeting and 9 persons registered for the October 16, 2002 Public Information Workshop. Public Workshop Meetings and Public Hearings occurred after the release of the DEIS. There were 19 registered participants at the July 12, 2005 meeting/hearing and five registered participants at the July 13, 2005 meeting/hearing. During the comment period for the DEIS, a total of 67 comments were received from the public and regulatory agencies.

Unavoidable Adverse Impact and Irreversible Commitment of Resources

The construction and operation of the ADP Alternative would result in the use of resources and have environmental impacts that are unavoidable. The impacts associated with proposed improvements are disclosed for specific impact categories in this FEIS. None of the impacts are considered to be significant. Mitigation for impacts associated with those categories affected by the proposed actions is presented in the FEIS. The No-Action Alternative would not result in the unavoidable use of resources or environmental impacts.

Man's Relationship Between Local Short-Term Uses of His Environment and Enhancement of Long-Term Productivity

The ADP Alternative would require use of the environment to achieve the long-term goal of improving the efficiency of landside passenger handling facilities to accommodate forecast demand. Minor, short-term traffic delays; fugitive dust and increased emissions from construction vehicles; and additional construction noise would occur as a result of the proposed action. These short-term impacts would be minimized through the establishment and use of environmental controls, such as BMPs and Federal, state, and local construction guidelines.

The FAA's purpose and need for the proposed action is to 1) meet the needs of the National Airspace System, 2) improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers (LFA, 2003), 3) maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time, and 4) improve access to the airport and the efficiency of the on-airport roadway system. Long-term benefits of the proposed improvements would ultimately be the ability of PHX, as one of the nation's busiest hub airports, to efficiently manage passengers and aircraft operations. The No-Action Alternative would not enhance the long-term productivity of the airport. Short-term uses would not significantly alter the short-term uses of the environment.

MITIGATION

The City currently participates in measures to minimize ongoing effects associated with operational activities at the airport. PHX has air quality emission reduction measures already in place which include the use of efficient layout and design of the runway/taxiway/terminal area systems enabling smooth, swift and uninterrupted movements of aircraft from the runway ends to the terminal/cargo areas; thereby reducing fuel consumption and the resultant emissions. In addition, the airport layout provides an efficient design of the landside infrastructure (e.g., access/egress roadways, terminal area curb front, and on-site parking facilities), which helps to reduce excess emissions associated with slow-moving, idling, and roaming motor vehicles. Layout and design efficiencies associated with the ADP would further improve traffic flow within the airport boundaries.

As documented in the FEIS, there are no significant environmental impacts associated with the ADP Alternative. The ADP Alternative would reduce air emissions at PHX resulting from aircraft engine and

motor vehicle operations. The ADP Alternative would result in non-significant environmental impacts to several resource categories which may, therefore, not require mitigation. However, construction and/or operational pollution prevention methods may be implemented to minimize the potential for any impact. These measures are discussed in the following paragraphs.

Construction Mitigation Measures

As an integral part of the ADP design and construction process, applicable state and local environmental construction controls will be examined to determine their effectiveness in reducing or eliminating impacts associated with construction of the ADP Alternative. The following sections describe potential construction mitigation measures associated with air quality, floodplains, hazardous substances, historic and archaeological resources, socioeconomics, and water resources.

Air Quality

During the construction phases, potential short-term impacts to air quality can be avoided, controlled minimized, and/or compensated for by the adherence to the following measures including but not limited to:

- All construction activities shall be carried out in full compliance with the pollution control provisions and specifications contained in FAA Advisory Circular (AC) 150/5370-10B, *Standards for Specifying Construction of Airports*, the City of Phoenix AZPDES Construction General Permit, and/or required by Maricopa County dust control rules and any local guidelines or ordinances.

- Any required air quality permits for land clearing, earth moving, open burning, asphalt and concrete batch plants, etc. would be obtained by the General Contractor or Subcontractor before the commencement of related activities. The City of Phoenix Aviation Department would monitor compliance with contractor permit conditions. The City of Phoenix has committed in writing to coordinate with Federal, state, and local agencies to assure that all construction activities are performed in compliance with applicable requirements and regulations. A copy of this commitment is contained in Appendix A of the FEIS.

- Stockpiles of soil, dirt, rocks, and other raw materials shall be covered or stabilized by the General Contractor or Subcontractors in compliance with Maricopa County Dust Control Procedures to help prevent the generation of wind-blown particles and debris (e.g., fugitive dust) consistent with the airport's AZPDES permit.

- Heavily used work sites (e.g., construction staging areas, haul roads, loading/unloading platforms) shall be shielded, treated, or otherwise maintained by the General Contractor or Subcontractor in compliance with Maricopa County dust control rules to help prevent the generation and release of dust.

- To the extent feasible, staged construction schedules would be employed by the General Contractor or Subcontractor that would help reduce the exposure of wind-erodable soils to minimal amounts and time periods.

- Construction equipment (e.g., earthmovers, haul trucks, excavators, etc.) to be properly maintained by the General Contractor or Subcontractor to help minimize excess exhaust emissions.

- Temporary degradation in air quality due to emissions from construction equipment, fugitive dust from excavated areas and earth moving operations, will be minimized through the enforcement of the terms and conditions of a Dust Control Permit that will be issued to the contractor by Maricopa County prior to approval for construction.

FLOODPLAINS

As required by FAA and Department of Transportation (DOT) orders, FAA will continue to work with state and local officials to finalize the design of the Automated People Mover System (APM) station to minimize potential harm to or within the base floodplain. The final design must be approved by Maricopa County and in the unlikely event that a significant (>1 foot) elevation change is predicted, the City would have to apply for a letter of map revision and design specific mitigation measures consistent with County requirements.

The ADP Alternative would require plans for the APM to be reviewed by the Maricopa County Flood Control District (MCFCD) with specific attention to the crossing of the Grand Canal. PHX would be required to show that a bridge design would safely accommodate the design flood, withstand the attendant inundation, and perform satisfactorily. PHX would also need to either demonstrate that the structures will be constructed outside of Zone A or avoid a one-foot change in the base flood elevation of the affected area.

The design of the Stage 2 APM and associated station would include consideration of methods to minimize floodplain impacts. This may include, but not be limited to, designing and placing piers and support infrastructure in a manner to minimize restrictions on the flow of flood waters and impacts to floodplain values; minimizing the amount of fill in the floodplain; and elevating facilities above the base flood elevation.

HAZARDOUS SUBSTANCES

Construction of the ADP Alternative would be conducted in areas of the airport that are known to contain environmental contamination. These include two fuel plumes in the vicinity of the proposed West Terminal complex and crossfield taxiways. It is not anticipated that the existing plumes would substantially interfere with the construction process nor is it expected that the project would impede the clean-up process (Hughto, 2004). Construction plans and activities for the ADP Alternative would be developed, as appropriate, to prevent the spreading or migration of contaminants beyond the existing contaminant zones.

The potential risk to construction workers associated with exposures to petroleum-contaminated soils, groundwater, and fumes would be addressed in the planning and design process and construction contract documents. During construction, work would be performed in accordance with the requirements of the Occupational Safety and Health Administration (OSHA). Any additional mitigation measures considered necessary to further reduce the impacts to the environment would be evaluated as the construction plans are developed.

Demolition to Terminal 2 would be complicated by the presence of large amounts of asbestos containing materials (ACM). Removal and proper disposal of these materials would be required. Asbestos abatement activities would be performed in compliance with Section 112 of the Clean Air Act, Arizona Administrative Code R18-2-1101, and all other applicable Federal, state, and local regulations.

Should any additional and unexpected contaminated materials be encountered during the construction process, they would be addressed in accordance with Federal and state regulations. The use of hazardous materials (e.g., solvents, cleaners, coatings, paints, etc.) and other regulated substances (fuel, oil, hydraulic fluids, etc.) by the construction contractors could also be handled, stored, and disposed of following appropriate safeguards, guidelines, and work practices. As appropriate, spill prevention control and countermeasure (SPCC) plans would be developed for the handling and cleanup of potentially hazardous materials. Worker safety training would be conducted in accordance with OSHA 29 CFR 1926 requirements.

Any construction activities that involve disturbance of the surface have the potential to expose and release previously unknown hazardous materials and wastes that may be located in the vicinity. In the event of a spill or unanticipated release of regulated materials including fuels, contractors will be required to cease work in the immediate area and report the release to the National Response Center (NRC). Special provisions will be included in the construction document to address the potential for encountering hazardous materials. All applicable Federal, state, and local regulations will be followed for the cleanup and disposal of hazardous waste during construction activities.

HISTORIC AND ARCHAEOLOGICAL RESOURCES

The ADP Alternative project planning would continue and final designs would be prepared in accordance with procedures defined in the Section 106 Memorandum of Agreement (MOA) between the FAA, City of Phoenix, Bureau of Reclamation, Salt River Project, and State Historic Preservation Officer (SHPO) to address improvements at the airport (an unsigned copy of the MOA is contained within **Appendix C** of the FEIS). The City would arrange to have archaeological testing or monitoring plans prepared and implemented as those final designs provide more details about the components of the ADP Alternative. If archaeological resources are discovered, they would be evaluated and measures to avoid, reduce, or mitigate impacts to National Register-eligible resources would be developed and implemented. Treatment plans would be prepared and are most likely to focus on studies to recover and preserve important archaeological information before significant archaeological resources are disturbed or destroyed by ground-disturbing construction activities. If human remains and funerary objects, sacred objects, or objects of cultural patrimony were encountered in association with archaeological sites, they would be treated and repatriated in accordance with a 1995 agreement that the City of Phoenix executed in compliance with the Arizona State Museum for tribes having traditional cultural affiliations within the Phoenix area. The agreement was developed to ensure that City of Phoenix projects are implemented in compliance with the Arizona Antiquities Act, which governs treatment of human remains and such objects found on lands owned or controlled by the City of Phoenix.

None of the buildings that would be demolished by implementation of the ADP Alternative are listed in or eligible for the National Register. However, *The Phoenix*, a mural by Paul Coze installed within the

Terminal 2 lobby, is considered eligible for the National Register under Criterion C. The ADP Alternative would demolish Terminal 2 and replace it with a new West Terminal. The City would remove and preserve the mural prior to demolition of the terminal. In contrast to a historical building or structure, the mural is an inherently moveable object of art. The FAA, in consultation with the SHPO, has concluded that moving the mural and remounting it to another public location at the airport would not adversely affect the historic values that make the mural eligible for the National Register. Before the Paul Coze mural is removed from Terminal 2, the mural would be photo-documented. The airport art curator would ensure that the mural is carefully removed to avoid damage to the multimedia mural. The Phoenix Aviation Department would remount the three panels of the mural together in an appropriate public location on the airport in a timely manner. The history of the mural would be documented and publicly interpreted when it is remounted. The FAA would consult the SHPO and Phoenix City Historic Preservation Officer (CHPO) as detailed plans for removing and remounting the mural are developed and implemented.

To specifically address potential visual effects on the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park, the FAA and Phoenix Aviation Department would work with the Museum Director, Phoenix CHPO, and SHPO in defining design criteria and reviewing developing designs of the Stage 2 - East APM station and maintenance facility. The FAA concluded, in consultation with the SHPO, that a sensitive design of the proposed facilities, considering factors such as massing, style, color, texture, glare, and potential for screening with vegetation, would have no adverse effect on the park. The project has potential to result in a beneficial effect by enhancing pedestrian access to the museum from the APM and Valley Metro Rail stations.

SOCIOECONOMIC

All acquisitions and relocations would be accomplished in accordance with the Uniform Relocation Assistance Real Property Acquisition Polices Act of 1970. This act establishes a standard process for Federally-approved or supported projects for relocation activities and requires fair market value to be paid for properties acquired plus relocation costs. Fair market values for properties to be acquired for airport expansion purposes would be determined by appraisal of comparable properties, including properties whose selling price would not be affected by ADP Alternative. Currently, as part of their ongoing noise mitigation program, PHX has a volunteer acquisition program working with property owners who currently want to sell their property. This program is being expanded to include properties within the APM Stage 2 right-of-way. In addition, PHX is working with business owners of the affected properties to evaluate means of providing assistance. A Maintenance of Traffic (MOT) plan could be developed during the design phase of the roadway project such that temporary traffic flow impacts would be minimized. During construction of the ADP projects, some lanes of Sky Harbor Boulevard could be closed at night from approximately 10:00 p.m. to 6:00 a.m. to accommodate construction. All lanes would likely remain open during the day to minimize on-airport traffic impacts during times of normal and peak airport activity. As part of the APM Stage 2 design process, planning would also be initiated to address any street abandonments that may be required as part of the project implementation.

WATER RESOURCES

Temporary degradation of surface water quality from water turbidity that could occur during the construction period when excavated areas are exposed prior to paving would be mitigated by controls implemented prior to construction such as straw or baled hay barriers placed within turbidity curtains.

SOLID WASTE

The ADP Alternative would be developed in accordance with standards developed by the United States Secretary of Transportation. Minimization/preventative actions that might reduce or eliminate construction impacts (construction and demolition waste) include measures outlined in FAA AC 150/5370-10B, *Standards for Specifying Construction at Airports*. According to the AC, the City's contractor shall submit a plan for disposal of waste materials prior to the start of construction.

OPERATIONAL MITIGATION MEASURES

This section contains the potential operational mitigation program for the FAA's preferred alternative. The following sections describe the ADP Alternative's potential operational mitigation measures associated with air quality, hazardous materials, water resources, and solid waste environmental impact categories.

Air Quality

As documented in **Chapter 4.0**, Environmental Consequences, implementation of the ADP Alternative would result in a reduction of aircraft emissions at PHX due to increased operational efficiencies. As a result, mitigation to address air quality impacts associated with the proposed project may not be necessary. In an effort to continue to operate PHX is an environmentally sound manner, the City of Phoenix would however continue to utilize the air quality emission reduction measures currently in place, and those which are inherent to the planning process. The ADP Alternative is intended to optimize the airfield layout consistent with existing and future aviation demand, thereby reducing aircraft emissions. The proposed surface transportation improvements to Sky Harbor Boulevard would improve the efficiency of the on-airport roadway system. Avoidance, or minimization, of areas or structures (e.g., terminal buildings, parking structures, etc.), which contribute to zones of restricted air movement and create localized "hot-spots" of air pollution would be minimized or eliminated. The ADP Alternative would be designed to provide separation and placement of the primary support facilities (e.g., main terminal buildings) in a manner that helps prevent the build-up of pollutants. Creating open-space, or "buffer zones", would provide distance between the air emission source locations (e.g., runway ends, taxiways, fuel facilities, parking garages) and any nearby potentially sensitive receptors (e.g., homes, schools, parks, etc.). Utilization of the Stage 2 APM system to access the Rental Car Center would reduce the number of passenger vehicles accessing the terminal areas, further reducing air emissions at the airport.

Hazardous Materials

Airport operations following development of the ADP Alternative are not expected to substantially alter the types of hazardous and other regulated materials used at the airport. The use of fuel and other regulated substances necessary for routine operations at the airport would continue and is expected to increase

due to the forecasted growth in operations at the airport. The storage and use of these materials are governed by a wide network of Federal and state regulations. Operations at PHX are conducted in full compliance with these regulations. When used in combination with technologies currently in place at the airport and safe work practices, the risks of causing environmental contamination are reduced.

Any construction activities that involve disturbance of the surface have the potential to expose and release previously unknown hazardous materials and wastes that may be located in the vicinity. In the event of a spill or unanticipated release of regulated materials including fuels, contractors will be required to cease work in the immediate area and report the release to the National Response Center (NRC). Special provisions will be included in the construction document to address the potential for encountering hazardous materials. All applicable Federal, state, and local regulations will be followed for the cleanup and disposal of hazardous waste during construction activities.

Water Resources

Water quality for the City of Phoenix is regulated by a variety of permits and plans. All activities associated with development of the ADP Alternative would be performed in accordance with the airport's Arizona Pollution Discharge Elimination System (AZPDES) and Multi-Sector General Permit (MSGP) requirements, appropriate state and Federal regulations and standards.

Water conservation can offset the increased water demand from the ADP Alternative. The City can participate in the conservation effort with regard to this project by implementing the following:

- Educate employees and tenants on correcting wasteful habits,
- Install water efficient plumbing fixtures, and
- Maintain plumbing fixtures and pipes to prevent leaks.

These permits, plans and conservation efforts, as described, have the potential to minimize water resource impacts associated with the ADP Alternative.

Solid Waste

PHX would continue with the City of Phoenix recycling efforts, "Phoenix Recycles", and work with local municipalities, businesses, and waste handlers to develop and implement source reduction strategies, resource recovery facilities, markets for recyclables, and waste to energy facilities to achieve a significant reduction in solid waste disposal volumes entering the landfill. CRInc's Phoenix MRF and the MRF at the 27th Avenue Solid Waste Management Facility could be utilized help reduce the amount of materials collected at PHX.

PREFERRED ALTERNATIVE

Under 40 CFR 1502.14, Federal agencies are required to identify a "Preferred Alternative" in the Final EIS. As defined in CEQ's 40 Questions and Answers about the NEPA regulations, "The 'agency's preferred alternative' is the alternative which the agency believes would fulfill its statutory mission and responsibilities, given consideration to economic, environmental, technical, and other factors."

The EIS considered a total of eight on-airport and off-airport alternatives. After careful screening of all potential impacts and consideration of agency and public comments, one build alternative, the Sponsor's proposed ADP project, and the No-Action Alternative were retained for detailed study in the EIS. **Table 4.1-1** of the FEIS presents a comparison of the environmental impacts of these two alternatives.

ENVIRONMENTAL IMPACTS

The environmental benefits of the ADP Alternative, as compared to the No-Action Alternative, include long-term reductions in air emissions of criteria pollutants (i.e., CO, NO_x, PM_{10}, $PM_{2.5}$, and VOCs). In addition, the ADP Alternative would improve surface transportation patterns as compared to the No-Action Alternative. Moreover, the ADP Alternative would not change the level of aircraft noise impacts to the surrounding area when compared to the No-Action Alternative. On the other hand, the ADP Alternative would require the acquisition of 16.4 acres, which would involve the relocation of 14 owner-operated businesses and 17 tenant-run businesses. Also, the ADP Alternative has the potential to affect historic properties; however, any potential adverse effects would be mitigated through a Section 106 Memorandum of Agreement executed by the FAA, State Historic Preservation Officer, and other relevant agencies. The project would also result in short-term air emissions increases during peak periods of construction. Finally, the ADP Alternative would require development in the 100-year floodplain adjacent to the Grand Canal, but the encroachment would not be significant.

OPERATIONAL IMPACTS

The ADP Alternative is more effective and efficient than the No-Action Alternative in meeting the FAA's Purpose and Need identified in this FEIS. As detailed below, the ADP Alternative provides substantial improvements in efficiency of terminal and ground operations and in efficiency of on-airport roadways,

Terminal Operations

The No-Action Alternative would not improve the efficiency of landside passenger facilities at PHX to accommodate forecast demand nor maintain an acceptable level of service to passengers. In contrast, the ADP Alternative would provide sufficient gate capacity to efficiently meet the forecast demand for domestic and international passengers through the 2015 forecast period while maintaining an acceptable level of service. The additional contact gates provided by the West Terminal would preclude the need to use remote gates and would provide a high level of service to passengers consistent with historical standards. Finally, development of the ADP Alternative would provide an opportunity to incorporate up-to-date security systems and layouts in the airport design. These up-to-date security systems would address a range of design considerations including airport access, passenger screening, and baggage monitoring systems.

Ground Operations

Under the No-Action Alternative, the dual crossfield taxiways would not be constructed. However, with the ADP Alternative, the development of the dual crossfield taxiways would be accomplished, and would improve the efficiency of airfield operations by facilitating the movement of aircraft between the north and south airfields and terminal complex. From a quantitative perspective, the ADP Alternative would reduce average operating time for all ground operations at PHX by an average of 0.6 minutes per aircraft as compared to the No-Action Alternative. Departing aircraft would experience the greatest reduction in average operating time of 1.2 minutes per aircraft. These gains in operational efficiency as compared to the No-Action Alternative would result in a cumulative economic benefit through the planning period of approximately $154.9 million.

Airport Access

Under the No-Action Alternative, Sky Harbor Boulevard would not be improved and the Stage 2 APM would not be constructed. Surface transportation analysis for the No-Action Alternative indicates that the future increase in daily passenger traffic and employee and service traffic would result in high to severe levels of congestion on Sky Harbor Boulevard during peak traffic periods. Under the ADP Alternative, the improvements to the airport's surface transportation system and development of the Stage 2 APM would improve airport access and the efficiency of the on-airport roadway system. Fewer intersections would function at a level of service "F" under the ADP Alternative as compared to the No-Action Alternative in 2015 (see **Table 4.20.3-2**). Moreover, development of the Stage 2 APM would further reduce vehicular traffic on airport roadways as compared to the No-Action Alternative. In addition, the Stage 2 APM connection to the City of Phoenix Light Rail Transit would provide intermodal access to the airport.

AGENCY AND PUBLIC INVOLVEMENT

At the draft stage in the EIS process, the FAA had not identified its "Preferred Alternative" for the proposed action. The FAA believes that this decision can be made after consideration of public and agency comments received throughout the EIS process and consideration of analyses prepared after publication of the DEIS. **Chapter 6.0** of this FEIS identifies the outreach conducted by the FAA to maximize the agency's evaluation of the proposed ADP project. Interested agency representatives and the public have been afforded an opportunity to review and comment on the Draft EIS and the FAA has considered the comments. Further the agency's careful scrutiny of the comments received on the Draft EIS, and the responses developed for those comments (see **Appendix J**) provided additional insight into the identification of the "Preferred Alternative".

IDENTIFICATION OF THE PREFERRED ALTERNATIVE

In consideration of the environmental and operational parameters outlined above, the FAA has determined that the ADP Alternative, the sponsor's proposed project, is the agency's Preferred Alternative. Based on the analysis as documented in this FEIS, the ADP Alternative would meet the FAA's Purpose and Need for the proposed project to: 1) meet the needs of the National Airspace System, 2) improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers (LFA, 2003), 3) maintain the safety of

aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time, and 4) improve access to the airport and efficiency of the on-airport roadway system.

COORDINATION AND PUBLIC INVOLVEMENT

A public involvement program was implemented to ensure that information was provided to the general public and public agencies from the earliest stages of project planning and that input from interested parties was received and reviewed throughout the EIS process. Two scoping meetings were accomplished at the Holiday Inn Select Phoenix Airport on Wednesday, April 23, 2001 as part of the EIS scoping process for this study. An agency scoping meeting was held in the afternoon, which was followed by a public scoping meeting in the evening. Court reporters were present to record all testimony given in the two meetings. In addition, a PowerPoint presentation was shown, a handout was distributed, and presentation boards were displayed at both meetings that summarized the proposed action as well as the scoping and EIS process (see **Appendix G** of the FEIS).

A public workshop on the proposed project was conducted on October 16, 2002. The workshop was held on October 16, 2002, between 5:00 p.m. and 8:00 p.m., at the Holiday Inn Select Phoenix Airport.

On June 10, 2005, the EPA published a Notice of Availability for the DEIS in the Federal Register which announced the beginning of the 45-day public and agency review period on the DEIS. Advertisements announcing the availability of the DEIS were also published in the *Arizona Republic*, *Arizona Business Gazette*, and *LaVoz* newspapers. The comment period on the DEIS was scheduled to end on July 26, 2005; however, based on a request from a local agency, FAA extended the comment period for the DEIS to August 10, 2005. Advertisements were placed in local newspapers to inform the general public and other interested parties of the comment period extension.

Following publication of the Notice of Availability, public information meetings on the DEIS were conducted on July 12th and 13th, 2005 at the Phoenix Airport Marriott and Wesley Community Center, respectively. The information meetings were held between 5:00 p.m. and 9:00 p.m. Advertisements for the information meetings were published in the *Arizona Republic*, *Arizona Business Gazette*, and *LaVoz* newspapers.

Public hearings on the DEIS were conducted on July 12th and 13th, 2005 at the Phoenix Airport Marriott and Wesley Community Center, respectively. The public hearings occurred from 6:00 p.m. to 9:00 p.m. Advertisements for the hearings were published in the *Arizona Republic*, *Arizona Business Gazette*, and *LaVoz* newspapers. The public hearings provided agencies and the public an opportunity to provide comments directly to the FAA representative. The public hearing was presided over by a hearing officer and recorded via a certified court reporter. A Spanish/English interpreter was also available to attendees as necessary.

The Notice of Availability for the Final EIS was published in the Federal Register on February 10, 2006. The FEIS will be available for review by the concerned agencies and the public for a period of 30 days. Notification of the document's availability was also accomplished through notification in the local media. Anyone wishing to comment on the FEIS may do so in writing during the 30-day review period.

The FEIS has also been distributed to Federal, state, and local agencies that have jurisdictional responsibility or an interest in the study and copies have been placed in libraries and reading rooms within the Phoenix area. Agencies and the public will have a period of 30 days to respond on the FEIS. Summaries of the comments received, responses, and any necessary revisions to the EIS will be published in the FAA Record of Decision.

RECORD OF DECISION

After publication of the FEIS, and a 30-day period following a Federal Register notice of its release, the FAA will issue a Record of Decision that will document the FAA's decision on the proposed Federal action.

APPROVAL OF THE EIS

After careful review and thorough consideration of the facts contained herein, and following considerations of the views of the public and those Federal agencies having jurisdiction by law or special expertise with respect to the environmental impacts described, the undersigned finds that the proposed Federal action is consistent with the existing national environmental policies and objectives as set forth in Section 101(a) of the National Environmental Policy Act of 1969.

APPROVED: _____ JAN 24 2006

Mark A. McClardy
Manager, Airports Division
Western-Pacific Region

Date

DISAPPROVED: _____ _____

Mark A. McClardy
Manager, Airports Division
Western-Pacific Region

Date

Chapter 1.0
Purpose and Need

CHAPTER 1.0
PURPOSE AND NEED

1.1 INTRODUCTION

This Phoenix Sky Harbor International Airport Development Program Final Environmental Impact Statement (FEIS) has been prepared by the Federal Aviation Administration (FAA) in conformance with the President's Council on Environmental Quality (CEQ) regulations that implement the procedural provisions of the National Environmental Policy Act of 1969 (NEPA); and in accordance with the requirements of FAA Orders 1050.1E, *Environmental Impacts: Policies and Procedures* and 5050.4A, *Airport Environmental Handbook*. The purpose of this document is to consider and disclose the potential environmental impacts that may result from construction and operation of the proposed project and alternatives to the proposed project, and to provide decision-makers and the public with sufficient information to make informed decisions when planning future actions. This chapter describes the proposed Airport Development Program (ADP) projects for which this FEIS has been prepared, explains the process under which the FEIS analysis has been conducted, describes the organization of the document, provides background on Phoenix Sky Harbor International Airport (PHX) and of the proposed development, and describes the purpose and need for the proposed project at PHX.

The FAA is responsible for complying with NEPA whenever an airport sponsor seeks approval of an Airport Layout Plan (ALP) for proposed projects not previously identified on an ALP. The FAA has reviewed the proposed projects at PHX and determined that an EIS would be the most appropriate document for the agency to fulfill its obligations under NEPA and FAA Orders 1050.1E (FAA, 2004a) and 5050.4A (FAA, 1985). FAA's determination to proceed with an EIS is based on the project's potential to be controversial with respect to possible air quality and cultural resource impacts and the anticipated level of public involvement and oversight. In March 2001, the FAA published a Notice of Intent (NOI) to prepare an EIS for the proposed project at PHX. Public and agency scoping meetings were held in April 2001 to receive comments regarding the scope of the analysis and identify any potential environmental impacts associated with the proposed project. The DEIS was released to Federal, state and local agencies, as well as the public on June 10, 2005. A 45-day comment period followed the release of the DEIS. As a result of comments received on the DEIS, the FAA extended the comment period deadline from July 26, 2005 to August 10, 2005 for a total of 62 days. Public Information Meetings and Public Hearings occurred on July 12th and 13th 2005 at the Phoenix Airport Marriott and Wesley Community Center, respectively. Comments received on the DEIS were reviewed by the FAA. FAA responses to comments on the DEIS are contained in Appendix J: Comment/Response Database of this FEIS. The DEIS has been updated based on comments received and incorporated into this FEIS.

In accordance with FAA Order 1050.1E, FAA can make a final decision to act on the proposed project no sooner than 30 days after the FEIS Notice of Availability is published in the Federal Register. At the conclusion of the 30-day period, FAA will issue a final decision in a Record of Decision (ROD).

1.1.1 THE PROPOSED PROJECTS AT PHX

The City of Phoenix Aviation Department (City) has proposed terminal, airfield, and surface transportation improvements at PHX to accommodate forecast passenger demand, while providing airline passengers and tenant airlines with a level of service consistent with that historically provided at the airport. The proposed improvements would further the City's objective to meet passenger demand while continuing to provide airline passengers and tenant airlines with a level of service consistent with that historically provided at PHX.

The forecast of aviation activity for PHX indicates that passenger enplanements at the airport will increase from 18.6 million passengers in 2003 to approximately 25.2 million in 2015 (LFA, 2003). The 2003 forecast of aviation demand at PHX is within 6 percent of the forecast level of aviation activity as presented in the FAA Terminal Area Forecast (TAF) published in February 2005 (see 2005 TAF, Appendix H, of this FEIS). To meet the projected passenger demand, the City is proposing improvements at PHX that are intended to alleviate potential future congestion and shortfall of the existing facilities and to enable the airport to more effectively meet the needs of the traveling public. The City has determined that a replacement passenger terminal and development of associated improvements (the ADP) are required to maintain and improve the level of service at the airport for future travelers. Level of service is normally expressed as a measure of passenger inconvenience (e.g., delayed or missed flights), and/or the space, size, number or kinds of facilities available for passenger processing.

The demand for airline service into and out of the airport is created by the need for air transportation in the air carrier service region. The airport capacity is basically determined by the number and configuration of the runway system, air traffic operation procedures, and supporting navigational aids. The terminal buildings are then designed to serve the forecast passenger demand in balance with the capacity of the airfield system. Inasmuch as no additional runways are being constructed, the capacity of the airport will not be changed by the proposed terminal improvements. The terminal facilities at PHX have been providing service to the users at a reasonable level of service. The proposed improvements would not result in the number of aircraft operations at PHX increasing beyond that currently projected in the FAA approved aviation forecast, but would provide facilities to balance the capabilities of the airside and landside operations. It is, therefore, assumed in this EIS that the same number of enplaned passengers and aircraft operations would need to be processed in 2015 under the No-Action Alternative as under other reasonable alternatives evaluated.

It is sometimes believed that providing additional terminal facilities at an airport will, by itself, induce additional demand for air travel. However, experience at other airports indicates that this type of induced demand does not occur except in extremely unusual cases where the lack of facilities has resulted in intolerable congestion levels that cannot be effectively mitigated and limit the ability of airlines to provide air service. In response to lower levels of service that would result in demand exceeding facility capacity, passengers may change their behavior in terms of when and how they arrive at the airport, but they are unlikely to base their decisions of whether or not to travel on the level of service provided.

The proposed improvements at PHX would further the City's objective to meet passenger demand while continuing to provide airline passengers with a level of service consistent with that historically provided at

the airport. The proposed improvements would also provide for a replacement to Terminal 2, which is at the end of its useful life. The level of service currently provided in Terminal 2 is below the minimum service levels desired by the City (see Section 1.2.1.1 of this FEIS). The current passenger activity level of 1.7 million annual enplaned passengers is at or close to the limit of Terminal 2 to efficiently accommodate airline passengers. Additional increases in passenger demand in Terminal 2 would further reduce the level of service to passengers.

For PHX or any airport to operate efficiently, terminals and supporting systems should be able to process passengers at a rate commensurate with the ability of the airfield to move aircraft and passengers into and out of the airport. At PHX, the capacity of the airfield exceeds the level of traffic that can be accommodated in the current terminal configuration at the desired level of service. The effects of this imbalance will become more severe in the future, as the number of aircraft operations at the airport increases, consistent with the FAA approved aviation forecast for PHX. The availability of additional landside facilities would allow PHX to maintain a level of service provided to passengers and tenant airlines consistent with historical standards, and accommodate an increase in service provided by airlines at the airport in response to increased demand. The proposed ADP at PHX includes the following:

- Demolition of Terminal 2 and Ancillary Facilities,
- West Terminal Development (33-Gate Terminal), Garage, and Terminal Roadways,
- Modifications to Terminal 4, Concourse N4 International Gates,
- Construction of Crossfield Taxiways Uniform "U" and Victor "V",
- Sky Harbor Boulevard Modifications, and
- Construction of Stage 2 of the Automated People Mover System (APM).

These development projects are depicted on the draft ALP for PHX dated November 2005 (**Figure 1.1-1**). Any projects identified on the ALP that are not part of the proposed project and may require environmental analysis would be the subject of a separate environmental evaluation at such a time as those projects become "ripe" for decision. At that time the FAA shall determine the appropriate level of NEPA review for the project in accordance with FAA Orders 1050.1E and 5050.4A (or the most current update to Order 5050.4). Based on the Phoenix Sky Harbor International Airport, Airport Development Program Final EIS, the FAA will issue a Record of Decision (ROD).

Conceptual layouts of the facilities and projects proposed as part of the ADP are contained in the *West Terminal E.I.S. Project Description* (DMJM Aviation/HDR, June 2004). Planning criteria used in development of the proposed project are documented in the *West Terminal Planning and Program Criteria Document* (Landrum and Brown, October 2000). If additional planning data become available, this information will be evaluated and the conceptual designs for the project will be modified accordingly. The FAA will review any planned projects or modifications to existing projects to determine if additional environmental review is required. If additional review is required, FAA shall determine the level of NEPA review in accordance with FAA Orders 5050.4A and 1050.1E. **Figure 1.1-2** presents an overview of the proposed projects, and the following text provides a brief description of each.

There are a number of other airport development projects currently ongoing at PHX. These projects will be in development and/or operational concurrent with the ADP. These include:

- Development of the Rental Car Center (RCC),
- Development of the East Economy Parking Garages (EEPG),
- Construction of Terminal 4 Concourse S1, and
- Development of the APM Stage 1.

These other development projects have been the subject of separate NEPA reviews and are not considered on an individual basis in this FEIS. These projects are addressed as part of the airport-wide cumulative impact analysis contained in Chapter 4.0, Environmental Consequences, of this FEIS.

As part of the ADP design process, the City performed and documented a broad range of studies relating to the effectiveness of the proposed project to meet airport needs. To the extent possible, the results of these studies were incorporated into the FEIS analysis. Prior to incorporation into this FEIS, the data, analytical techniques, and results of the City studies were independently reviewed for completeness and technical accuracy by the FAA and their third party Consultant.

Demolition of Terminal 2 and Ancillary Facilities

This project would entail the demolition of the existing Terminal 2 facilities (Figure 1.1-3). The demolition of Terminal 2 would result in the loss of 14 gates at PHX that would need to be replaced. Terminal 2 was originally constructed in 1962 and is the oldest of the three terminals at PHX. The existing configuration and condition of Terminal 2 are not conducive to modifications that would allow the installation of additional gates in response to passenger demand. Many of the structural and mechanical systems in the terminal would require significant retrofit to satisfactorily accommodate additional passenger activity. Furthermore, modifications to Terminal 2 would be complicated by the presence of large quantities of asbestos containing materials that would require removal and proper disposal prior to any modification activities (DMJM Aviation/HDR, 2003). Demolition of Terminal 2 would provide an area for construction of the proposed West Terminal and re-alignment of Sky Harbor Boulevard. Demolition of Terminal 2 facilities would include the terminal core, concourse, below grade utility/baggage make-up, roadway and ground transportation facilities, the parking garage complex, and the existing fuel island and hydrant fueling system. Development of the proposed West Terminal would also affect ancillary facilities that must be removed or relocated. These facilities include the existing Executive Terminal, Airport Operations Center, American Airlines GSE Maintenance Buildings, Gate 220 and the West Economy parking lot.

Building Inventory

101	RENTAL CAR COMPLEX (HERTZ)	203	RENTAL CAR COMPLEX (NATIONAL)	262	FUTURE TECHNOLOGY BUILDING	310	AIR CARGO COMPLEX, SOUTH
102	RENTAL CAR COMPLEX (HERTZ)	204	RENTAL CAR COMPLEX (NATIONAL)	263	CENTER AIRFIELD ELECTRICAL VAULT	311	SOUTH ELECTRICAL VAULT
120	SMALL 4-UNIT T-HANGAR	205	RENTAL CAR COMPLEX (NATIONAL)	264	ARFF BUILDING 19	312	FBO HANGAR/OFFICES (SWIFT)
121	SMALL 4-UNIT T-HANGAR	206	MAINTENANCE BUILDING	265	AMERICA WEST MAIL SORT	315	ARIZONA AIR NATIONAL GUARD COMPLEX
122	SMALL 4-UNIT T-HANGAR	207	REMOTE TRANSMITTER RECEIVER (RTR-3)	270	RENTAL CAR GARAGE	316	AIRPORT SURVEILLANCE RADAR (ASR-9)
123	SMALL 4-UNIT T-HANGAR	208	COMMERCIAL BUILDING (LSG/SKY CHEF)	271	FIRE PUMP HOUSE (AMS)	401	SACRED HEART CATHOLIC CHURCH
124	8-UNIT EXECUTIVE HANGAR	209	COMMERCIAL BUILDING (LSG/SKY CHEF)	272	TRITURATOR	402	HONEYWELL
125	AIRCRAFT WASHRACK	210	CNG FACILITY	275	TERMINAL 4 (CORE)	403	WYLE ELECTRONICS
126	8-UNIT EXECUTIVE HANGAR	221	FAA BUILDING/TRACON	276	TERMINAL 4 (CONCOURSE N-1)	404	BANK OF AMERICA COMPLEX
127	2-UNIT CORPORATE HANGAR	222	EXECUTIVE TERMINAL	277	TERMINAL 4 (N-1 TO N-2 CONNECTING BRIDGE)	405	RENTAL CAR CENTER
128	8-UNIT EXECUTIVE HANGAR	223	PAINT STORAGE	278	TERMINAL 4 (CONCOURSE N-2)		
129	CORPORATE HANGAR AND SHOP (SALT RIVER PROJECT)	224	GREENHOUSE	279	TERMINAL 4 (N-2 TO N-3 CONNECTING BRIDGE)		
130	CORPORATE HANGAR AND SHOP (DEPT OF PUBLIC SAFETY)	225	FLEET MAINTENANCE BUILDING	280	TERMINAL 4 (CONCOURSE N-3)		
131	COMMERCIAL BUILDING (EMBRY-RIDDLE)	226	DRY STORAGE	281	TERMINAL 4 (N-3 TO N-4 CONNECTING BRIDGE)		
132	AIRCRAFT WASHRACK	227	2-STORY OFFICE BUILDING (AVIATION DEPT)	282	TERMINAL 4 (CONCOURSE N-4, INTERNATIONAL)		
133	EXECUTIVE HANGAR	228	RESTROOMS - TAXI HOLDING AREA	283	TERMINAL 4 (N-4 TO S-4 CONNECTING BRIDGE)		
134	COMMERCIAL BUILDING (VACANT)	229	AIR CARGO COMPLEX, WEST	284	FUTURE TERMINAL 4 (S-1 TO N-1 CONNECTING BRIDGE)		
135	RESTAURANT/LOUNGE (LEFT SEAT)	230	FUTURE AIR CARGO SUPPORT	285	FUTURE TERMINAL 4 (CONCOURSE S-1)		
136	HANGAR/OFFICES (SCENIC AIR)	239	MAINTENANCE SHOP (DELTA)	286	FUTURE TERMINAL 4 (S-1 TO S-2 CONNECTING BRIDGE)		
137	HANGAR/OFFICES (VACANT)	240	MAINTENANCE SHOP (DELTA)	287	FUTURE TERMINAL 4 (CONCOURSE S-2)		
138	HANGAR (AIREVAC)	241	MAINTENANCE SHOP (AMERICAN)	288	TERMINAL 4 (CONCOURSE S-3)		
139	AIRCRAFT WASHRACK	242	MAINTENANCE SHOP (DYNAIR FUELING)	289	TERMINAL 4 (S-3 TO S-4 CONNECTING BRIDGE)		
140	OFFICES (CIVIL AIR PATROL)	246	GATEHOUSE	290	TERMINAL 4 (S-4 CONCOURSE)		
141	ARFF BUILDING 29	247	PARKING STRUCTURE - TERMINAL 2	291	COMMUTER BOARDING		
142	INDUSTRIAL COMPLEX (ALLIED SIGNAL)	248	TERMINAL 2 (CORE)	292	AIRLINE MAINTENANCE HANGAR (AMERICA WEST)		
143	8-UNIT EXECUTIVE HANGAR	249	TERMINAL 2 (SOUTH CONCOURSE)	293	AIRLINE MAINTENANCE HANGAR (SOUTHWEST)		
144	CORPORATE HANGAR AND SHOP (MESA AIRLINES)	250	TERMINAL 2 (EAST CONCOURSE)	294	FUTURE TERMINAL 4 (S-2 TO S-3 CONNECTING BRIDGE)		
146	FUEL TERMINAL (DYNAIR FUELING)	251	AIRPORT OPERATIONS CENTER	295	FUTURE EAST ECONOMY PARKING GARAGE 'C'		
147	FUTURE WEST TERMINAL (CONCOURSE)	252	FAA OFFICES	296	FUTURE CNG FACILITY		
148	FUTURE WEST TERMINAL (CONNECTING BRIDGE)	253	FAA CONTROL TOWER	301	RENTAL CAR COMPLEX (BUDGET)		
149	FUTURE WEST TERMINAL (CONCOURSE)	254	FAA OFFICES	302	RENTAL CAR COMPLEX (BUDGET)		
150	FUTURE WEST TERMINAL (PARKING GARAGE)	255	TERMINAL 3 (NORTH CONCOURSE)	303	RENTAL CAR COMPLEX (BUDGET)		
151	FUTURE WEST TERMINAL (TERMINAL)	256	TERMINAL 3 (CORE)	304	RENTAL CAR COMPLEX (BUDGET)		
152	FUTURE WEST TERMINAL (CONCOURSE)	257	BUNKER & CONVEYOR BUILDING	305	EAST ECONOMY PARKING GARAGE 'A'		
153	FUTURE WEST TERMINAL (CONNECTING BRIDGE)	258	TERMINAL 3 (SOUTH CONCOURSE)	306	EAST ECONOMY PARKING GARAGE 'B'		
154	FUTURE WEST TERMINAL (CONCOURSE)	259	PARKING STRUCTURE - TERMINAL 3	307	OFFICE FOR FORESTRY SERVICE		
155	FUTURE WEST TERMINAL (CONNECTING BRIDGE)	260	NORTH AIRFIELD ELECTRICAL VAULT	308	FBO HANGAR/OFFICES (CUTTER)		
156	FUTURE WEST TERMINAL (CONCOURSE)	261	FUTURE AIR TRAFFIC CONTROL TOWER	309	FBO HANGAR/OFFICES (CUTTER)		

Airport Monuments

LEGEND	POINT	DESCRIPTION
Ⓖ		PAC
Ⓗ		SAC
Ⓙ		SAC
Ⓜ		PAC
Ⓝ		SAC
Ⓟ		SAC
①	LAT: 33° 26' 27.10" LON: 112° 01' 47.27"	RW 8
②	LAT: 33° 26' 26.96" LON: 111° 59' 31.69"	RW 26
③	LAT: 33° 25' 51.81" LON: 112° 01' 37.66"	RW 7L
④	LAT: 33° 25' 51.73" LON: 111° 59' 36.04"	RW 25R
⑤	LAT: 33° 25' 43.89" LON: 112° 01' 37.57"	RW 7R
⑥	LAT: 33° 25' 43.83" LON: 112° 00' 05.54"	RW 25L

NOTES

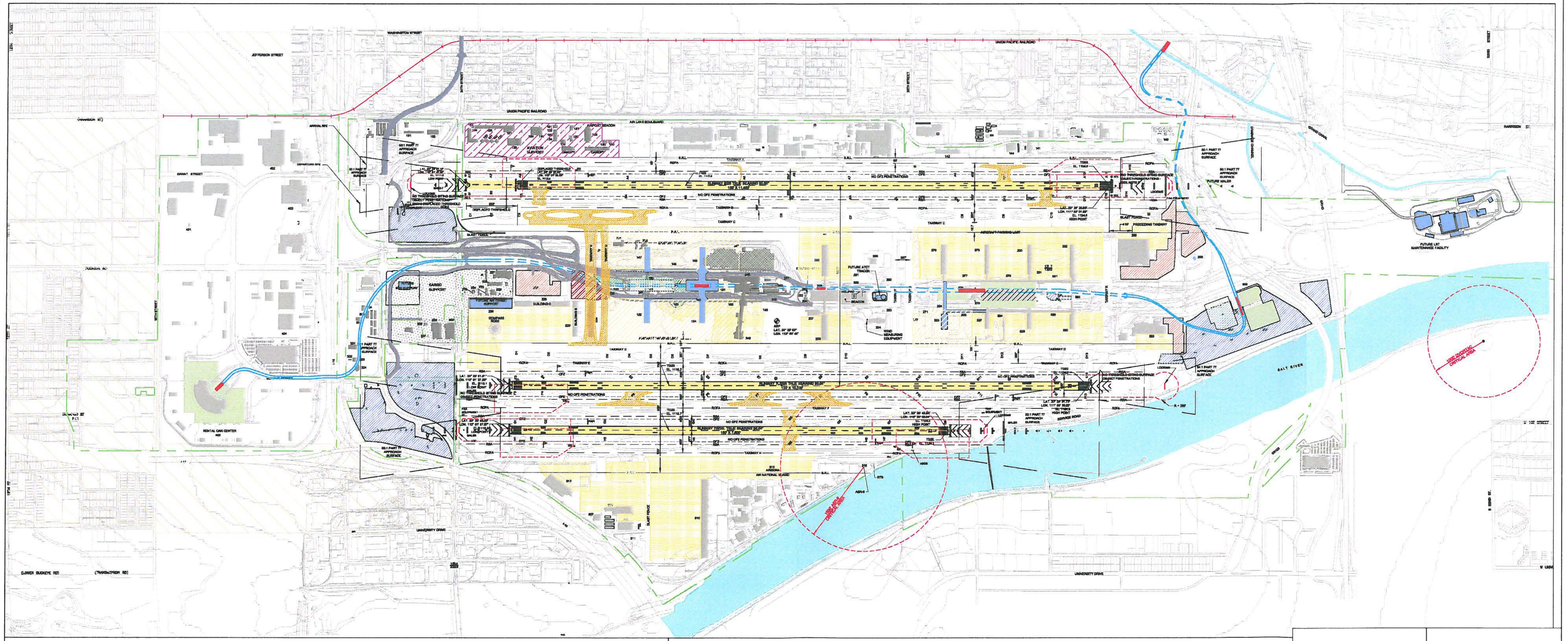
1. HELIPAD IS DEACTIVATED INDEFINITELY.
2. EACH MONUMENT HAS BEEN SURVEYED, AND ALL CONTRACTORS WILL BE MADE AWARE OF THEIR LOCATION PRIOR TO ANY WORK PERFORMED AT THE AIRPORT.
3. CONTROLS FOR AREAS WITHIN THE RPZ AND OUTSIDE THE AIRPORT PROPERTY LINE TO BE DETERMINED.
4. TAXIWAY WIDTHS ARE TYPICALLY 75', UNLESS NOTED OTHERWISE.
5. RUNWAY 26 AOA ROADWAY PENETRATES 34:1 THRESHOLD SITING SURFACE. VEHICLES WILL BE RESTRICTED.

Legend

EXISTING	FUTURE	DESCRIPTION
— — — —	SAME	AIRPORT PROPERTY LINE (APL)
▭	🟦	BUILDING
NONE	■	BUILDING TO BE REMOVED
═	▬	ROAD
─┼──┼─	─┼──┼─	RAILROAD
—B.R.L.—	SAME	BUILDING RESTRICTION LINE
—ROFA—	SAME	RUNWAY OBJECT FREE AREA
—RSA—	SAME	RUNWAY SAFETY AREA
—OFZ—	SAME	OBSTACLE FREE ZONE
───	SAME	NAVAID CRITICAL AREA
───	SAME	RUNWAY PROTECTION ZONE
───	SAME	GROUND CONTROL LINE
12 | 7 13 | 18	SAME	SECTION CORNER
───	SAME	HOLD BAR
───	SAME	FENCE
⚑	SAME	WINDSOCK
⊗	SAME	AIRPORT REFERENCE POINT

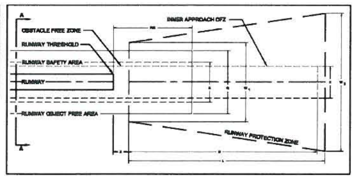
Legend

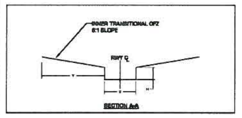
EXISTING	FUTURE	DESCRIPTION
NONE	▬	APM ALIGNMENT ELEVATED/SURFACE
NONE	▬	APM ALIGNMENT TUNNEL
NONE	🟥	APM STATION
▨	SAME	AIRPORT PARKING
NONE	▨	AIRPORT PARKING TO BE REMOVED
🟩	▭	PARKING STRUCTURE
NONE	▨	PARKING STRUCTURE AND TERMINAL
NONE	▩	PARKING STRUCTURE TO BE REMOVED
▨	SAME	EMPLOYEE PARKING
NONE	▨	EMPLOYEE PARKING TO BE REMOVED
▭	▨	APRON
🟨	SAME	RUNWAY PAVEMENT
NONE	▨	AIRFIELD PAVEMENT
NONE	▒	CARGO SUPPORT
NONE	▨	AVIATION SUPPORT
▭	SAME	COMMUNITY NOISE RDUCTION PROGRAM AREA
▭	SAME	WATERWAYS

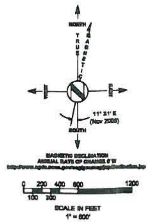


RUNWAY SURFACES TABLE

RUNWAY	APPROACH VISIBILITY MINIMUMS (RVR)	AIRCRAFT GROUP	END EL. (MSL)	RSA C	RSA P	OFA Q	OFA R	RPZ W1	RPZ W2	RPZ L	RPZ Z	OFZ D	OFZ G	OFZ H	OFZ Y
8	1/2 mi	D-V	1111.8	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	575'
26	1/2 mi	D-V	1134.6	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	575'
7L	1/2 mi	D-V	1110.1	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	575'
25R	1 mi	D-V	1134.0	500'	1,000'	800'	1,000'	800'	1,010'	1,700'	200'	n/a	n/a	n/a	n/a
7R	1/2 mi	D-V	1110.9	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	575'
25L	1/2 mi	D-V	1133.3	500'	1,000'	800'	1,000'	1,000'	1,750'	2,500'	200'	400'	2,400'	37'	575'







NON-STANDARD RSA CONDITIONS

DEVIATION DESCRIPTION	STANDARD[1]	EXISTING	RESOLUTION
RUNWAY 25L SAFETY AREA LENGTH BEYOND RUNWAY END	1000'	797'	PENDING FAA DETERMINATION[2]

[1] AC 150/5300-13

[2] SEE FAA LETTER OF [illegible]

REV. NO.	DRAWN	CHK'D	APP'D	DESCRIPTION	DATE
				FAA APPROVAL	1/26/94
				FAA APPROVAL	5/9/01
				CURRENT SUBMISSION	11/23/05

Aviation Director (or Designee)

Date:

Airport Approval Block

FAA Disclaimer

The contents of this plan do not necessarily reflect the official views or policy of the FAA. Acceptance of these documents by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

FAA Approval Block

Phoenix Sky Harbor International Airport (PHX)
Phoenix, Arizona

Future Airport Layout Plan

City of Phoenix, Aviation Department - November 2005

DRAWN BY: DMJM/HDR

PREPARED BY: RICONDO & ASSOCIATES, INC.

DRAWING No.

SHEET 4 OF 18

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Existing Facilities and Proposed Developments

FIGURE
1.1-1

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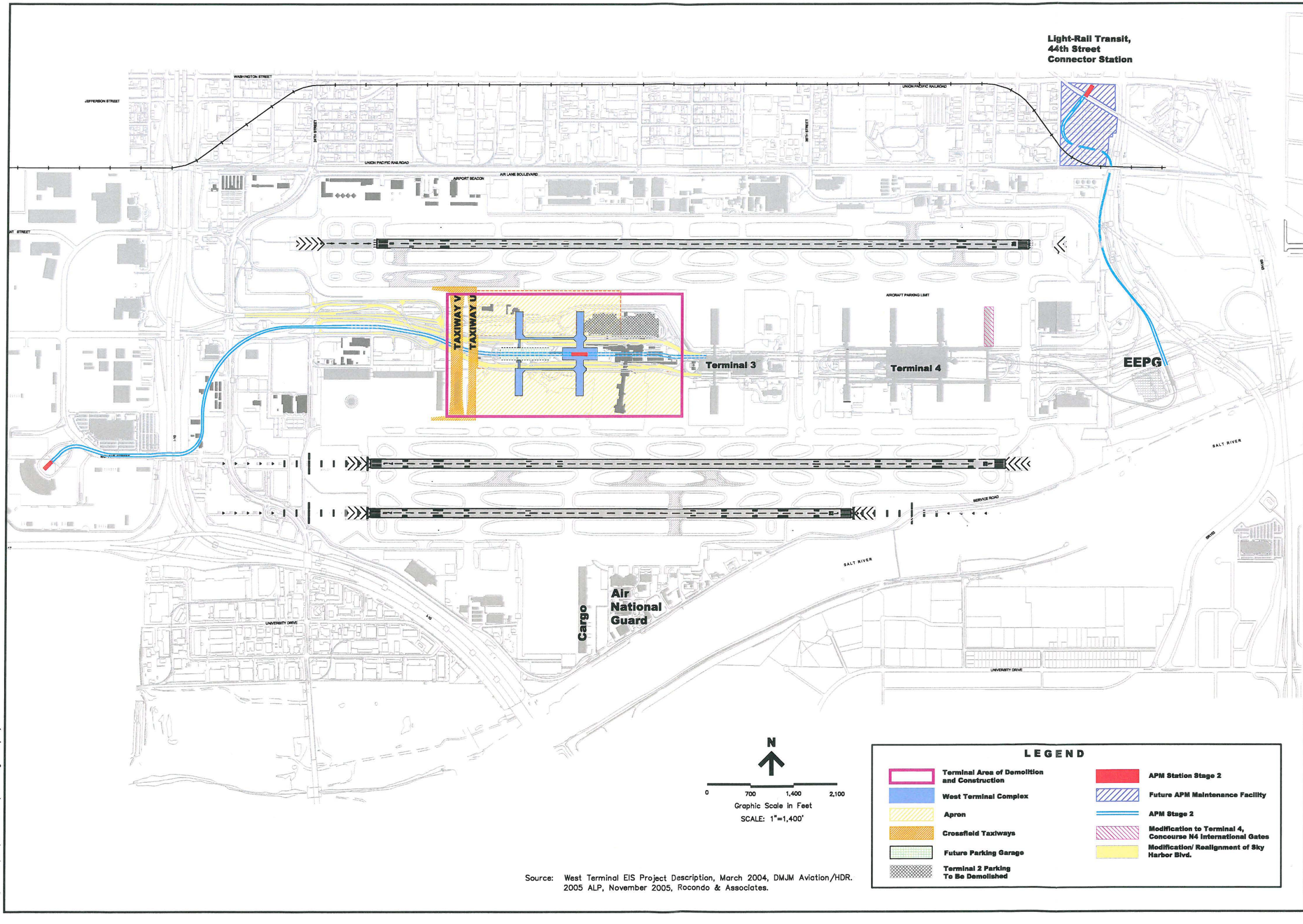
Phoenix Sky Harbor INTERNATIONAL AIRPORT

Environmental Impact Statement

Airport Development Program Proposed Projects



LEGEND

- Terminal Area of Demolition and Construction
- West Terminal Complex
- Apron
- Crossfield Taxiways
- Future Parking Garage
- Terminal 2 Parking To Be Demolished
- APM Station Stage 2
- Future APM Maintenance Facility
- APM Stage 2
- Modification to Terminal 4, Concourse N4 International Gates
- Modification/ Realignment of Sky Harbor Blvd.

Source: West Terminal EIS Project Description, March 2004, DMJM Aviation/HDR. 2005 ALP, November 2005, Rocondo & Associates.

FIGURE 1.1-2

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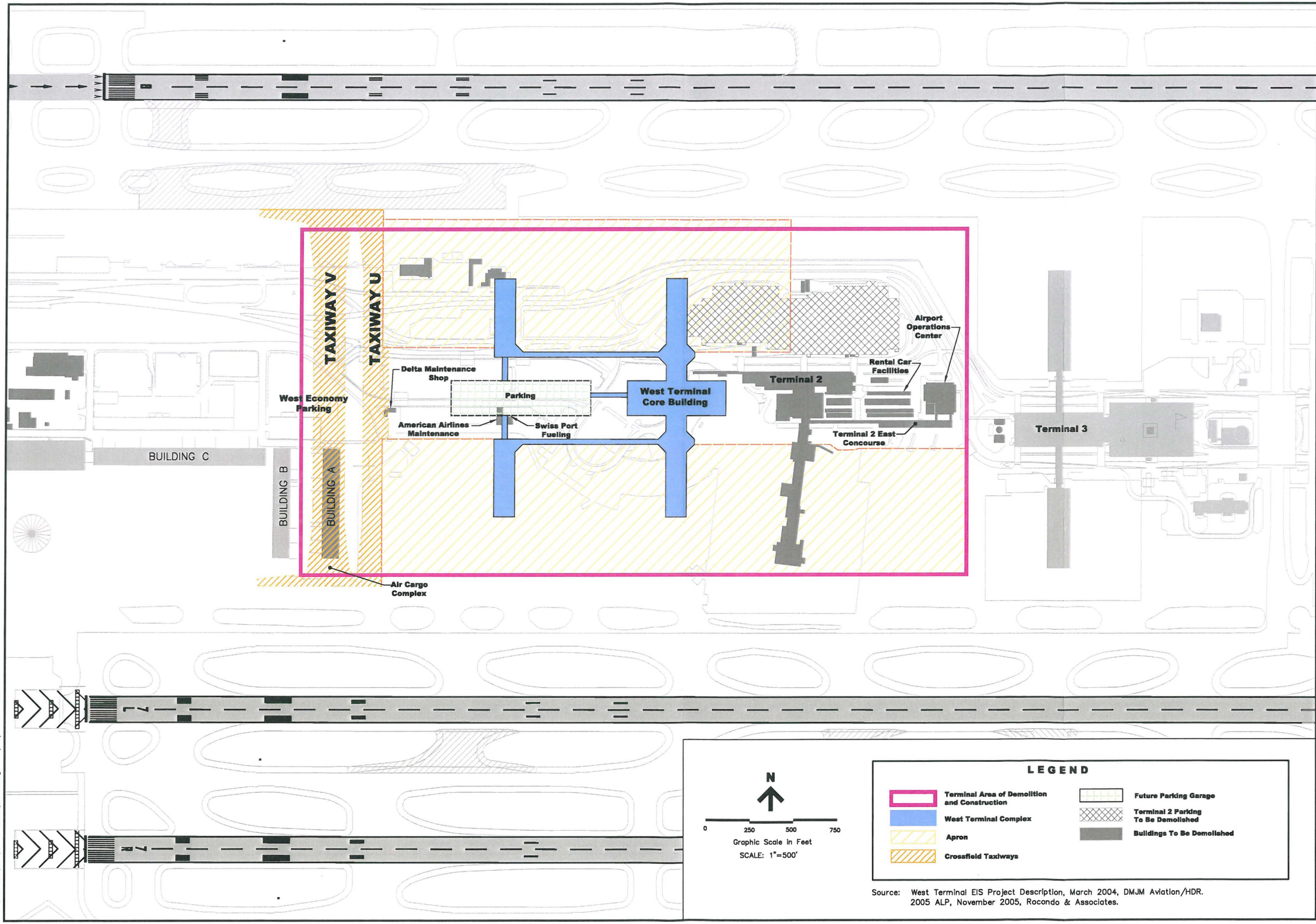

Source: West Terminal EIS Project Description, March 2004, DMJM Aviation/HDR.
2005 ALP, November 2005, Rocondo & Associates.

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Conceptual Terminal Layout and Crossfield Taxiways

FIGURE 1.1-3

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West Terminal Development

Development of the West Terminal would provide a balance between airfield operations and terminal capacity, provide sufficient gates to meet the 2015 demand, and maintain an acceptable level of service to passengers. Facility requirements for the West Terminal are based upon projected levels of passenger and airline activity through 2015, the number and types of airlines, airline requirements and local factors such as the number of connecting versus origin and destination (O&D) passengers, vacation versus business travelers, etc. Table 1.1.1-1 provides a summary of facility design recommendations for the West Terminal. Design parameters are based on projected facility requirements to accommodate passengers utilizing domestic spoke airlines and international air carriers (excluding America West, whose domestic and international activity would remain in Terminal 4). The proposed 33-gate configuration of the West Terminal could be realized through a phased incremental development of contact gates as demand dictates.

The conceptual layout (Figure 1.1-3) for the West Terminal consists of a central terminal with a 33-gate north/south concourse configuration. Concourses would be constructed and connected via bridges outfitted with moving sidewalks. Vehicular roadways would surround the terminal with loading/unloading activity on the north and south sides. A parking garage would be associated with the proposed airport development project. Federal Inspection Services (FIS) facilities for international passenger processing would also be accommodated in the West Terminal. An APM station would be located in the lower portion of the West Terminal Complex. An underground hydrant fueling system would be developed to support aircraft operations at the West Terminal. The terminal complex could be expanded in the future to allow for future expansion as demand dictates. Any expansion beyond the proposed 33-gate terminal is beyond the scope of this EIS and would be subject to a separate NEPA approval process.

TABLE 1.1.1-1
2015 PROGRAM REQUIREMENTS
TERMINAL FACILITIES PLANNING CRITERIA

Domestic Facilities Breakdown	Program Requirements Forecast Year Activity 2015 Area (Square Feet)
Gates	
Total Departure Lounge Area	81,300
Total Airline Space	311,700
Total Concessions	92,200
Total Public Space	317,900
Federal Inspection Service Facilities	
Total Federal Inspection Services	115,950
Total Other Areas	7,400
Total International Public Space	128,000
Total Gross Area in the West Terminal	**1,054,450**

Source: Exhibit II-1, West Terminal EIS, Project Description, June 2004, DMJM Aviation/HDR.

The existing airfield at PHX is designed to fully accommodate aircraft having Airport Reference Code (ARC) characteristics D-V. The ARC represents the airport's ability to fully accommodate a "critical" aircraft having *Aircraft Approach Category* "D" approach speeds (141 knots or more, but less than 166 knots) and *Airplane Design Group* "V" wingspans (171 feet and up to but not including 214 feet). An example of aircraft having those characteristics includes the Boeing 747 Jumbo Jet.

As depicted on the ALP, future crossfield Taxiways "U" would be designed to accommodate operation of aircraft having Airplane Design Group (ADG) V characteristics and Taxiway "V" would be designed to accommodate occasional operations by aircraft having ADG VI characteristics (airplane wingspan from 214 feet up to but not including 262 feet). The proposed aircraft parking apron and taxilanes would be constructed to accommodate operations by one ADG V (airplane wingspan from 171 feet up to but not including 214 feet) aircraft at a time, such as the Boeing 747.

Modifications to Terminal 4, Concourse N4 International Gates

Existing international arrivals and departures at PHX occur at gates primarily located at the north end of Concourse N4 in Terminal 4 (**Figure 1.1-2**). International operations of airlines other than America West[1] would be relocated to the new international gates and international passenger processing facilities in the West Terminal. The majority of the existing FIS and other international passenger processing facilities currently in Concourse N4 would remain to accommodate international operations by America West. The international gates in Concourse N4 would be dedicated to that use. America West does not anticipate using these gates to support additional domestic operations. There would be minor changes to the configuration of the existing facilities on Concourse N4. There are no plans to construct additional gates or related facilities beyond those required in response to forecast demand as documented in the approved aviation forecast for PHX (LFA, 2003).

Construction of Crossfield Taxiways Uniform "U" and Victor "V"

Crossfield Taxiways "U" and "V" are proposed to provide taxiway connections to facilitate the movement of aircraft between the north and south side of the airport. Located west of the proposed new West Terminal (**Figure 1.1-3**), these taxiways would include structural taxiway bridges over re-aligned Sky Harbor Boulevard (see below) and modifications to existing utility and drainage systems. Construction of Taxiway "U" would require the demolition of two Delta Air Lines maintenance shops and West Economy parking facilities. Construction of Taxiway "V" would require the demolition of an existing Air Cargo Building "A", and West Economy parking lot.

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[1] Effective September 27, 2005, and following release of the Draft EIS in June 2005, America West Airlines and US Airways merged and began integrating their operations. Reference to America West Airlines remains in the Final EIS as the merger does not affect forecast or operational assumptions.

Sky Harbor Boulevard Modifications

Modifications to Sky Harbor Boulevard are proposed to accommodate West Terminal access and Crossfield Taxiways "U" and "V" to improve overall access to the terminals, cargo facilities, and parking facilities at PHX and to improve circulation within the airport roadway system. The Sky Harbor Boulevard modifications are proposed from 24th Street eastward, past the proposed new West Terminal, and to Terminal 3 (Figure 1.1-4). This project would include the construction of several new roadway bridge structures, the widening of one bridge, numerous retaining walls, and a storm drainage system. The proposed roadway system would include eastbound and westbound traffic, with arrival and departure curbs on separate levels to facilitate curbside passenger loading and unloading.

Construction of Stage 2 Automated People Mover System

Stage 2 of the Automated People Mover System (APM) would be designed to integrate with APM Stage 1 and extend westward to the West Terminal and the Rental Car Center. Stage 2 would also provide a connection to the proposed Valley Metro Light Rail Transit Station at 44th Street and Washington Street. Routing for the APM is shown in Figure 1.1-4. The proposed design of the APM would include segments above and below ground level. An APM Maintenance Facility would also be part of the Stage 2 East APM System. If Stage 1 of the APM was not constructed, Stage 2 would still be constructed to provide access to the Rental Car Center, terminals, and an APM Maintenance Facility.

Stage 1 of the APM is planned to extend from the existing EEPG westward past Terminal 4 along a central alignment, ending at Terminal 3 with stations at the EEPG, Terminal 4, and Terminal 3. Development of the APM Stage 1 is not part of this FEIS; however, the City of Phoenix has prepared a separate NEPA Environmental Assessment to evaluate the environmental impacts associated with this project. FAA issued a Finding of No Significant Impact (FONSI) for this project on August 6, 2004. The FAA has determined that Stage 1 of the APM will be built and operated regardless of whether Stage 2 is built and operated.

1.1.2 DOCUMENT ORGANIZATION

The format and content of this FEIS conforms to the requirements for an EIS established in the CEQ regulations implementing the procedural provisions of NEPA (40 CFR 1500-1508) and in the requirements of FAA Orders 5050.4A, (FAA, 1985) and 1050.1E (FAA, 2004a). This FEIS comprises four volumes. Volume 1 provides the primary components of the FEIS document while Volumes 2, 3, and 4 provide associated appendices. Listed below is a summary of the contents of each volume. Volume 1: FEIS Documentation, is comprised of ten sections, described as follows:

Chapter 1.0, **Purpose and Need** - provides introduction, describes the proposed action, site description, and provides a discussion of the purpose of the proposed improvements and why they are needed.

Chapter 2.0, **Alternatives** - provides a discussion of the alternatives analyzed as part of the environmental process. It includes a discussion of the criteria and process for evaluation of alternatives, and which alternatives will or will not be retained for detailed analysis in Chapter 4.0, Environmental Consequences.

Chapter 3.0, **Affected Environment** - provides a discussion of existing environmental conditions in areas that could be directly or indirectly affected by the proposed project.

Chapter 4.0, **Environmental Consequences** - provides a comparative discussion of the environmental effects associated with the proposed action as well as each of the reasonable alternatives identified in Chapter 2.0, Alternatives, and the No-Action Alternative.

Chapter 5.0, **Mitigation** - provides a summary of the conceptual mitigation measures developed for the proposed action.

Chapter 6.0, **Coordination and Public Involvement** - provides a discussion of the coordination and public involvement associated with the EIS process.

Chapter 7.0, **List of Preparers and List of Parties to Whom Sent** - provides information regarding the preparers of the FEIS and a list of Federal, state, and local agencies and other interested parties that received a copy of this FEIS document.

Chapter 8.0, **References** - provides a list of the references used in the preparation of this document.

Chapter 9.0, **List of Abbreviations, Acronyms, and Glossary** - provides a list of the abbreviations, acronyms, and glossary of terms used in this document.

Chapter 10.0, **Index** - provides a cross-referencing system of terms, topics, and common phrases used in this FEIS.

FEIS Technical Appendices - These volumes contain various appendices to this FEIS related to technical information, coordination, responses to comments on the DEIS, and other reference materials. The following technical appendices are included (other appendices to be added as appropriate):

Volume 2:

Appendix A - Agency Coordination

Appendix B - Aircraft Noise

Appendix C - Historic/Archaeological Resources Supporting Materials

Appendix D - Fish, Wildlife, and Plants Supporting Materials

Appendix E - Water Resources Supporting Materials

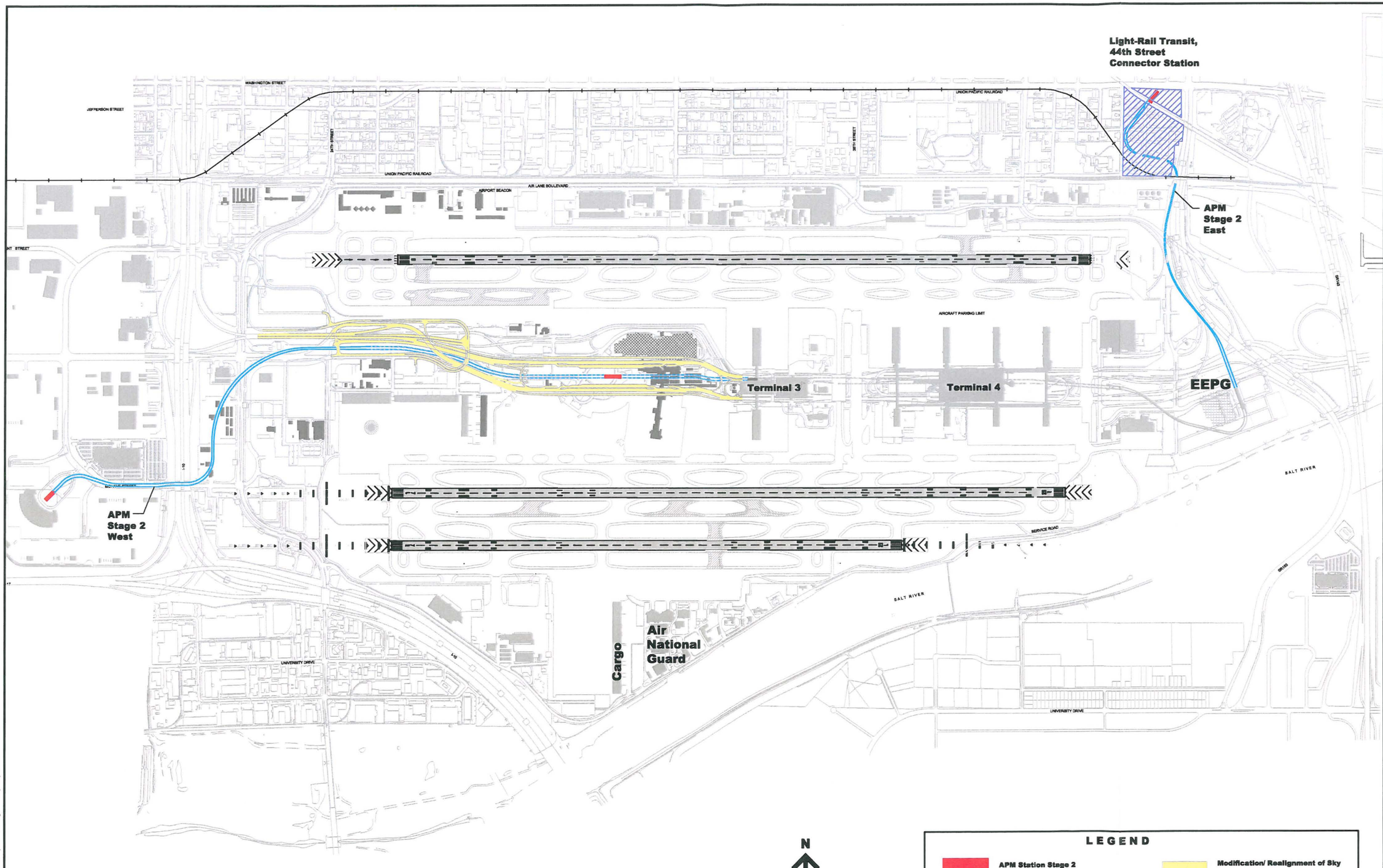
Volume 3:

Appendix F - Air Quality Supporting Materials

Appendix G - Public Involvement Materials

Appendix H - Purpose and Need Supporting Documentation

Appendix I - Energy: Aircraft Fuel Consumption



Source: West Terminal EIS Project Description, March 2004, DMJM Aviation/HDR.
2005 ALP, November 2005, Rocondo & Associates.

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APM Stage 2 and Sky Harbor Boulevard Modifications

FIGURE
1.1-4

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Volume 4:

Appendix J – Comment Response Database

Other PHX reference materials used in the development of this FEIS are too voluminous to include as appendix material for distribution with this FEIS. These materials are available for public review at PHX during regular business hours. Please contact the airport directly for access to these documents. These materials include:

- West Terminal EIS Project Description, DMJM Aviation/HDR, June 2004;
- West Terminal Development Planning and Program Criteria Document, Landrum & Brown, Inc., October 2000;
- Crossfield Taxiway Simulation Analysis, Ricondo & Associates, April 2003;
- Environmental Project Overview: Terminal 4 Concourses S1 and S2, DMJM Aviation/ HDR, December 2002;
- Terminal Area Demand/Capacity Analysis, Phoenix Sky Harbor International Airport, DMJM Aviation/HDR, June 2004;
- West Terminal EIS Future Traffic Condition - 2015 Build Alternative, DMJM Aviation/ HDR, November 2003;
- West Terminal Development Study, Appendix 3 - Terminal Program, Hirsh Associates, January 2001;
- West Terminal EIS Traffic Data Collection, HDR Engineering, Inc., June 2002;
- Terminal 2 Level of Service Evaluation, DMJM Aviation/HDR, October 2003;
- Airline Competition Plan, City of Phoenix Aviation Department, November 2003;
- Final EA for APM Stage 1, DMJM Aviation/HDR, July 2004;
- Final EA for Rental Car Center, DMJM Aviation/HDR, September 2003;
- Final EA for East Economy Parking Garages, DMJM Aviation/HDR, December 2004;
- Comment submittals received over the course of the EIS; and
- All other references used in the EIS study as described in **Chapter 8.0**, References.

1.1.3 BACKGROUND

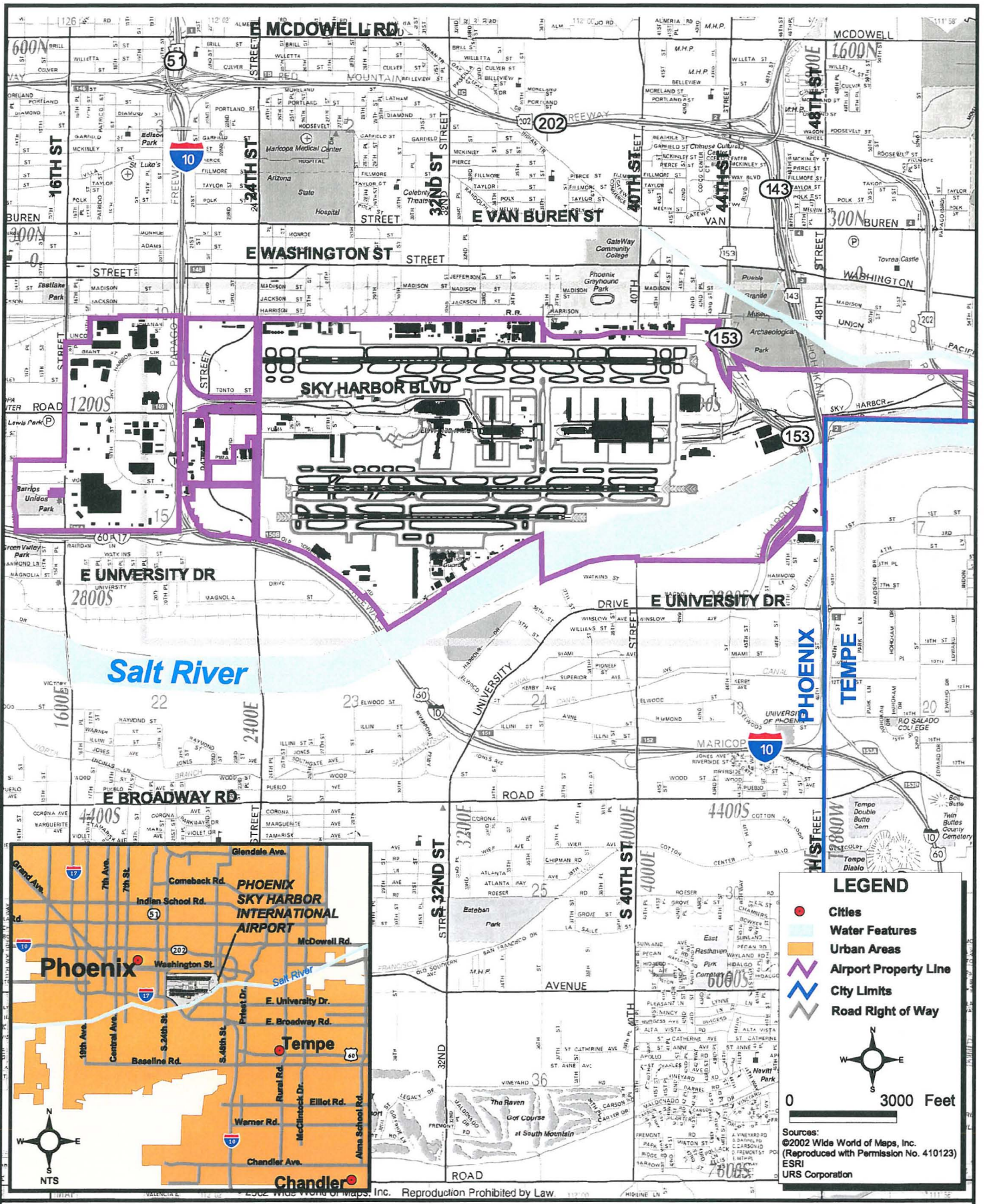
PHX is located in the City of Phoenix, Maricopa County, Arizona, approximately 5 miles east of the central business district (**Figure 1.1-5**). The airport site, which includes Sky Harbor Center, is generally bounded by State Route 153 on the east, the Salt River and I-10 on the south, 16th Street on the west, and the Southern Pacific Railroad on the north, although some airport owned property is between the railroad and Washington Street. Access to the terminals from the east and west sides of the airfield is provided via Sky Harbor Boulevard, which is separated for eastbound and westbound traffic flow.

PHX is a publicly owned airport accommodating air carrier, commuter, air taxi, air cargo, general aviation, and military aircraft operations. The City of Phoenix owns and operates PHX, along with two general aviation reliever airports (Phoenix Deer Valley and Phoenix Goodyear Airports) in Maricopa County. The airport was acquired by the City of Phoenix in 1935 from a private investment company and has grown into one of the busiest airports in the United States (FAA, 2002). In 2004, PHX was ranked 7th among U.S. airports in terms of passenger enplanements. In 1935, the airport was situated on approximately 285 acres of land. Currently, the airport encompasses approximately 3,175 acres of land. Throughout the years, significant expansion of airport facilities has occurred to meet its growing demands. In the late 1970s, the airport was expanded from a two-terminal to a three-terminal facility. Most recently, a new 7,800-foot runway (Runway 7R/25L) was constructed at the south side of the airfield and the North Runway (Runway 8/26) was extended to 11,490 feet (USDOT, 1993). The third runway project was completed in October 2000. In its current configuration, the airfield at PHX consists of three parallel east-west runways that are served by a network of taxiways, aircraft parking aprons, and hold areas (Figure 1.1-1). Two runways (Runways 7L/25R and 7R/25L) are located on the south side of the airfield and one (Runway 8/26) is located on the north side. The existing passenger terminal complex at PHX consists of Terminals 2, 3, and 4. These terminals have a combined 110 gate positions and approximately 2,704,993 square feet of floor space (Table 1.1.3-1). The City has received environmental approvals from the FAA to construct an additional 8 gates (Concourse S1) at Terminal 4, which would increase the total number of gates at PHX to 118. In the evaluation of future facility requirements performed as part of this EIS, the future gates at Concourse S1 were included in the environmental analysis presented in this EIS.

TABLE 1.1.3-1
SUMMARY OF EXISTING PHX TERMINAL FACILITIES

Terminal Facilities	Facility Area (Square Feet)		
	Terminal 2[1]	Terminal 3[2]	Terminal 4[2]
Total Aircraft Gates	14	16	80[1, 3]
Airline Space	109,705	258,623	600,621
Concession Space	42,005	61,860	88,546
Public Space	104,540	141,967	493,786
Federal Inspection Services	0	0	83,872
Other Areas	60,669	179,465	477,366
Total Terminal Area	**316,919**	**641,915**	**1,746,159[3]**

[1] West Terminal Development Planning and Program Criteria Document, Landrum & Brown, October 2000.
[2] Terminal Area Demand/Capacity Analysis, DMJM Aviation/HDR, June 2004 (modified).
[3] Terminal 4 gate total does not include 8 additional gates to be constructed on Concourse S1 that were previously approved by the FAA in a 2003 Categorical Exclusion (Cat Ex).



c1 516\\gc\c1 375-GIS Data 2\G:\Phoenix els\Applications\apr\phx els 2.apr(Figure 1.1-4, Project Location/Vicinity Map), rpf.lav, 12/14/05

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Project Location/Vicinity Map

FIGURE 1.1-5

1.1.3.1 Role of PHX in the National Transportation System

PHX is designated by the FAA as a "large-hub air carrier airport." PHX serves a primary service area consisting of Maricopa and Pinal counties, and a secondary service area including most of the State of Arizona. PHX is the largest commercial service airport in the State of Arizona in terms of scheduled departures, nonstop destinations, and passengers enplaned. In 2001, PHX enplaned approximately 17.6 million passengers with annual aircraft operations of approximately 553,000. Twenty-six commercial air carriers, including America West, Delta, Southwest, Alaska, American, Continental, Northwest, United, and Mesa service PHX. America West and affiliates and Southwest together accounted for approximately 69 percent of the total passenger enplanements at PHX during 2001. Total air cargo at PHX during 2001 was approximately 320,929 tons. Approximately 78 percent of the air cargo at PHX was freight, and the remaining 22 percent was mail. The largest all-cargo airlines currently serving PHX are FedEx and UPS. These two airlines accounted for approximately 59 percent of the freight shipped from PHX in 2001. Other cargo airlines operating at PHX include DHL, Emery, ABX Air, and BAX Global. In 2003, PHX ranked as the 5th busiest airport in the U.S. in terms of passenger enplanements.

1.1.3.2 Related Studies at PHX

Previous environmental documentation was drawn upon as background information for this FEIS. These documents include recently prepared environmental reports for other airport projects. Chapter 8.0 of this FEIS contains a full listing of all reference materials used in preparation of this FEIS. The following documents were used to address the potential individual and cumulative impacts:

- Environmental Project Overview, Terminal 4 Concourses S1 and S2. DMJM Aviation/HDR. December 2002.
- Final Environmental Assessment. Proposed Construction and Operation of an Airport Traffic Control Tower/Terminal Radar Approach Control Facility. U.S. Department of Transportation, Federal Aviation Administration. February 2003.
- Final Environmental Impact Statement, Sky Harbor International Airport Master Plan Update Improvements. Federal Aviation Administration. November 1993.
- Final Environmental Assessment, Stage 1 Automated People Mover. DMJM Aviation/HDR. May 2004.
- Final Environmental Assessment for East Economy Parking Garages. DMJM Aviation/HDR. December 2004.
- Final Environmental Assessment for Rental Car Center. DMJM Aviation/HDR. September 2003.

1.1.4 AVIATION FORECASTS

In the 1990s, PHX experienced rapid growth in passenger activity attributed to the significant growth in the local economy and the continued development of low-fare and connecting passenger air service by America West and Southwest Airlines. The number of enplaned passengers at PHX increased at an average annual rate of 5.0 percent from 1990 to 2000. In 2001, the number of enplaned passengers declined by 0.3 percent due to: (1) the nationwide economic slowdown, and (2) the events of September 11, 2001. In the period immediately following September 11, 2001, passenger activity at the airport declined significantly, consistent with the experience nationwide.

In support of this FEIS, the Aviation Demand Forecast for PHX was updated in 2002 to provide operational projections for the planning period 2005 through 2015 (LFA, 2003). The Aviation Demand Forecast was reviewed by the FAA and approved on January 6, 2003. A copy of the Aviation Demand Forecast is provided as Appendix H-1. The following sections summarize information contained in the forecast.

1.1.4.1 Passenger Enplanements

Calendar year 2001 was established as the base year for this FEIS because it was the year FAA published the NOI to prepare the EIS, conducted the scoping meetings, and began the environmental impact analysis. The NOI was published in the *Federal Register* on March 12, 2001. The FEIS evaluates the future conditions of the reasonable alternatives, including the No-Action Alternative, and their environmental consequences.

The unconstrained passenger forecast for PHX for the period 2005 through 2015 is shown in Table 1.1.4-1. For comparative purposes, enplanement data for 2002 and 2003 are also provided. Review of the 2002-2003 enplanement data indicates that the use of 2001 as a baseline year is representative of PHX activity during the 2001-2003 timeframe.

The number of enplaned passengers at PHX during 2001 (the EIS base year) was approximately 17.6 million passengers. Passenger activity at PHX is forecast to increase from approximately 17.6 million in 2001 to 25.2 million in 2015. This would reflect an average annual growth rate (AAGR) of approximately 3.0 percent. This year-over-year rate of growth mirrors the FAA's projections of nationwide domestic passenger growth for the same forecast period. The relative percentage mix of international passengers at PHX is projected to increase from approximately 3.3 percent in 2001 to approximately 4.2 percent by 2015. This projected increase is anticipated to occur as a result of the increased development of direct international service to accommodate local demand. It is projected that the share of domestic regional passengers will increase from 4.7 percent to 6.7 percent by 2015 because of the continuation of the trend to use regional affiliates to serve markets with regional jet aircraft.

TABLE 1.1.4-1
FORECAST ENPLANED PASSENGERS

	Actual[2]			Forecast		
	2001	2002	2003	2005	2010	2015
Originating Passengers[3]						
Domestic Air Carrier	9,829,338	9,794,610	10,260,209	10,584,000	12,151,000	13,627,000
Domestic Regional	193,612	229,954	259,189	309,000	416,000	522,000
Domestic Total	10,022,951	10,025,415	10,519,798	10,893,000	12,567,000	14,149,000
International	412,952	451,930	525,404	509,000	651,000	806,000
Airport Total	10,435,902	10,477,328	11,045,202	11,402,000	13,218,000	14,955,000
AAGR[1]	-3.1%	-0.4%	5.4%	3.3%	3.0%	2.5%
Percent Originating	59.4%	59.5%	59.0%	59.3%	59.3%	59.2%
Connecting Passengers[3]						
Domestic Air Carrier	6,471,836	6,395,146	6,699,840	6,910,000	7,900,000	8,860,000
Domestic Regional	523,471	591,309	666,487	757,000	971,000	1,162,000
Domestic Total	6,995,306	6,986,455	7,366,327	7,667,000	8,871,000	10,022,000
International	137,651	150,637	175,901	170,000	217,000	269,000
Airport Total	7,132,957	7,137,092	7,542,228	7,837,000	9,088,000	10,291,000
AAGR[1]	4.1%	0.0%	5.6%	3.5%	3.0%	2.5%
Percent Connecting	40.6%	40.5%	41.0%	40.7%	40.7%	40.8%
Total Enplaned Passengers						
Domestic Air Carrier	16,301,174	16,190,607	16,960,449	17,494,000	20,051,000	22,487,000
Domestic Regional	717,083	821,263	925,676	1,066,000	1,387,000	1,684,000
Domestic Total	17,018,257	17,011,870	17,886,126	18,560,000	21,438,000	24,171,000
International	550,602	602,550	701,306	679,000	868,000	1,075,000
Airport Total	17,568,859	17,614,420	18,587,432	19,239,000	22,306,000	25,246,000
AAGR[1]		0.1%	5.2%	3.3%	3.0%	2.5%

Sources: Aviation Demand Forecasts - West Terminal EIS, Sky Harbor International Airport, Leigh Fisher Associates, September 2003.

[1] AAGR = Average Annual Growth Rate.

[2] Enplaned passengers from City of Phoenix airport records.

[3] Shares of originating and connecting passengers estimated by Leigh Fisher Associates based on various data sources.

The relative percentage of connecting passengers is projected to remain unchanged throughout the entire forecast period at approximately 41 percent.

1.1.4.2 Air Cargo Activity

The forecast of air cargo at PHX is based on the following three key assumptions:

- Air cargo growth will be primarily tied to the growth of the local economy,
- All-cargo airlines will continue to account for the majority of the airfreight activity, and
- Passenger airlines will continue to account for the majority of airmail cargo movement (belly cargo).

The projection of air cargo growth at PHX is not linear, with faster year-over-year growth occurring within the first several years of the forecast period. This is primarily due to the depressed rates of growth experienced during 2003 as indicated in the PHX aviation forecast (LFA, 2003). Air cargo activity at PHX is projected to increase from approximately 320,900 tons in 2001 to 435,000 tons in 2015. This represents an average annual growth rate of approximately 2.7 percent. The relative percentage of all-cargo to mix or belly cargo is projected to remain unchanged throughout the entire forecast period at approximately 75 percent. The unconstrained air cargo activity for PHX through the year 2015 is shown in **Table 1.1.4-2**.

TABLE 1.1.4-2
ACTUAL AND FORECAST AIR CARGO (TONS)

	Actual[1]			Forecast		
	2001	2002	2003	2005	2010	2015
Freight	245,482	296,502	287,664	295,000	331,000	371,000
Mail	75,447	33,096	30,253	57,000	61,000	64,000
Total	320,929	329,598	317,917	352,000	392,000	435,000
Percent Annual Change[2]		2.6%	-3.5%	9.7%	2.2%	2.1%

Source: Aviation Demand Forecasts - West Terminal EIS, Sky Harbor International Airport, LFA, September 2003.

[1] Actual - City of Phoenix, airport records.

[2] Percent change from previous study year.

1.1.4.3 Aircraft Operations

Total aircraft operations at PHX are projected to increase from 553,310 in 2001 to 670,000 in 2015. This represents an average annual growth rate of about 1.5 percent. The average annual rate of growth for aircraft operations is less than that for passenger and cargo demand because it is assumed that as passenger demand increases within established markets, airlines will initially reallocate aircraft within their existing fleets to increase the size of the respective aircraft (i.e., additional capacity by offering more available seats) before adding additional flights. At the same time, the use of regional jets by the major and feeder airlines is anticipated to increase as a relative share of all commercial operations. The use of regional jets is anticipated to represent a continued trend in commuter and feeder airline service along intermediate-range city pair routes. There will be a continued trend to increase the average aircraft size and utilization for commercial operations, and (2) it is assumed that average growth for non-commercial operations (e.g., general aviation and military) will be less than the growth for commercial operations.

The unconstrained aircraft operations activity forecast for PHX through the year 2015 is shown in Table 1.1.4-3. Details pertaining to the assumptions and methods used to forecast aircraft operations are provided in the Aviation Demand Forecasts, West Terminal EIS (LFA, 2003).

TABLE 1.1.4-3
ACTUAL AND FORECAST AIRCRAFT OPERATIONS

	Actual[1]			Forecast		
	2001	2002	2003	2005	2010	2015
Air Carrier/ Air Taxi/Commuter	488,663	489,390	484,578	522,000	566,000	602,000
General Aviation	59,581	52,408	53,533	57,000	60,000	63,000
Military	5,066	3,973	3,660	5,000	5,000	5,000
Total	553,310	545,711	541,771	584,000	631,000	670,000
AAGR[2]		-1.3%	-0.7%	2.3%	1.6%	1.2%

Source: Aviation Demand Forecasts - West Terminal EIS, Sky Harbor International Airport, LFA, September 2003.
[1] Actual - Federal Aviation Administration.
[2] Average Annual Growth Rate.

As part of the forecast development process at PHX, the FAA evaluated the need to develop a constrained forecast for airport operations (LFA, 2003). The purpose of the forecast evaluation was to determine if the airport's runway system would have sufficient capacity to accommodate the number of operations projected in the unconstrained forecast, which encompassed the period 2002 through 2015. The forecast analysis utilized FAA approved Runway and Capacity Delay Models. Table 1.1.4-4 shows the estimates of average annual delay that were developed using the FAA models. The delay values shown represent the average excess travel time aircraft would incur as a result of the presence of landing and departing aircraft in the system. As shown in the table, average annual delays are expected to increase as the level of aviation activity increases at the airport, rising from approximately 2 minutes per operation in 2002 to approximately 15 minutes per operation in 2015.

TABLE 1.1.4-4
AVERAGE ANNUAL DELAY ESTIMATES

Year	Aircraft Operations	Average Annual Delay (minutes per operation)
2002	541,682	2.1
2005	584,000	3.0
2010	631,000	7.5
2015	670,000	15.0

Source: LFA, March 2003.

As stated previously, documents published by the FAA indicate that generally runway capacity may constrain growth in aviation activity when aircraft delays reach levels of between 18 and 20 minutes per operation. As Table 1.1.4-4 shows, estimated future average annual delay at PHX does not exceed 15 minutes at any point during the planed period for the EIS (2015). Accordingly, the results of the capacity analysis indicate the three-runway system at PHX would be capable of accommodating growth in aviation

activity as projected in the unconstrained demand forecast. The projected growth in the number of aircraft operations at PHX is independent of the terminal facilities to be developed as part of the ADP and would also occur under the No-Action scenario, although the level of service to passengers would be significantly reduced (see **Section 1.1.1**).

On an annual basis, the FAA prepares an official forecast of aviation activity called the Terminal Area Forecast System (TAF). As part of the TAF projections, detailed forecasts are prepared for major users of the National Aviation System that include large air carriers, air taxi/commuters, general aviation, and the military. To verify that the estimates of aviation activity projected in the PHX forecast were within the acceptable range as defined by FAA, an Aviation Forecast Sensitivity Analysis was performed to compare the West Terminal EIS forecast and FAA's January 2005 TAF for PHX. FAA guidance relating to the suitability of forecasts for use in environmental and planning decisions requires that a sponsor's forecast be within 15 percent of the TAF in the 10-year forecast period (Revision to Guidance on Review and Approval of Aviation Forecasts, FAA, 2004). Results of the comparison analysis found that the aviation forecast developed for PHX was within the range of FAA acceptability for use in preparation of the FEIS. A copy of the Aviation Forecast Sensitivity Analysis is provided in **Appendix H** of this FEIS.

1.2 PURPOSE AND NEED FOR THE PROPOSED IMPROVEMENTS

This section of the FEIS describes the Purpose and Need for the proposed project at PHX and identifies the Federal actions proposed by the FAA. The purpose and need of a proposed action is the primary foundation for the identification of reasonable alternatives and the evaluation of impacts of the alternatives. The regulations implementing NEPA indicate that EISs "shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." The proposed Federal actions being considered in this FEIS include FAA's approval of the ALP that depicts the proposed airfield improvements; determination of effects upon safe and efficient utilization of navigable airspace; determination that the airport development is reasonably necessary for use in air commerce or in the interest of national defense; approval of developments to the airport certification manual; continued coordination with the City of Phoenix; and determination of potential eligibility for Federal funding or approval for use of passenger facility charges to assist in funding the proposed projects. The ALP identifies major redevelopment items that constitute the City of Phoenix's current ADP project proposal, including the construction of terminal facilities, crossfield taxiways, Stage 2 of the APM, roadway improvements, and associated projects. These projects have been previously described in **Section 1.1.1** of this FEIS. The potential environmental impacts associated with these projects, reasonable alternatives, and other cumulative actions, are detailed in **Chapter 4.0**, Environmental Consequences, of this FEIS.

The City of Phoenix (Sponsor) is proposing airside and landside improvements associated with the ADP to meet the projected demand at PHX and alleviate congestion and shortfalls of existing facilities, particularly with respect to terminal facilities, resulting in an imbalance with the airport's airside capacity. In comparison with the No-Action Alternative, the proposed roadway improvements and APM system would improve the efficiency of traffic and passenger movements, and would enhance air quality by reducing surface traffic on airport roadways. The proposed ADP would provide an efficient level of service to passengers, airlines, and tenants consistent with historical standards.

The purpose and need for the proposed Federal actions is to 1) meet the needs of the National Airspace System, 2) improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers (LFA, 2003), 3) maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time, and 4) improve access to the airport and the efficiency of the on-airport roadway system. The proposed improvements would meet the objective of the City of Phoenix to accommodate forecast demand while balancing the capacity of airside and terminal facilities and continuing to provide an acceptable level of service to passengers and tenant airlines consistent with historical practice at PHX. **Table 1.2.1-1** provides a summary of the purpose and need for each of the proposed improvements in relation to overall project objectives.

1.2.1 TERMINAL PROJECTS

With the existing terminal and airfield configuration at PHX, the ability of landside facilities to effectively and efficiently process passengers at the desired level of service is less than the capacity of the airfield to move passengers into and out of the airport. This imbalance limits the overall performance of the airport. The differential between airfield capacity and the ability of the landside facilities to process passengers will become more severe as operations increase, consistent with the FAA approved aviation forecast for PHX (LFA, 2003).

TABLE 1.2.1-1
PURPOSE AND NEED SUMMARY

Proposed Action	Description of Proposed Project	Purpose and Need
Demolition of Terminal 2 and Ancillary Facilities	Demolition of existing Terminal 2 and associated facilities.	To more efficiently accommodate future aviation demand and improve the safety and efficiency of on-airport roadways.
Develop the West Terminal	A 33-gate facility located west of the existing Terminal 3. Terminal would be a multi-level central terminal facility with concourses containing 33 gates. The terminal would include a parking garage and other supporting facilities as required for passenger processing and air carrier operations.	To improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers.
Modifications to Terminal 4, Concourse N4 International Gates	N4 would be modified to better accommodate combined domestic and international operations of America West. Other international operations would be relocated to the new West Terminal.	To improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers.
Develop Crossfield Taxiways "U" and "V"	Construction of two Crossfield Taxiways "U" and "V."	To maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time.
Sky Harbor Boulevard Modifications	Develop new primary airport access roadway system to and from I-10 and Buckeye Road via Sky Harbor Boulevard.	To improve access to the airport and efficiency of the on-airport roadway system.
Develop Stage 2 of the Automated People Mover (APM) System	Stage 2 APM would be constructed from the APM Stage 1 station in Terminal 3 westward to the West Terminal and Rental Car Center (RCC). Stage 2 would also be constructed from the APM Stage1 at the East Economy Parking Garage northward to the Valley Metro Light Rail Transit (LRT) system.	To improve access to the airport and efficiency of the on-airport roadway system.

Source: URS, 2004.

Level of service refers to a range of established values, which combine both qualitative and quantitative criteria relative to comfort and convenience and provide an effective measure of how terminal facilities accommodate passenger demand. Level of service is normally expressed as a measure of either (1) passenger inconvenience (e.g., waiting times or missed flights), or (2) the space, size, or number of facilities available for processing passengers (e.g., terminal building are in square feet per passenger or the ticket counter length in linear feet per passenger). **Table 1.2.1-2** provides a summary of the level of service guidelines that have been identified by PHX for the continued maintenance of established level of service consistent with historical practice at the airport.

Passenger movements (enplaned passengers) at PHX are forecast to increase to approximately 25.2 million passengers per year by 2015, an increase of approximately 30 percent over the 2001 levels documented in the FAA approved aviation forecast for the airport (LFA, 2003). The 2015 forecast of 25.2 million enplaned passengers represents a 26 percent increase over the reported 2003 enplanement level of 18.6 million passengers. Aircraft operations are projected to grow from approximately 553,300 in 2001 to 670,000 in 2015. Based on the projected growth in passenger demand there is a demonstrated need for additional gate capacity at the airport (DMJM Aviation, 2004). Due to the poor condition of Terminal 2 and limited ability to economically and efficiently expand existing terminals, the City of Phoenix has proposed the development of new terminal facilities that would accommodate projected levels of passenger demand through 2015. This would provide a balance between airfield capacity and passenger processing capabilities, and provide the ability for the airport to maintain a passenger level of service consistent with historical practice. The proposed facilities would require the demolition of Terminal 2, development of the West Terminal, and modifications to Concourse N4 in Terminal 4, where all arriving international operations and passengers at PHX are currently processed.

The demand for airline service at PHX is created by the need for air transportation in the region, and not by the condition or size of the terminal facilities at the airport. As a consequence, it is assumed in this FEIS that the same number of enplaned passengers and aircraft operations would need to be processed in 2015 under the No-Action as under any of the other alternatives evaluated in this FEIS. The assumption that approximately the same level of demand would occur with the No-Action Alternative as with the other alternatives is borne out by experience at other airports such as LaGuardia Airport in New York and John Wayne Airport in Orange County, California, which are operating at levels of service lower than those recommended by the FAA, yet the number of passengers continues to increase.

In response to lower levels of service, passengers may change their behavior in terms of when and how they arrive at the airport, but they are unlikely to base their decisions of whether or not to travel on the level of service provided. As facilities become more crowded and the level of service at PHX continues to worsen over time, it is possible that a percentage of potential passengers would elect to use an airport other than PHX. Airport management may also undertake actions in response to lower levels of service. These demand management activities could enable the airport to accommodate the demand safely, without undue restrictions, while continuing to maintain acceptable levels of service. At this point, however, there is no way to predict with any degree of certainty when or to what extent passenger diversion might occur, if at all. Therefore, it is not possible to quantify the degree to which a reduced level of service at the airport would alter the FAA accepted aviation forecast and reduce the need for additional terminal facilities.

TABLE 1.2.1-2
LEVEL OF SERVICE GUIDELINES

Objective	Basis for Objective
Maximize Utilization of Contact Gates for Passenger Processing	The existing system of terminal level contact gates offers airline passengers the greatest level of comfort and convenience. The use of contact gates is of critical concern at PHX due to the extreme summer meteorological conditions when daytime temperatures frequently exceed 105 degrees and can remain at excessive levels throughout the evening. In addition, the ability to shelter PHX passengers from the monsoon-like seasonal storms (dust, rain, lightning) is also a primary consideration. Based on the desire by the City of Phoenix to maintain the highest level of service to airport users consistent with that historically provided by the airport, all terminal facility development should incorporate the use of departure-level contact gates.
Maintain Compliance with the Americans with Disabilities Act of 1990 (ADA)	The efficient, convenient, and comfortable transfer of passengers with disabilities between the terminal facilities and aircraft is considered a prime factor in determining the extent and quality of service offered by airport facilities. Title III of the ADA requires places of public accommodation be designed, constructed, and altered in compliance with established accessibility standards. The use of contact gates precludes the need for disabled passengers to utilize and navigate circuitous pathways, ramps, and stairways that by design, offer challenges to the transfer of passengers with disabilities. The vertical transfer of passengers between the terminal departure level and the apron loading area utilizing walkers, wheelchairs, or motorized carts requires specialized lifts to provide safe passenger access to certain terminal doorways or aircraft cabin door sills. The extreme summer temperatures experienced at PHX would further exacerbate the level of discomfort to disabled passengers using remote gates in lieu of contact gates.
Limit Use of Aircraft Auxiliary Power Units	The availability of pre-conditioned air and electrical service at the contact gate jetway and within parked aircraft during the enplane/deplane operations provides passengers and airlines with a higher level of service and reduces the need for portable air conditioning and power generating units. The use of remote hardstand gate positions would require an extensive network of portable or permanent apron-based auxiliary power and air conditioner units. While feasible, this remote gate system offers limited freedom in on-demand relocation of remote gate positions, and takes up apron areas required for aircraft taxi movement and aircraft service vehicle access. In addition, the use of portable generating units and air conditioners would result in an increased level of onsite air emissions and noise levels. The added presence of objects and mobile carts could present a safety hazard when moving around the active apron areas.
Limit Use of Ground-Based Passenger Transport Vehicles	The use of remote hardstand gate positions at locations distant to the departure level hold room may require the use of transport vehicles such as buses or trams. Such vehicles would use traditional automotive gasoline or diesel-powered engines that would increase airport air emissions and could result in additional air quality impacts. The use of alternative Liquid Propane Gas (LPG) would serve to reduce these emissions, but would not address induced ground-based aircraft operational delays generated by vehicular traffic on and around the terminal apron, apron-area taxilanes and aircraft taxi areas.
Provide a Secure Environment for Airside Operations	The increasing level of airside security concerns within the terminal, airside, and apron areas at airports impose further restrictions and considerations for limiting terminal-to-aircraft passenger transfer using remote hardstand gate positions. When such activities occur, additional airline, airport, and security personnel are required to escort and monitor the movements of each passenger along pre-planned routes between terminal and airplane. This results in additional delays at the airport and can be stressful for airline passengers.

Source: URS, 2004.

1.2.1.1 Demolition of Terminal 2

Terminal 2 was originally constructed in 1962 and is nearing the end of its useful service life. Due to its age and condition, the terminal cannot be economically expanded to meet existing and projected future passenger and air carrier requirements. The existing terminal facility has a number of structural and operating systems that would require significant retrofit to satisfactorily accommodate additional passenger activity. These deficiencies have been documented by the City of Phoenix in a *Terminal 2 Deficiency Report* (DMJM Aviation/HDR, 2003). A copy of the *Terminal 2 Deficiency Report* is provided in **Appendix H-2**.

As detailed in the *Terminal 2 Deficiency Report*, the potential for extending the service life of Terminal 2 and improving the services and facilities available to passengers is affected by the age of the structure, the lack of adequate space for tenant airlines, and the presence of asbestos-containing materials. A number of areas within Terminal 2 are not in compliance with the Americans with Disabilities Act (ADA) and would require significant interior modifications if the service life of the facility were to be extended.

Although some renovations to Terminal 2 have been completed to maintain operations and appearances, additional improvements to enhance passenger service levels to a point similar to that provided in Terminals 3 and 4 have been postponed due to the limited future service life of Terminal 2. The *Terminal 2 Deficiency Report* contained in **Appendix H-2** provides a listing of improvements required in Terminal 2 to improve the level of service to a point approaching that in Terminal 3.

The level of service currently provided in Terminal 2 and its ability to process additional passengers have been evaluated by the City (DMJM Aviation/HDR, *Terminal 2 Level of Service Evaluation*, October 2003). Results of the evaluation indicate the terminal is currently operating below the minimum service levels desired by the City. Results further suggest the current passenger activity level of 1.7 million annual enplaned passengers is at or close to the limit of Terminal 2 to efficiently process airline passengers. Additional increases in Terminal 2 passenger demand would reduce the level and quality of service provided to the traveling public. The projected future spoke domestic passenger activity levels for Terminal 2 airlines are approximately 3.4 million annual enplaned passengers (DMJM Aviation/HDR, 2003). Spoke domestic airline passengers are those passengers flying on an airline that operates at and provides service to PHX but maintains its hub at other airports throughout the country. Accommodating this number of passengers with the existing Terminal 2 facilities would necessitate a significant reduction in efficiency and convenience to spoke domestic airline passengers. As a result of the physical limitations of Terminal 2 facilities and operational inefficiencies, airlines utilizing the terminal could be placed at a competitive disadvantage as compared to other airlines operating in Terminal 3 or Terminal 4.

In addition to the structural/operational deficiencies noted above, the southernmost gates of Terminal 2 preclude movement of aircraft larger than Airplane Design Group IIIa on Taxiway "D", south of the terminal. Demolition of Terminal 2 would remedy the taxiway object free area (TOFA) restrictions on Taxiway "D" (see **Section 1.2.2.2**).

Because of the structural and operational deficiencies noted above and the limited opportunities for expansion, both demolition of Terminal 2 and development of a replacement facility are needed.

1.2.1.2 Development of the West Terminal

The purpose of developing the West Terminal is to improve the efficiency of landside passenger handling facilities to accommodate forecast demand and maintain an acceptable level of service to passengers. The West Terminal is needed to accommodate operations for spoke domestic airlines that are currently located in Terminal 2 and future excess demand for spoke domestic airlines currently operating in Terminal 3. As discussed in Section 1.2.1.1, Terminal 2 cannot be renovated cost effectively and would be demolished resulting in the loss of 14 gate positions. The West Terminal would replace the 14 gates currently in Terminal 2 and would also provide terminal facilities to accommodate excess demand from Terminal 3. When operational, all international arrivals and departures (except America West international flights) would be moved to the West Terminal from their present location in Terminal 4, Concourse N4. Projections of future spoke domestic and international passenger activity at the proposed West Terminal are shown in Table 1.2.1-3.

TABLE 1.2.1-3
FUTURE DEMAND FOR WEST TERMINAL
SPOKE DOMESTIC AND INTERNATIONAL AIRLINES

Annual Enplanements	Projected Passenger Activity for West Terminal Spoke Domestic and International Operations		
	Forecast Year Activity		
	2005	2010	2015
Domestic	3,462,000	4,351,000	4,958,000
International	545,000	639,000	749,000
Combined	4,007,000	4,990,000	5,707,000

Source: Hirsh, J., Memorandum, PHX West Terminal Program, April, 2001.

Construction and operation of the West Terminal is needed for the airport to accommodate the projected increase in enplanements without a reduction in the level of service provided to passengers. Level of service is a measure of how well the passenger demand is served and is defined as the quality or conditions that passengers experience at a facility. Level of service can refer to a range of established values combining both qualitative and quantitative criteria relative to comfort and convenience. It is usually expressed as a measure of time or area that would provide acceptable passenger flow, minimal delays, a reasonable level of comfort, and a desirable threshold of air traveler's experience. At PHX, the historical performance of Terminal 3 with respect to passenger processing efficiency and convenience is considered the benchmark for level of service standards. This benchmark includes factors such as the sole use of contact gates (no non-contact gates), modern passenger queuing and processing space, secure and non-secure concession/retail space, adequate space for Transportation Security Administration (TSA) facilities, and convenient and accessible amenities.

With the existing airfield and terminal configuration at PHX, there is an imbalance in the capacity of the airfield as compared to the ability of landside facilities to effectively and efficiently process passengers. This imbalance will become more severe as the number of operations at PHX increases as projected in the FAA approved forecast of aviation activity for the airport (LFA, 2003). The capacity of the proposed

West Terminal, Terminal 3, and Terminal 4 to accommodate future passenger demand was evaluated in a Terminal Area Demand/Capacity Analysis Report (see Appendix H). Data for the projection of enplaned passengers used in this analysis were developed from the Aviation Demand Forecasts, West Terminal EIS (LFA, 2003) and the West Terminal Development Planning and Programming Criteria Document (L&B, 2000). Results of the demand/capacity analysis indicate the proposed West Terminal development concept would effectively meet the projected demand for spoke domestic airlines and international operations projected through the 2015 planning period. If the West Terminal were not developed, the passenger demand from domestic airlines operating at PHX would exceed the capability of the existing terminal facilities by as much as 2.8 million passengers per year toward the end of the forecast period (2015) assuming the desired level of service at the airport is maintained. In addition, the growth of international air carrier service at PHX could be constrained due to limitations in passenger processing and FIS facilities. During 2001, the peak-hour activity for deplaned international travelers in Terminal 4 was 360 passengers. This number is forecast to increase to 470 passengers in 2015 (DMJM Aviation/HDR, June 2004).

1.2.1.3 Modifications to International Concourse N4, Terminal 4

The purpose of the proposed project is to improve the efficiency of landside passenger handling facilities to accommodate forecast demand and maintain an acceptable level of service to passengers. The improved efficiency of Concourse N4 would not in and of itself lead to increased operational levels at PHX, but would enable PHX to accommodate increased service provided by airlines at PHX in response to increased demand. Implementation of the proposed project would result in the relocation of all air carriers having international arrivals and departures (with the exception of America West) to the proposed West Terminal. New FIS facilities would be constructed in the West Terminal to accommodate these operations.

All international arrivals and departures at PHX presently occur at six gates located at the north end of Concourse N4 on Terminal 4. These gates are also utilized for domestic operations, primarily by America West and Southwest Airlines. Southwest Airlines operations currently accommodated in Concourse N4 will move to the S2 concourse upon completion. During 2001, the number of enplaned international passengers at PHX was approximately 550,000. International passenger enplanements are forecast to grow at an annual rate of approximately 3.6 percent through 2015 to approximately 1,075,000 per year (LFA, 2003). To meet this projected demand, modifications to the existing international passenger facilities and development of new facilities within the West Terminal are needed to provide additional processing capacity, improve the level of service to international passengers, provide additional space for FIS operations, and support increases in service by tenant airlines in response to demand.

Within Concourse N4, FIS processing facilities for deplaning international operations are located on the apron and basement levels of the concourse. Due to the location, the potential to expand international passenger processing and security facilities is negligible. Both the limited size of the existing FIS facilities and the limited holdroom area on the concourse level, result in delays in the accommodation of international passenger service at PHX.

The proposed project would relocate all international operations, except those operated by America West, to the West Terminal (America West will remain in Terminal 4). The increased terminal space for international operations available to America West would allow the air carrier to service an increased number of international destinations by the feeder routes and by transient operations at PHX in response to increasing passenger demand at the desired level of service. Security and facility design parameters would preclude the use of these gates for domestic operations.

1.2.2 AIRFIELD PROJECTS

As previously discussed in **Section 1.1.4.3**, as aviation demand and the numbers of passengers and aircraft operations at PHX increase, operational delays are forecast to increase (LFA, 2003). The purpose of the proposed taxiway projects is to maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time.

1.2.2.1 Dual Crossfield Taxiways

The purpose of dual crossfield taxiways (Taxiways "U" and "V") is to maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time. The added taxiways would not increase the number of annual aircraft operations at PHX. However, development of dual crossfield taxiways would improve the ability of FAA air traffic control to move aircraft more effectively between the north and south sides of the airport. More efficient movement of aircraft would reduce delays and provide the added benefit of improving air quality by reducing taxi delays which contribute to the time aircraft are required to operate at a less efficient operating level. The operational benefits of the proposed crossfield taxiways were evaluated in a simulation analysis performed by the City of Phoenix (Ricondo & Associates, April 2003). These analyses simulated existing and future conditions based on forecast operation levels and the airfield with and without the proposed taxiways. The results of the analyses provided information on the calculated average ground delay and average operating times for aircraft arrivals and departures. Results of the simulation analysis are provided in **Appendix H** and discussed below.

Results of the simulation analyses (**Table 1.2.2-1**) indicate that, for the existing airfield, average operating time for ground operations at PHX would increase from 8.5 minutes per aircraft in 2002 to 16.8 minutes per aircraft in 2015. Results of the simulation analysis for the year 2015 with the addition of the proposed crossfield taxiways and West Terminal indicate that the average operating time for all ground operations (16.2 minutes per aircraft) at PHX would be reduced by an average of 0.6 minutes per aircraft. With the proposed improvements, departing aircraft would experience the greatest reduction in average operating time with an average savings of 1.2 minutes per aircraft.

Prior to incorporating this information into the FEIS, the Sponsor performed an economic analysis to evaluate the potential benefits of the proposed project. The FAA and their third party contractor performed an independent review of the economic benefit analysis to determine if the input parameters and results were consistent with industry standards and analytical techniques.

TABLE 1.2.2-1
SIMULATION ANALYSIS
CROSSFIELD TAXIWAY

Airfield Description	Year	Average Day Peak Month (ADPM) Operations	Arrivals						Departures						All Operations					
			Average Delay (minutes per aircraft)			Average Operating Time (minutes per aircraft)			Average Delay (minutes per aircraft)			Average Operating Time (minutes per aircraft)			Average Delay (minutes per aircraft)			Average Operating Time (minutes per aircraft)		
			Ground	Air	Total	Ground	Air	Total	Ground	Air	Total	Ground	Air	Total	Ground	Air	Total	Ground	Air	Total
Existing airfield with the addition of Concourses S1 and S2, the relocation of Swift Aviation to the South General Area, and the extension of Taxiway C[1]	2002	1,508	0.1	1.1	1.2	6.3	25.8	32.3	2.8	0.0	2.8	10.8	14.0	24.8	1.4	0.6	2.0	8.5	19.9	28.5
	2010	1,800	0.3	1.7	2.0	6.5	26.3	32.9	7.2	0.0	7.2	15.0	14.0	29.0	3.7	0.9	4.6	10.8	20.2	30.9
	2015	1,910	0.8	2.1	3.0	7.1	26.7	33.8	18.8	0.0	18.8	26.6	13.9	40.5	9.8	1.1	10.9	16.8	20.3	37.2
Existing airfield with the addition of the proposed crossfield taxiways and the proposed West Terminal	2002	1,508	0.1	1.1	1.2	6.2	25.8	32.1	2.8	0.0	2.8	10.6	14.0	24.7	1.4	0.6	2.0	8.4	19.9	28.4
	2010	1,800	0.3	1.7	2.0	6.5	26.3	32.8	7.0	0.0	7.0	14.7	14.0	28.7	3.6	0.9	4.5	10.6	20.1	30.8
	2015	1,910	0.8	2.1	2.9	7.0	26.7	33.7	17.7	0.1	17.7	25.4	13.9	39.3	9.2	1.1	10.3	16.2	20.3	36.5

Source: Crossfield Taxiway Simulation Analysis, Phoenix Sky Harbor International Airport, Ricondo & Associates, Inc., April 2003.
Note: Numbers may not add due to rounding.
[1] Swift Aviation, a FBO, relocated to the South General Aviation area at PHX late in FY04, following completion of the taxiway analysis. Concourses S1 and S2 will be constructed prior to completion of the ADP and have been approved for construction in a separate NEPA analysis.

Results of the economic analysis indicate that the reduction in average operating time would result in substantial economic benefit to passengers and air carriers. The estimated economic benefits for airside operations include the value of passenger time travel savings and annualized per minute aircraft operating cost savings. Economic analysis performed by the City of Phoenix (Ricondo & Associates, November 2003) indicates that construction of the proposed taxiways and West Terminal would result in a cumulative economic benefit of approximately $154.9 million (present value). This economic benefit would result from aircraft operating time savings that would produce the greatest reductions in aircraft operating costs and increases in passenger travel time savings compared to the existing airfield. For this analysis the airport-specific weighted per minute aircraft operating cost was calculated to be $38.23 in 2015. The value of passenger time was estimated using recommended values contained in the FAA Office of Aviation Policy and Plans publication titled *Economic Values for Evaluation of FAA Investment and Regulatory Decisions* (June 1998) and *Revised Guidance of Valuation of Travel Time in Economic Analysis* provided by the Office of the Secretary of Transportation in a memorandum dated February 11, 2003. The recommended value for passenger time for business travelers is $40.10 per hour and the recommended value for leisure travelers in $23.20 per hour. A copy of the economic benefit analysis is provided in **Appendix H**. A reduction in taxi time and ground delay would also provide for a reduction in air emissions. This would result from the reduced operating time required for aircraft to move to and from the terminal facilities and runways.

1.2.2.2 Removal of Taxiway Object Free Area Obstructions

The southernmost gates on Terminal 2 are in a location that does not allow effective use of the existing taxiway system. Based on current taxiway design standards, the Taxiway Object Free Area (TOFA) for Taxiway "D" is 320 feet, or 160 feet either side of the taxiway centerline. The existing distance between the Taxiway "D" centerline and the southernmost edge of the Terminal 2 concourse is 155 feet. Because of this non-standard safety setback condition, certain aircraft, such as ADG V having larger wingspans are required to utilize inner Taxiway "E" when taxiing north of, and parallel to, Runway 7L/25R. This requirement results in operational restrictions and capacity reductions on the parallel taxiway system. Improvements to the mid-field terminal system to eliminate such taxiing restrictions would optimize the capacity and throughput of the existing runway/taxiway system.

1.2.3 SURFACE TRANSPORTATION PROJECTS

Two surface transportation projects are included within the proposed project: the reconfiguration of Sky Harbor Boulevard and development of Stage 2 of the APM. The reconfiguration of Sky Harbor Boulevard is needed to allow for construction of the dual crossfield taxiways (see **Section 1.2.2**). Realignment of the roadway would also allow for construction of the West Terminal, which would be sited at the center of the north and south runways. Development of the APM Stage 2 would provide a needed westward connection to the future APM Stage 1 at Terminal 3 and provide service to the West Terminal facilities and the RCC. Stage 2 of the APM would also provide an eastern connection from the East Economy Parking Garage to the Valley Metro LRT system.

1.2.3.1 Sky Harbor Boulevard Modifications

Sky Harbor Boulevard serves as the primary access route to PHX. The realignment of Sky Harbor Boulevard would improve access to the airport and efficiency of the on-airport roadway system. The utilization of Sky Harbor Boulevard by airline passengers is projected to generate approximately 101,200 passenger trips per day by 2015 (*West Terminal EIS Future Traffic Conditions 2015 No Build Alternative,* HDR Engineering, Inc., November 2003). The number of daily employee trips and service/cargo/construction trips will also increase to approximately 52,000 and 16,000 trips per day, respectively. Cut-through traffic presently accounts for approximately 22 percent of the daily traffic at PHX and is also expected to increase during the forecast period (HDR Engineering, June 2003). Cut-through traffic is non-airport-related ground vehicle traffic passing through the airport without any intermediate stops for airport-related purposes. The reconfiguration of Sky Harbor Boulevard would facilitate construction of the dual crossfield taxiways "U" and "V".

The functionality of the existing roadway system with projected future traffic volumes has been assessed by the City of Phoenix (HDR Engineering, Inc., 2003) and validated by the FAA and their third part contractor. Results of the assessment are summarized below.

- The Buckeye Road/24th Street, Buckeye Road/Copperhead Drive, and the Sky Harbor Boulevard/Terminal 2 Access Road Intersections (Table 1.2.3-1) would operate with unacceptable levels of delay in 2015.
- Several sections of Sky Harbor Boulevard are projected to experience high to severe levels of congestion during peak periods, particularly between the limits of Terminal 2 and Terminal 4.
- Traffic along Buckeye Road is projected to increase significantly in the future. This roadway would accommodate primarily passenger traffic to/from the south via I-10 as well as traffic using 24th Street.

Operation of the airport's roadway system at the levels indicated in the assessment report would negatively impact the level of service provided by the airport to passengers and tenant airlines.

1.2.3.2 APM Stage 2 Development

PHX presently has FAA approval and is planning Stage 1 of the APM to provide service from the East Economy Parking Garage to Terminals 3 and 4. Development of Stage 1 of the APM is not a part of this EIS and would continue regardless of the outcome of this EIS.

The purpose of Stage 2 APM development is to improve access to the airport and efficiency of the on-airport roadway system. Stage 2 of the APM would also provide an eastward connection from the east terminus of APM Stage 1 at the East Economy Parking Garage to the Valley Metro LRT system. This connection would allow airport passengers to access PHX from a number of locations throughout the area without using the roadway system, thus reducing roadway congestion. Any reduction of roadway traffic and congestion would also result in a reduction in vehicle emissions. The proposed APM would aid in the reduction of air quality impacts through the reduction of vehicular traffic on surface roadways. In addition, APM Stage 2 would encourage the development of intermodal connections set forth in FAA policies 49 USC 47101 (a)(5).

TABLE 1.2.3-1
INTERSECTION ANALYSIS FOR EXISTING AND FUTURE NO-BUILD CONDITIONS

Intersection	Existing Condition (2002)				Future Condition (2015)			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Avg Delay (sec)	LOS[1]	Avg Delay (sec)	LOS	Avg Delay (sec)	LOS	Avg Delay (sec)	LOS
24th St/Air Lane	16.5	B	16.1	B	30.8	C	17.8	B
24th St/ Sky Harbor Circle North	18.9	B	19.4	B	25.1	C	39.3	D
24th St/Buckeye Rd	26.8	C	33.0	C	**	F	**	F
24th St/ Sky Harbor Circle South	12.8	B	13.3	B	24.6	C	25.5	C
24th St/Old Tower Rd	8.9	A	9.7	A	15.6	B	21	C
Buckeye Rd/ Copperhead Rd	26.3	C	25.2	C	**	F	**	F
Sky Harbor Blvd/ Terminal 2 Access Rd	28.1	C	20.0	B	**	F	**	F

1. Level of service (LOS) is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal conditions. LOS A describes operations with very low delay, up to 10 seconds per vehicle. LOS B describes operations with delays ranging from 10 to 20 seconds per vehicle. Delays corresponding to LOS C, D, E, and F range from 20-35, 35-55, 55-80, and >80 seconds per vehicle, respectively.

** Denotes intersection delay exceeds 80 seconds per vehicle.

Sources: West Terminal EIS Future Traffic Conditions 2015 No Build Alternative, HDR, June 2003.
West Terminal EIS Existing Conditions Analysis, HDR, November 2002.

1.2.4 PROPOSED FEDERAL ACTIONS

- Approval of the ALP to depict the proposed airfield improvements and various other airfield development components pursuant to 49 USC 40103(b) and 47107(a)(16). The ALP, depicting the proposed improvements, has been processed by the FAA to determine conformance with FAA design criteria and implications for Federal grant agreements (refer to Title 14, Code of Federal Regulations (CFR) Parts 77 and 157).

- Determination of the effects of the proposed projects upon the safe and efficient utilization of navigable airspace pursuant to 14 CFR Parts 77 and 157.

- Determination under 49 USC 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interests of national defense.

- Approval of the appropriate amendments to the airport certification manual pursuant to 14 CFR Part 139 and modification, as required, to the airport security plan pursuant to 14 CFR Part 107 (49 USC 44706).

- Continued close coordination with the City of Phoenix and appropriate FAA program offices, as required, to maintain aviation and airfield safety during construction pursuant to 14 CFR Part 139 (49 USC 44706).

- Determination of potential eligibility for Federal assistance under the Federal grant-in-aid program authorized by the Airport and Airway Improvement Act of 1982, as amended and/or for use of passenger facility charges for implementation of the airfield safety and airport development projects described in the City of Phoenix's Aviation Facility Plan, pursuant to USC 47101 et. seq. and 49 USC 40117.

Chapter 2.0
Alternatives

CHAPTER 2.0
ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the alternatives evaluation and screening process conducted by the Federal Aviation Administration (FAA). It presents a discussion of: 1) the alternatives considered, 2) the reasoning why some alternatives were screened and eliminated from further analysis, 3) the reasonable alternatives that were screened and retained for detailed evaluation, and 4) a comparative analysis of those reasonable alternatives subjected to a detailed environmental impact evaluation.

The Council on Environmental Quality (CEQ) regulations (40 CFR Section 1502.14) implementing the National Environmental Policy Act of 1969 (NEPA), stipulate the alternatives analysis is the "heart" of the EIS. Those regulations require the Federal decision-makers to perform the following tasks:

- Rigorously explore and objectively evaluate all *reasonable* alternatives, and, for those alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated;
- Devote substantial treatment to each alternative considered in detail, including the proposed project, so reviewers may evaluate their comparative merits;
- Include reasonable alternatives not within the jurisdiction of the lead agency; and
- Include the alternative of "No Action".

As shown on the draft Airport Layout Plan (ALP) (see **Figure 1.1-1** of **Chapter 1.0**, Purpose and Need), the City of Phoenix Aviation Department (City) has proposed an Airport Development Program (ADP) at Phoenix Sky Harbor International Airport (PHX). The purpose and need for the proposed Federal actions is to 1) meet the needs of the National Airspace System, 2) improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers (LFA, 2003), 3) maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time, and 4) improve access to the airport and efficiency of the on-airport roadway system. The proposed improvements would meet the objective of the City of Phoenix to accommodate forecast demand while balancing the capacity of airside and terminal facilities and continuing to provide an acceptable level of service to passengers and tenant airlines consistent with historical practice at PHX. It is important to note if PHX's improvements were to be built, the City, as the project Sponsor, would have the responsibility for planning, constructing, and operating the improvements at the airport.

The FAA's role is to: 1) ensure the safe and efficient use of navigable airspace in the U.S., 2) provide oversight for airport and airway trust fund for development of airport projects, 3) disclose and evaluate potential environmental impacts that may result from the proposed project and reasonable alternatives, and 4) evaluate the ability of the proposed project and reasonable alternatives to provide efficient and effective airport operations. The FAA has selected a "Preferred Alternative" based on the analysis documented in this FEIS. The identification of the environmentally preferred alternative will be documented in a Record of Decision to be developed by the FAA.

2.2 ALTERNATIVES EVALUATION AND SCREENING PROCESS

The FAA completed a thorough and objective review of reasonable alternatives to the City's proposed project at PHX in accordance with CEQ regulations, Section 1502.14. In consideration of the CEQ regulations, the FAA rejected alternatives if they showed no possibility of meeting the project purpose and/or need, as described previously, or offered no prospect of being built.

In **Chapter 1.0**, Purpose and Need of this FEIS, the FAA documented the purpose of and the need for the City's ADP and associated projects at PHX. This facilitated the identification of the range of reasonable alternatives to the proposed project. The analysis described below identified those alternatives, which might reasonably be expected to meet the proposed project's purpose and need. Those alternatives that did not reasonably meet the proposed project's purpose and need were not considered further in this screening process. Pursuant to CEQ regulations, Section 1502.16 and FAA Order 5050.4A, potential environmental impacts were also considered as part of the alternatives evaluation process. They are presented in **Chapter 4.0**, Environmental Consequences, of this FEIS. A No-Action Alternative was also carried forward throughout the detailed environmental analysis for baseline comparative purposes to fulfill CEQ requirements and disclose potential impacts if the project(s) were not developed.

In the development of this FEIS, the FAA identified a total of eight on-airport and off-airport alternatives. Off-airport alternatives identified included:

- Development of a new airport, and
- Use of other existing airports within the City of Phoenix/Maricopa County Area.

On-airport alternatives identified included:

- No-Action,
- City's proposed project,
- Modification and/or expansion of the existing terminal facilities, and
- Development of terminal facilities at an alternative site on the airport (3 sites evaluated).

The use of other modes of transportation was identified early in the evaluation process but was not retained for further consideration. Other modes of transportation would include the use of inter-city bus, roadways, conventional rail, and/or high-speed rail as alternatives to the proposed project. The FAA determined alternative modes of transportation would not provide a reasonable "fit" with the objectives of the proposed project. Those objectives relate to airport improvements to balance airfield and terminal capacity, replacement of outdated facilities and replacement of lost capacity, and operational efficiency enhancement measures to accommodate both existing and future levels of passenger activity at PHX. **Table 2.2-1** provides a summary of the on-airport and off-airport alternatives considered for evaluation by the FAA.

TABLE 2.2-1
SUMMARY DESCRIPTION OF OFF-AIRPORT AND ON-AIRPORT ALTERNATIVES CONSIDERED FOR EVALUATION

Alternative Location	Alternative Type	Description
Off-Airport Alternatives	Alternative 1 Construct New Airport	This alternative consists of developing a new air carrier airport at a new site. A new site would be property that is undeveloped and could be considered as a site for expanding urban development. A new site would require substantial financial investment and time to provide the infrastructure required to support the level of aviation activity at PHX. Opportunities for the development of a new airport would need to consider issues such as airspace availability, compatibility with existing facilities, availability of a willing owner/sponsor, and availability of suitable land within the primary airport service area.
	Alternative 2 Use of Existing Airports	The FAA evaluated the use of other airports to accept some of the air carrier operations at PHX. A summary of the pertinent characteristics and statistics of each airport is provided in **Table 2.3-1**. The locations of the existing airports evaluated as part of this alternative are shown in **Figure 2.3.1-1**.
On-Airport Alternatives	Alternative 4 South Airport Site	The triangular-shaped land area located on the south side of the airport was evaluated as a possible site for terminal development as an alternative to the proposed West Terminal. This site is bounded by I-10 to the southwest, Taxiway H to the north, and the Salt River to the southeast (see **Figure 2.3.2-2**). This site is approximately 185 acres in size and contains a variety of aviation-related facilities, including the Arizona Air National Guard, Office of Forestry, General Aviation Facilities, and the Air Cargo Complex. Roadway access to the South Airfield Site would be via South 24th Street and East Old Tower Road. FAA provided funding during the 1990s for airfield development in support of the replacement of Air National Guard facilities.
	Alternative 5 West Airport Site	Alternative 5 would involve the construction of a passenger terminal complex on the west side of the airport. This site would be located on airport-owned land situated west of I-10 and bounded by I-17 (Maricopa Freeway) to the south, 16th Street to the west, and Buckeye Road to the north (see **Figure 2.3.2-2**). The West Airport Site contains approximately 186 acres of airport property. The new PHX Rental Car Center (RCC) is being developed immediately to the south of the site. The remainder of the West Airport Site is primarily vacant with a few commercial businesses.

TABLE 2.2-1 (CONTINUED)
SUMMARY DESCRIPTION OF OFF-AIRPORT AND ON-AIRPORT ALTERNATIVES CONSIDERED FOR EVALUATION

Alternative Location	Alternative Type	Description
On-Airport Alternatives (Continued)	Alternative 6 Airport Development Program	This alternative is the Sponsor's proposed project. This alternative, as described in Section 1.1.1, would replace the existing Terminal 2 and provide for the construction of a new West Terminal and associated improvements at PHX. The proposed West Terminal would be constructed west of Terminal 3 on the existing Terminal 2 site (see Figure 2.3.2-3). This site is located in the central core of the airport along Sky Harbor Boulevard, between Runway 8/26 and Runway 7L/25R. The ADP Alternative consists of the following projects: demolition of Terminal 2; development of the West Terminal and associated aprons and taxilanes; relocation of all international operations (except America West) to the West Terminal; development of new crossfield Taxiways "U" and "V"; realignment of Sky Harbor Boulevard; and development of Stage 2 of the Automated People Mover System (APM).
	Alternative 7 Expansion of Existing Facilities	The City has developed a conceptual plan for expanding Terminal 3 as an alternative to development of the West Terminal (Ricondo, 2003). Terminal 3 would be expanded to the extent reasonable to accommodate the domestic airline operations currently located in Terminal 2. Terminal 2 would be demolished to allow for construction of the proposed realignment of Sky Harbor Boulevard. A conceptual layout for an expanded Terminal 3 facility is presented in Figure 2.3.2-5. The Terminal 3 alternative would increase the number of contact gates from 16 to 29 and add 20 remote aircraft parking positions.
	Alternative 8 North Airport Site	This alternative would involve the construction of a passenger terminal complex on a site located north of Runway 8/26 (see Figure 2.3.2-2). This site is bounded by East Washington Street to the north, 24th Street to the west, and Hohokam Parkway (State Road 143) to the east. This area has been identified by the City as a future acquisition area designated for airport use. The North Airfield Site contains approximately 218 acres of land, approximately 100 acres of which is owned by the airport. Land use at this site is dominated by a mix of industrial and commercial properties. Residential properties are scattered throughout the area and are currently a part of the voluntary acquisition program.
No-Action Alternative	Alternative 3	The No-Action Alternative assumes the proposed West Terminal Complex and associated improvements would not be developed. Terminals 2, 3, and 4 would continue to serve as the passenger processing facilities at PHX. Crossfield taxiways "U" and "V" and Stage 2 of the APM would not be constructed. Sky Harbor Boulevard would not be realigned or improved.

Source: URS, 2004.

The alternatives evaluation used a three-level evaluation and screening process. The Level 1 evaluation was performed to determine which alternatives met the purpose and need criteria for the proposed project as described in **Chapter 1.0**, Purpose and Need. The Level 2 evaluation was performed to determine if an alternative could effectively and efficiently accommodate terminal facilities having sufficient capacity to meet forecast demand. The Level 3 evaluation considered constructability and environmental considerations associated with the alternatives. Each of the Level 1, 2, and 3 evaluation criteria are discussed in detail below. Those alternatives that did not satisfy the evaluation criteria, or had substantial impacts, were eliminated from further consideration. At the conclusion of the Level 3 evaluation and screening, those alternatives remaining were subject to detailed analysis in **Chapter 4.0**, Environmental Consequences, of this FEIS.

2.2.1 LEVEL 1 ANALYSIS: PURPOSE AND NEED CRITERIA

The FAA is charged with following the congressional policy declaration [49 USC 47101(a)(7)] in which airport construction and improvement projects which increase the capacity of facilities to accommodate passenger traffic should be undertaken to the maximum possible extent, so safety and efficiency would increase and delays would decrease. Meeting operational site needs requires the careful integration of airside, landside, and surface transportation facilities.

In accordance with the Airport Act of 1982 and FAA Order 1050.1E, the FAA is required to evaluate all alternatives that are "reasonable, and achieve the project's purpose" to a proposed project. Purpose and need criteria include actions needed for PHX to meet passenger demand and improve the operational efficiency of the airport. Alternatives that did not meet the purpose and need criteria for the project were not considered further. Purpose and need evaluation criteria are described in the following paragraphs.

TO IMPROVE THE EFFICIENCY OF LANDSIDE PASSENGER HANDLING FACILITIES AT PHX TO ACCOMMODATE FORECAST DEMAND AND MAINTAIN AN ACCEPTABLE LEVEL OF SERVICE TO PASSENGERS

Alternatives were first evaluated for their potential to accommodate future demand while continuing to maintain an acceptable level of service to passengers. Studies performed by the City of Phoenix Aviation Department have documented the future need for additional terminal and gate facilities to accommodate the projected growth in passenger enplanements, promote competition between air carriers, maintain a level of service to all passengers consistent with historical standards, and provide space for new entrant air carriers.

In addition to accommodating forecast demand, an alternative must provide a level of service consistent with that established by the City of Phoenix Aviation Department. In planning facilities for PHX, Terminal 4 is representative of expectations established by the City of Phoenix Aviation Department for future terminal facilities. Facilities in this terminal are consistent with, and in some cases exceed, level of service standards referenced in the International Air Transportation Association (IATA), *Airport Development Reference Manual, 8th Edition* and the FAA AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*. In establishing their level of service guidelines, the City of Phoenix Aviation Department has determined the common departure lounge/holdroom concept and use of remote gate/aircraft hardstanding operations do not provide an acceptable level of service for passengers consistent with historical standards.

The FAA has determined that accommodating forecast demand and improving the efficiency of landside facilities would allow PHX to continue to serve the traveling public and contribute to the national air transportation network as one of the nation's busiest airports. Therefore, in the Level 1 screening analysis, only those alternatives that would enable the airport to accommodate future passenger demand would be considered for further analysis. Alternatives were eliminated from further consideration if they did not provide sufficient capacity to meet projected need at the desired level of service for airline passengers and tenant airlines.

MAINTAIN THE SAFETY AND IMPROVE THE EFFICIENCY OF AIRCRAFT GROUND MOVEMENTS

The air transportation industry relies on the ability to arrive and depart an airport facility without unnecessary service interruptions. As detailed in **Chapter 1.0**, Purpose and Need, ground delays associated with aircraft taxiing and queuing could lead to significant adverse operational and economic consequences. As the number of aircraft operations increase at PHX, ground delays and congestion on taxiways and apron areas could impact the safety of aircraft operations. In addition, increased taxiing and queuing times would require aircraft to operate on the ground for longer periods of time, increasing the total amount of exhaust emissions for each arrival and departure. An increase in exhaust emissions could impact air quality within the airport and surrounding environment. Therefore, in the Level 1 screening analysis, only those alternatives that maintain the safety of aircraft ground movements and improve the efficiency of airfield operations by reducing aircraft operating times were considered for further analysis.

IMPROVE ACCESS TO THE AIRPORT AND EFFICIENCY OF THE ON-AIRPORT ROADWAY SYSTEM

The availability of an efficient ground transportation system to effectively transport passengers into and out of the airport is critical to the operation of the airport and directly impacts the level of service provided to the traveling public. As previously discussed in **Section 1.2.3**, Surface Transportation Projects, vehicular traffic on surface roadways providing access to PHX is forecast to increase throughout the 2015 EIS study period. Roadway congestion and delays at four of the seven intersections along Sky Harbor Boulevard would operate at a level of service rating of "D" or "F" in 2015 (HDR, June 2003). The inefficiency of the roadway system servicing PHX would have a negative impact on airport operations and passengers. Therefore, in the Level 1 screening analysis, only those alternatives that improve traffic flow and reduce congestion on airport roadways were retained for further consideration in the Level 2 analysis.

2.2.2 LEVEL 2 EVALUATION: SITE ACCEPTABILITY CRITERIA

The FAA performed a Site Review as the Level 2 screening process for this FEIS to determine if other areas adjacent to the airport could effectively and efficiently accommodate terminal facilities having sufficient capacity to meet the projected future demand.

According to FAA's Advisory Circular (AC) 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities,* there are several fundamental considerations that affect terminal site selection. These considerations are discussed in the following paragraphs.

RUNWAY CONFIGURATION AND LAYOUT

The runway configuration at an airport has a significant impact on the optimal location of a passenger terminal complex. The terminal site should be located to minimize aircraft taxiing distances/times and the number of active runway crossings. The runway configuration may also restrict ground access to certain areas of the airport and thus limit alternative terminal sites. The Site Review criteria considered locations that had the potential to be reasonable and compatible with the existing airfield system.

ABILITY TO MEET AIRCRAFT FLEET MIX REQUIREMENTS

Terminal facilities require a location and configuration that would effectively accommodate the projected future fleet mix of aircraft at an airport. This includes a design that would ensure adequate distances from present and future aircraft operational areas in order to satisfy FAA airport geometric design standards. These standards include such minimum separation distances as: 1) those between a runway centerline and aircraft parking aprons, buildings, and airport property lines; and 2) those between a taxiway centerline, fixed/movable objects, and other taxiways. As part of this alternatives evaluation, the FAA reviewed alternatives with respect to their ability to fully comply with design standards applicable to PHX current and projected needs.

INTERSTATE AND REGIONAL SURFACE ACCESS

The passenger terminal should be located, when possible, to provide efficient routing to the transportation systems serving the population center generating the major source of passengers. Adequate area and distance should be provided between the transportation access network and the terminal building to accommodate the ultimate terminal development and necessary future ground access systems and improvements. Because of the importance of surface transportation system access, the Site Review considered locations that could provide connectivity with existing roadway systems.

In addition to the planning considerations contained in the FAA AC, the FAA also included two additional considerations in the Level 2 analysis as described below:

PROXIMITY TO AIRFIELD AND RUNWAY ENDS

The passenger terminal facility and its supporting infrastructure should be developed at a location that provides passenger terminal users with the most direct access to the airfield environment. Passenger terminal aprons, apron-edge taxilanes, and taxiways should be developed in a manner that provides the greatest compliment and efficient movement of air carrier aircraft. Taxi routes to and from each runway end should be developed to provide the most direct taxi path for arriving and departing aircraft operations.

The siting of new terminal facilities and the development of supporting infrastructures should include the avoidance of land areas and airspace located immediately beyond the approach and departure end of each runway. These land and airspace areas are reserved and maintained to facilitate the protection of navigable airspace for arrival and departure operations and to provide adequate safety setbacks beyond each runway end.

REASONABLENESS

Alternative site locations were evaluated for their reasonableness with respect to siting criteria which include operational, safety, policy, social, and economic consequences. For an alternative to be reasonable, it must be both "feasible" and "prudent". An alternative may be feasible if, as a matter of operational (modifications to the ground control system or increased aircraft taxi delay), safety (additional aircraft crossing active runways), policy (acquisition of off-airport property), social (decrease in passenger level of service), or economic (extensive cost to build) consequences. Alternatives that did not meet the reasonableness criteria for the project were not considered further.

2.2.3 LEVEL 3 EVALUATION CRITERIA: CONSTRUCTABILITY AND ENVIRONMENTAL CONSIDERATIONS

The Level 3 analysis examined the constructability and environmental considerations for the alternatives carried forward from the Level 2 evaluation. Constructability issues included factors such as necessity to relocate on-airport facilities, roadway closures or realignments, and disruption of airport operations. Environmental considerations include resource categories having measurable impact to threshold criteria as defined in FAA Order 5050.4A, *Airport Environmental Handbook*, and FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*. A summary of the Level 3 screening criteria is presented below. Detailed results of the Level 3 screening process are contained in Section 2.3.

Those alternatives remaining after the Level 3 evaluation were considered in detail in Chapter 4.0, Environmental Consequences, of this FEIS.

INFRASTRUCTURE

The effects of each of the alternatives on existing infrastructure were evaluated. This involved a quantification of impacts to existing infrastructure, including roadways and rail lines. This evaluation criterion was used because impacts to infrastructure can affect both airside and landside operations; the complexity of staging, phasing, and construction activities; the coordination and integration of the proposed project with other ongoing development projects; the safety of the general public; and the ability to obtain all the required Federal, state, and local permits. Each alternative was given a rating of "high," "moderate," or "low" with respect to the magnitude of the anticipated effects on existing infrastructure when compared to the other alternatives. Therefore, in the Level 3 screening analysis, those alternatives that resulted in greater impacts to existing and planned infrastructure were considered to be less reasonable than those resulting in fewer infrastructure impacts.

LAND ACQUISITION

The effects of each of the alternatives in terms of the number and type of properties that would have to be acquired were evaluated in the Level 3 screening process. This consisted of the quantification of the amount and type (residential, commercial, manufacturing, etc.) of property to be acquired in order to construct the proposed airside and landside facilities associated with a particular alternative. Similar to the infrastructure screening discussed previously, the property acquisition required for an alternative can present multiple effects on the implementation of a proposed project. For example, the acquisition of

commercial and manufacturing properties generally result in less social impacts than occur with the acquisition of residential properties, but it is usually more complex (more expensive than residential property acquisition and taking extended periods of time for coordination and completion). Therefore, in the Level 3 screening analysis, a comparison was made of the anticipated property acquisitions associated with each alternative. Those alternatives that resulted in no acquisition or lesser acreage of residential and commercial/manufacturing property acquisition were considered to be more feasible and prudent than those alternatives that required extensive property acquisition. Due to the increased difficulty in relocating commercial/manufacturing properties, they were considered to be less reasonable for development than residential properties.

RELOCATIONS

The effects of each of the alternatives in terms of the number and type of expected relocations were evaluated during the Level 3 screening process. This consisted of quantification of the number and type (residential, commercial, manufacturing, etc.) of properties that would have to be relocated to allow the construction of the proposed airside and landside facilities associated with a particular alternative. Similar to the infrastructure and acquisition issues discussed previously, the amount and type of facility relocations required for an alternative can have multiple effects (social impacts, increased cost, extended timeframes) on the implementation of the proposed project. In the Level 3 screening analysis, a comparison was made of the number and type of relocations associated with each alternative. Those alternatives that resulted in no relocations or lower relocation requirements were considered to be more reasonable and prudent than those with extensive relocation requirements.

MAINTENANCE OF AIRPORT OPERATIONS

This evaluation was based on a determination of whether or not the alternative would allow airport operations to continue uninterrupted during construction. FAA AC 150/5370-2C, *Operational Safety on Airports During Construction*, sets forth guidelines for airport operators to assist them in complying with 14 CFR Part 139 requirements of Federally funded construction projects. The AC states construction equipment should not normally penetrate an active runway's approach surface; construction equipment should not normally be permitted within 200 feet of an active runway centerline; and construction activity should not normally take place within a distance of 25 feet plus one-half the wingspan of the largest predominant aircraft from the centerline of an active taxiway or apron. Because of the importance of safety issues in airport operations, the maintenance of airport operations was evaluated in these screening criteria.

WETLANDS

Executive Order 11990 requires Federal agencies avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands, and direct or indirect support of new construction in wetlands wherever there is a practicable alternative. Impacts should only be allowed if there were no practicable alternative to the proposed project and if the proposed project were to include all practicable measures to avoid or minimize harm to wetlands. In keeping with the direction provided in this Executive Order, as well as provided in DOT Order 5660.1A, Section 10 of the *Rivers and*

Harbors Act of 1899 and Sections 401 and 404 of the *Clean Water Act*, the FAA evaluated each of the remaining alternatives in the Level 3 screening based on projected impacts to wetlands. Those alternatives that would result in no impacts or less impacts to wetlands were considered to be more reasonable alternatives than those that would result in a greater amount of impact(s).

FLOODPLAINS

Executive Order 11988 and DOT Order 5650.2 establish policies for the FAA to avoid, where practicable, taking an action within a 100-year floodplain. Every effort must be made to minimize the potential risks to human safety and property and also the adverse impacts on natural and beneficial floodplain values. The FAA evaluated each of the remaining alternatives in the Level 3 screening based on the approximate acreage of 100-year floodplains that would be impacted. Those alternatives that would result in no impacts or less impacts to floodplains were considered to be more reasonable than those that would result in a greater amount of impact(s).

SECTION 4(f) RESOURCES

The *Department of Transportation Act of 1966*, Section 4(f), since recodified at 49 USC, Section 303(c), provides "...the Secretary [of the DOT] may approve a transportation program or project...requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if (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 and waterfowl refuge, or historic site resulting from the use." In keeping with this direction concerning Section 4(f) resources, the FAA evaluated each of the remaining alternatives in the Level 3 screening based on their potential to result in direct or indirect impacts to properties protected under Section 4(f). Those alternatives that would result in no impacts or less impacts to Section 4(f) resources were considered to be more reasonable and prudent that those alternatives that would result in a greater amount of impact(s).

HISTORIC/ARCHITECTURAL, AND ARCHAEOLOGICAL RESOURCES

Historic, architectural, and archaeological resources are protected under several Federal laws. The most applicable to the proposed project are the *National Historic Preservation Act of 1966* and the *Archaeological and Historic Preservation Act of 1974.* Both of these laws require agencies implementing Federal actions take into consideration the historic and archaeological resources included in, or eligible for inclusion in, the National Register of Historic Places. In keeping with the direction provided in these laws, the FAA evaluated each of the remaining alternatives in the Level 3 screening based on the potential to result in direct or indirect impacts to such historic and/or archaeological resources. Those alternatives that would result in no (or less) impacts to these resources were considered to be more reasonable than those alternatives that would result in a greater amount of impact(s).

HAZARDOUS MATERIALS

Hazardous materials (including hazardous wastes, environmental contamination, and other regulated substances such as fuel) are included among the environmental assessment categories identified in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*. Because the disruption of sites containing hazardous materials or environmental contamination can have an impact on soils, surface water, groundwater, and air quality, the FAA evaluated each of the remaining alternatives in the Level 3 screening based on the potential to result in impacts to hazardous materials. Those alternatives resulting in no impacts or less impacts to hazardous materials were considered to be more reasonable than those alternatives resulting in a greater amount of impact(s).

Alternatives retained through the Level 3 screening process were considered to be the most reasonable alternatives to the proposed project and were retained by the FAA for further detailed environmental evaluation (see Chapter 4.0, Environmental Consequences, of this FEIS).

2.3 ALTERNATIVES CONSIDERED

The FAA examined reasonable off-airport and on-airport alternatives to the City's proposed project (Table 2.2-1). These alternatives are described below.

2.3.1 OFF-SITE ALTERNATIVES

2.3.1.1 New Airport (Alternative 1)

The FAA considered development of a new air carrier airport at a new site as an alternative to the proposed project at PHX. A new site would be property that is undeveloped and could be considered as a site for expanding and future urban development. A new site would require substantial financial investment and time to provide the infrastructure required to support the aviation activity at PHX. The major factors considered in evaluating a new airport site include operational authority to move aircraft operations, the development cost of the new facility, development cost of new infrastructure, access to highways and mass transit facilities, availability of a sponsoring organization (such as a local government or airport authority), community acceptance, financial feasibility, potentially significant environmental impacts, potential airspace conflicts, and the willingness of the air carrier operators to locate there. During the early 1990s, consideration had been given to the development of a new air carrier airport to be located between the cities of Phoenix and Tucson, Arizona. At this time, however, there are no plans on record for the development of new commercial aviation facilities in the Phoenix/Maricopa County area.

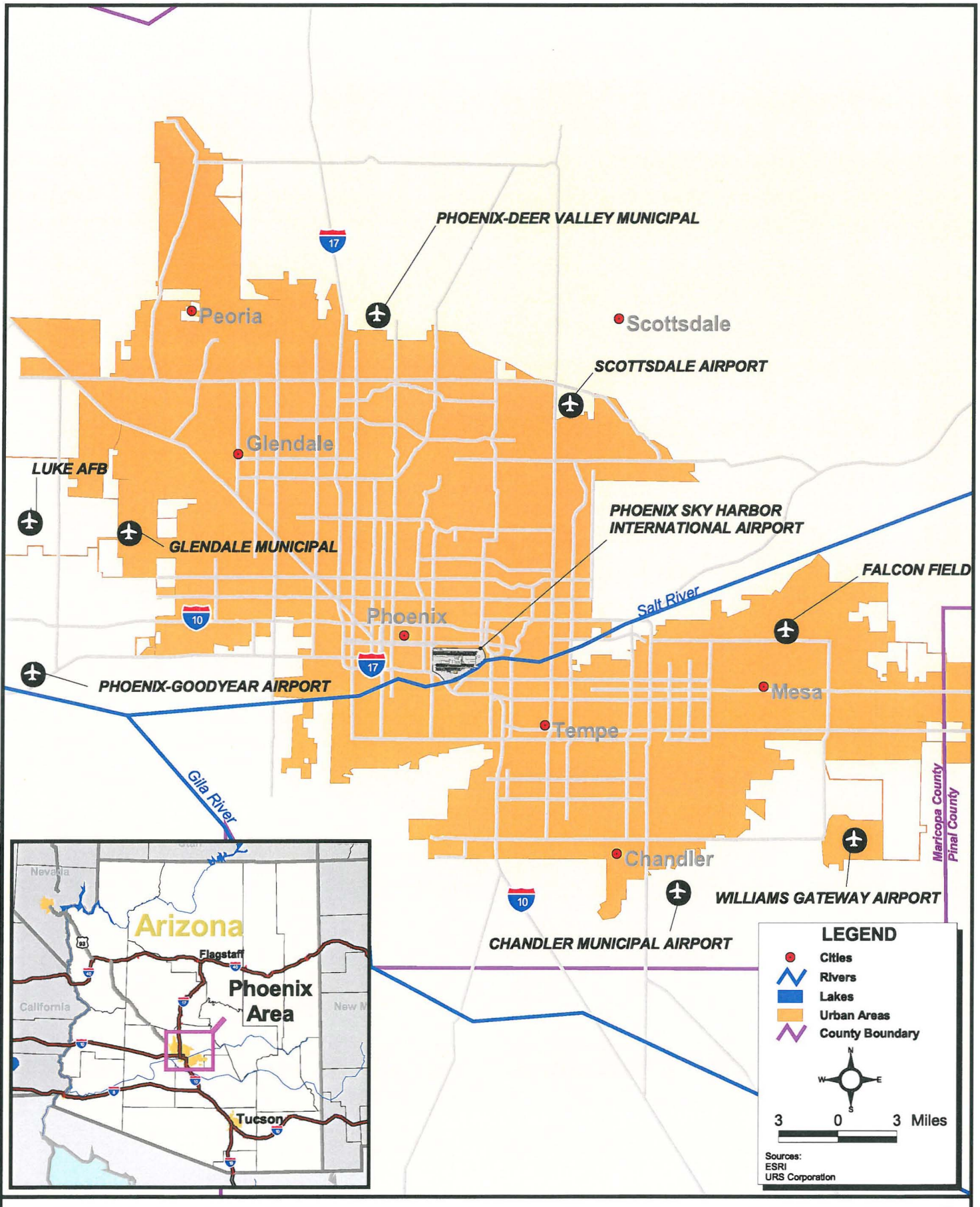
2.3.1.2 Use of Existing Airports (Alternative 2)

The FAA considered the use of other airports within the greater Phoenix area to accept some of the air carrier operations at PHX thereby reducing facility demand and improving the efficiency of passenger processing functions. The following discussion provides a brief description of these airports. Their locations are depicted in Figure 2.3.1-1. A summary of the pertinent characteristics and statistical data for each airport are provided in Table 2.3-1.

TABLE 2.3-1
CHARACTERISTICS OF OTHER AIRPORTS IN THE VICINITY OF PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

Airport Characteristics	Phoenix Deer Valley	Falcon Field	Phoenix-Goodyear	Scottsdale	Williams Gateway	Chandler Municipal	Glendale Municipal	Luke AFB
Location	Phoenix	Mesa	Goodyear	Scottsdale	Mesa	Chandler	Glendale	Glendale
Owner/Operator	City of Phoenix Aviation Department	City of Mesa	City of Phoenix Aviation Department	City of Scottsdale	Williams Gateway Airport Authority	City of Chandler	City of Glendale	U.S. Air Force
FAA NPIAS Designation[4]	Reliever	Reliever	Reliever	Reliever	Reliever	Reliever	Reliever	Private
Approximate Distance and Direction from Phoenix CBD	16 miles North	19 miles East	17 miles West	15 miles Northeast	24 miles Southeast	19 miles Southeast	14 miles West-Northwest	18 miles West-Northwest
Number of Runways	2	2	1	I	3[3]	2	1	2
Runway Configuration	Parallel	Parallel	Single	Single	Parallel	Parallel	Single	Parallel
Part 139 Compliance	No	No	No	No	Class II	No	No	n/a
Primary Runway: - Designation - Length (ft) - Width (ft) - Material	 7R/25L 8,208 100 Asphalt	 4R/22L 5,102 100 Asphalt	 3/21 8,500 150 Asphalt	 3/21 8,249 100 Asphalt	 12R/30L 10,401 150 Concrete	 4R/22L 4,850 75 Asphalt	 01/19 7,150 100 Asphalt	 3L/21R 10,012 150 Asphalt
Secondary Runway: - Designation - Length (ft) - Width (ft) - Material	 7L/25R 4,500 75 Asphalt	 4L/22R 3,801 75 Asphalt	 ---	 ---	 12C/30C 10,201 150 Concrete/Asphalt	 4L/22R 4,401 75 Asphalt	 ---	 3R/21L 9,904 150 Asphalt
Runway Edge Lighting	Medium Intensity	Medium Intensity	Medium Intensity	Medium Intensity	High Intensity	Medium Intensity	Medium Intensity	High Intensity
Precision-Approach Path Indicators (PAPI)	2-Light	2-Light	No (2-Box VASI)	2-Light	4-Light	4-light (4R/22L) 2-Light VASI (4L/22R)	2-Light	4-Light
Capability - Based Aircraft[1] - Annual Operations[2]	 923 389,309	 947 281,742	 198 132,681	 439 194,472	 53 182,009	 301 219,671	 269 88,449	 n/a 100,000

n/a - not applicable.
Sources:
[1] FAA Form 5010-1, Airport Master Record, August 5, 2004.
[2] Air Traffic Activity Data System (ATADS), AirNav.com, online, 2004.
[3] Williams Gateway Airport has three parallel runways ranging from 9,301 to 10,401 feet in length.
[4] National Plan of Integrated Airport Systems, FAA 2005.



Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Other Existing Airports

FIGURE
2.3.1-1

c1 516//g:\c1 375-GIS Data 2\IG:\Phoenix els\Applications\aprt\phx els.apr(Figure 2.3.2-1 Other Existing Airports), LAV, 09/21/04

Phoenix Deer Valley Airport (Reliever) - Phoenix Deer Valley Airport (DVT) is located in Maricopa County, Arizona, approximately 16 miles north of the Phoenix Central Business District (CBD). This reliever airport is situated on approximately 674 acres of land, and it is owned by the City of Phoenix and operated by the Aviation Department. DVT has two runways in an east/west parallel configuration (Runway 7R/25L - 8,208 feet and Runway 7L/25R - 4,250 feet). The 2002 Terminal Area Forecast (TAF) lists DVT as having 923 based aircraft and 395,803 annual operations, with no recorded passenger enplanements for the year 2002. Phoenix Deer Valley Airport has air charter services including Western Air Express, Westwind Aviation, New Flight Charters, and RSVPair.

Falcon Field Airport (Reliever) - Falcon Field Airport (FFZ) is located in Maricopa County, Arizona, approximately 19 miles east of the Phoenix CBD. This reliever airport is owned and operated by the City of Mesa. FFZ has two runways in a northeast/southwest parallel configuration (Runway 4R/22L - 5,102 feet and Runway 4L/22R - 3,801 feet). The 2002 TAF lists FFZ as having 947 based aircraft and 272,089 annual operations, with no recorded passenger enplanements for 2002. Falcon Field has 5 air charter businesses including Airevac Services Inc., Air West Inc., Arizona Heliservices Inc., Falcon Executive Aviation, LTD., and Helicopter Systems.

Phoenix-Goodyear Airport (Reliever) - Phoenix Goodyear Airport (GYR) is located in Maricopa County, Arizona, approximately 17 miles west of the Phoenix CBD. This former U.S. Naval Air Facility and current reliever encompasses approximately 800 acres of land and has one northeast/southwest oriented runway. GYR is owned and operated by the City. Since the most recent Master Plan (1996) for GYR, there have been major improvements including a new terminal building, a new maintenance facility and additional aircraft tie-downs, T-hangars, and ramp space. Runway 3/21 has a total length of 8,500 feet. In 2002, GYR had 198 based aircraft, 138,372 operations, and a total of 17 passenger enplanements (FAA, 2002). OneSky and RSVPair provide air charter services at Phoenix-Goodyear Airport.

Scottsdale Airport (Reliever) - Scottsdale Airport (SDL) is located in Maricopa County, Arizona, approximately 15 miles northeast of the Phoenix CBD. This airport, with one northeast/southwest oriented runway (Runway 3/21 - 8,249 feet), is owned and operated by the City of Scottsdale and has been designated by the FAA as a "Reliever" airport. The 2002 TAF lists SDL as having 439 based aircraft and 189,391 annual operations. SDL is limited in acreage and has developed constraints. There were no passenger enplanements recorded for the year 2002. Scottsdale currently serves approximately 10,000 passengers annually on private charter flights. There are 11 aircraft charter services, operating at Scottsdale. These include Aero Jet Services, Corporate Jets, Great Western Air, Scottsdale Flyers, Grand Canyon Airlines, Pinnacle Air Charter, Sawyer Aircraft Charter, Sonoran Charters, Southwest Jet Aviation Center, West Jet Aircraft, and Westcor Aviation. In April 1978, the Scottsdale and Phoenix City Councils entered into a joint resolution to coordinate aeronautical services to area residents. The City Councils of these cities agreed that SDL would be permitted to provide charter service; however, PHX would be the only airport to provide service by air carriers using large jet aircraft such as Boeing 747s. The enactment of the Airline Deregulation Act of 1978 (ADA) superseded this local agreement.

Williams Gateway Airport (Commercial Service Reliever Airport) - Williams Gateway Airport (IWA) is located within the jurisdictional boundaries of the City of Mesa in Maricopa County, Arizona. It encompasses 3,019 acres of the former Williams Air Force Base (AFB) with three northwest/

southeast oriented runways (Runway 12R/30L - 10,401 feet, Runway 12C/30C - 10,201 feet, and Runway 12L/30R - 9,301 feet). It is located 24 miles southeast of the Phoenix CBD. IWA, a reliever airport, is governed by the Williams Gateway Airport Authority (WGAA), which consists of the City of Mesa, the towns of Gilbert and Queen Creek, and the Gila River Indian Community. The 2002 TAF lists IWA as having 53 based aircraft and 173,063 annual operations. Williams Gateway currently serves approximately 25,000 passengers annually on private charter flights. Allegiant Air currently serves over 2,000 passengers on charter flights to Reno and Laughlin. In 2006, Vision Air will begin service of four flights a week from Williams Gateway to North Las Vegas on a 30-seat turboprop aircraft. In year 2002, a total of 117 passenger enplanements were recorded.

Chandler Municipal Airport (Reliever) - Chandler Municipal Airport (CHD), a reliever airport, is located in Maricopa County, Arizona, approximately 19 miles southeast of the Phoenix CBD. CHD has two northeast/southwest oriented runways (Runway 4R/22L - 4,850 feet and Runway 4L/22R - 4,401 feet) and is owned and operated by the City of Chandler. The 2002 TAF lists CHD as having 301 based aircraft and 225,486 annual operations. Quantum Helicopters provides helicopter flight training and charter service at Chandler Municipal Airport. In year 2002, no passenger enplanements were recorded.

Luke Air Force Base (Private) - Luke Air Force Base (LUF) is located 18 miles west-northwest of the Phoenix CBD. LUF is a U.S. military airport with two parallel northeast/southwest oriented runways (Runway 3L/21R - 10,012 feet and Runway 3R/21L - 9,904 feet); however, they are not available for civilian use. LUF has served as an airfield for more than 50 years acting as the base for a wide range of aircraft from the AT-6 to the F-16. LUF has more than 200 based aircraft and 7,000 military and reserve and 1,500 civilian employees.

Glendale Municipal Airport (Reliever) - Glendale Municipal Airport (GEU), a reliever airport, is located in Maricopa County, approximately 14 miles west-northwest of the Phoenix CBD. GEU has one northeast/southwest oriented runway (Runway 01/19 - 7,150 feet) and is owned and operated by the City of Glendale. The 2002 TAF lists GEU as having 269 based aircraft and 111,382 annual operations. In 2002, no passenger enplanements were recorded. Air West Inc., RSVPair, and OneSKY provide charter services at Glendale Municipal Airport.

2.3.2 ON-SITE ALTERNATIVES CONSIDERED

2.3.2.1 No-Action Alternative (Alternative 3)

The No-Action Alternative assumes the proposed West Terminal Complex and associated improvements would not be developed. Terminals 2, 3, and 4 would continue to serve as the passenger processing facilities at PHX. Crossfield taxiways "U" and "V" and Stage 2 of the APM would not be constructed. Sky Harbor Boulevard would not be realigned or improved.

The City has developed conceptual reduced scale alternatives for evaluating the possible No-Action scenarios at PHX should proposed improvements not be constructed (see Appendix H of this FEIS). The No-Action Alternative would necessitate the development and use of remote gate positions to help accommodate the projected number of passenger enplanements. This would require the busing of

passengers between aircraft and passenger processing facilities. Busing operations could potentially subject passengers to temperatures above 100° F during much of the year when transferring between the terminal and aircraft. Figure 2.3.2-1 illustrates a conceptual remote gate configuration to accommodate future passenger demand under a No-Action Alternative. The No-Action Alternative would require the conversion of Terminal 2 to an airfield bus terminal to serve remote aircraft parking positions. This facility would have no contact gate positions and would be renovated internally to provide increased passenger processing.

Under the No-Action Alternative, Terminal 3 would continue to be operated. This facility would be upgraded and modified to accommodate the existing contact gate positions as well as remote aircraft parking positions for Airplane Design Group (ADG) IIIa and smaller aircraft. Under the No-Action Alternative, the interior of Terminal 3 would be upgraded (e.g., outbound baggage makeup renovated, security checkpoint expanded) to accommodate the existing contact gate positions as well as remote aircraft parking positions for ADG IIIa and smaller aircraft. Due to the typically longer periods at contact gates between arrival and departure, ADG IV and V aircraft would be towed off contact gate positions during peak periods, as possible, to accommodate additional aircraft. In addition, the facility would be operated as a common use facility without preferential gate assignments. It was assumed that the current airline tenant mix accommodated in Terminal 3 would remain.

Terminal 4 would accommodate international arrivals, as it currently does. Concourse S1 is planned to be constructed during the timeframe considered in the EIS and would be available to support airport operations.

Under the No-Action Alternative, the existing roadway system would serve the terminal complex. Stage 1 of the APM system would be operational; however, the APM would not connect to either the Rental Car Center (RCC) or the Valley Metro Light Rail Station.

2.3.2.2 South Airfield Site (Alternative 4)

The FAA examined areas on and adjacent to PHX that could accommodate development of terminal facilities and supporting infrastructure. The triangular-shaped land area located on the south side of the airport was evaluated as a possible site for terminal development as an alternative to the proposed West Terminal. This site is bounded by I-10 to the southwest, Taxiway H to the north, and the Salt River to the southeast (see Figure 2.3.2-2). This site is approximately 185 acres in size and contains a variety of aviation-related facilities, including the Arizona Air National Guard (ANG), Office of Forestry, General Aviation Facilities, and the Air Cargo Complex. Roadway access to the South Airfield Site is via South 24th Street and E. Old Tower Road.

The South Airfield Site Alternative would include demolition of Terminal 2, development of the dual crossfield taxiways "U" and "V," realignment of Sky Harbor Boulevard, and development of the Stage 2 APM. Terminal 2 would be demolished because it would be too costly to renovate and upgrade. As previously discussed in Section 1.2.1.1, many of the facilities in Terminal 2 would require replacement. Additionally, the presence of asbestos-containing materials in many areas of the building would significantly increase the cost of any renovation projects. Abandoning the building in place would limit

development opportunities through the central core of the airport and would limit the ability of the airport to meet future passenger and air carrier demand. Development of new crossfield taxiways would improve the efficiency of movements between Terminals 3 and 4, and the north and south runways. Additional roadway construction would be required to provide access to the site. Realignment of Sky Harbor Boulevard would improve access to the airport and the flow of traffic on airport roadways. The Stage 2 APM would be developed to provide a connection from Terminal 3 to the new terminal facility and to the RCC. Stage 2 APM development would also include a connection from the East Economy Parking Garage (EEPG) northward to the Valley Metro Light Rail Station (44th Street and Washington Street).

2.3.2.3 West Airfield Site (Alternative 5)

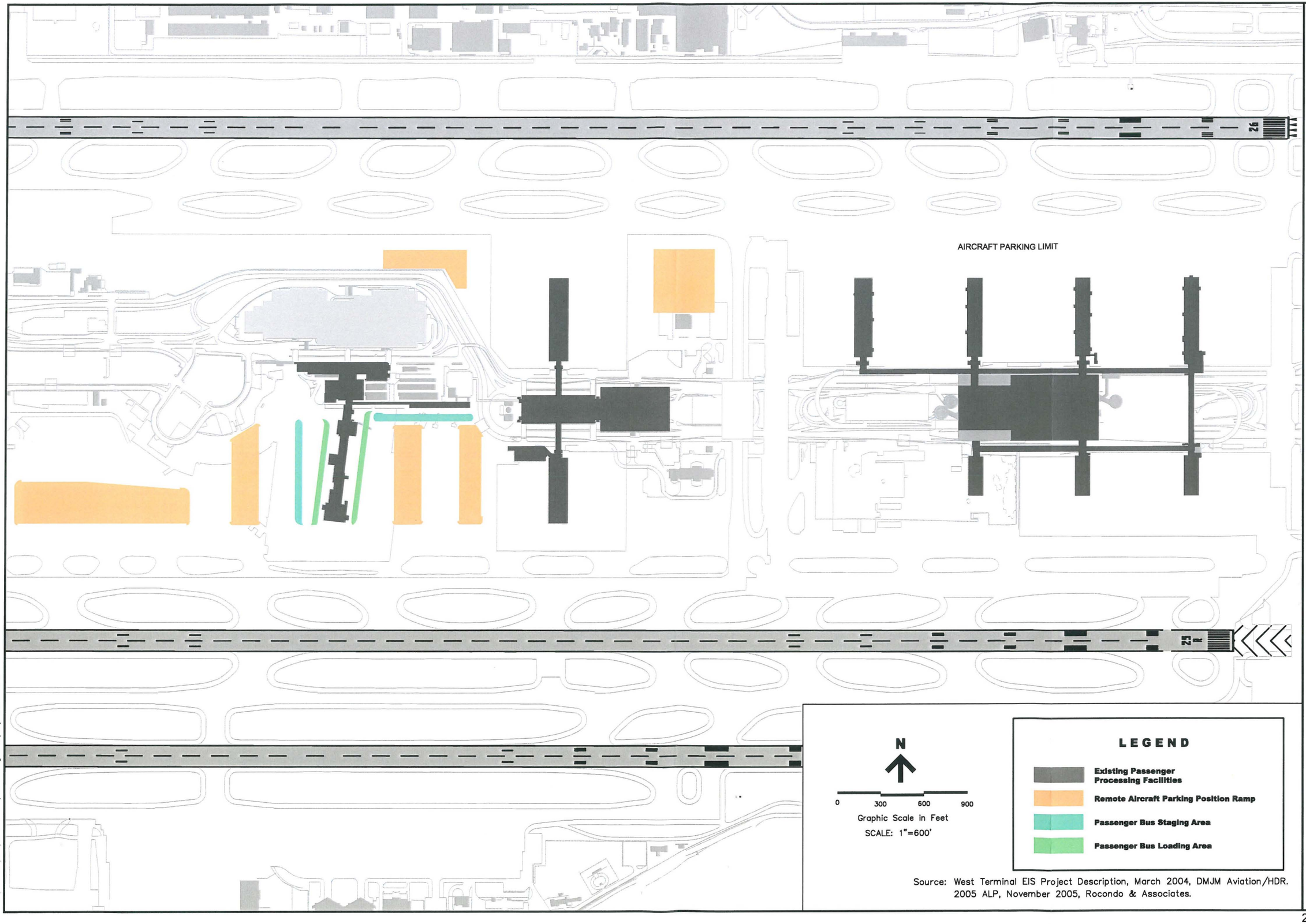
The West Airport Site would involve the construction of a passenger terminal complex on the west side of the airport. This site would be located on airport-owned land situated west of I-10 and bounded by I-17 (Maricopa Freeway) to the south, 16th Street to the west, and Buckeye Road to the north (see Figure 2.3.2-2). The West Airport Site contains approximately 186 acres of airport property. Property in the vicinity of the West Airport Site consists of primarily vacant land with a few commercial businesses. Access to this site includes East Sky Harbor Boulevard, East Buckeye Road, and South 16th Street. Development of terminal facilities at this site would also include demolition of Terminal 2, development of the dual crossfield taxiways "U" and "V," and realignment of Sky Harbor Boulevard. Terminal 2 would be demolished because it would be too costly to renovate and upgrade and abandoning the building in place would not be a prudent use of public property. The space currently occupied by the terminal is within the central core of the airport and could be used in the future to meet additional facility and/or operational needs. Realignment of Sky Harbor Boulevard would improve access to the airport and the flow of traffic on airport roadways. The Stage 2 APM would be developed to provide a connection from Terminal 3 to the new terminal facility and to the RCC. Stage 2 APM development would also include a connection from the EEPG northward to the Valley Metro Light Rail Station (44th Street and Washington Street).

2.3.2.4 Airport Development Program (Alternative 6)

The ADP is the Sponsor's proposed project. This alternative, as described in Section 1.1.1, would replace the existing Terminal 2 and provide for the construction of a new West Terminal and associated improvements at PHX. The proposed West Terminal would be constructed west of Terminal 3 on the existing Terminal 2 site (Figure 2.3.2-3). This site is located in the central core of the airport along Sky Harbor Boulevard, between Runway 8/26 and Runway 7L/25R.

The ADP Alternative consists of the following projects:

- Demolition of Terminal 2 and Ancillary Facilities,
- West Terminal Development (33-Gate Terminal), Garage and Terminal Roadways,
- Modifications to Terminal 4, Concourse N4 International Gates,
- Construction of Crossfield Taxiways Uniform "U" and Victor "V",
- Sky Harbor Boulevard Modifications, and
- Construction of Stage 2 of the Automated People Mover System (APM).



Source: West Terminal EIS Project Description, March 2004, DMJM Aviation/HDR. 2005 ALP, November 2005, Rocondo & Associates.

Phoenix Sky Harbor INTERNATIONAL AIRPORT

Environmental Impact Statement

No-Action Alternative

FIGURE 2.3.2-1

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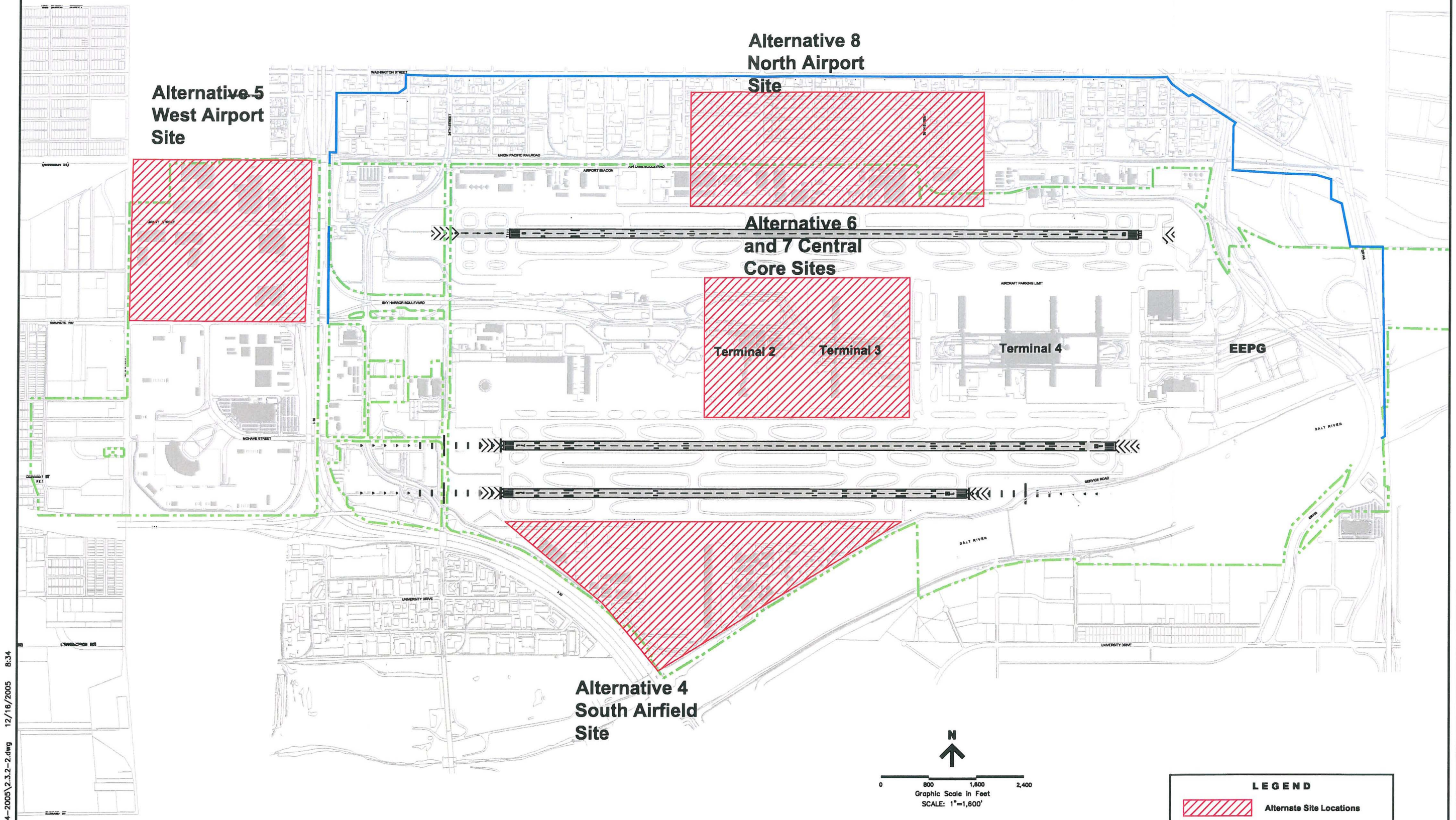

Source: West Terminal EIS Project Description, March 2004, DMJM Aviation/HDR.
ALP, City of Phoenix, Phoenix Sky Harbor International Airport.
URS Corporation, 2004.
2005 ALP, November 2005, Rocondo & Associates.

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
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Alternative Terminal Development Site Locations at Phoenix Sky Harbor International Airport

FIGURE
2.3.2-2

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Light-Rail Transit,
44th Street
Connector Station

WASHINGTON STREET
JEFFERSON STREET
34TH STREET
UNION PACIFIC RAILROAD
36TH STREET
AIRPORT BEACON
AIR LANE BOULEVARD
AIRCRAFT PARKING LIMIT
TAXIWAY V
TAXIWAY U
Terminal 3
Terminal 4
EEPG
SALT RIVER
SERVICE ROAD
UNIVERSITY DRIVE
Cargo
Air
National
Guard

N

0 700 1,400 2,100

Graphic Scale in Feet

SCALE: 1"=1,400'

LEGEND

- Terminal Area of Demolition and Construction
- West Terminal Complex
- Apron
- Crossfield Taxiways
- Future Parking Garage
- Terminal 2 Parking To Be Demolished
- APM Station Stage 2
- Future APM Maintenance Facility
- APM Stage 2
- Modification to Terminal 4, Concourse N4 International Gates
- Modification/ Realignment of Sky Harbor Blvd.

Source: West Terminal EIS Project Description, March 2004, DMJM Aviation/HDR.
2005 ALP, November 2005, Rocondo & Associates.

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Airport Development Program
Proposed Projects

FIGURE
2.3.2-3

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The West Terminal would be designed to accommodate operations for domestic airlines currently operating in Terminal 2, plus excess demand for domestic airlines currently operating in Terminal 3. In addition, all international airlines, except for America West's international service, would be located in the West Terminal. The ADP Alternative would address the Terminal Area Demand Capacity Analysis (DMJM Aviation/HDR, 2004) forecasts for PHX through the year 2015.

As currently planned, the proposed project would be a phased development process that would allow for construction of the West Terminal Complex, Stage 2 APM, crossfield taxiways, and Sky Harbor Boulevard modifications while minimizing impacts to airport operations and the flow of vehicular traffic into and out of the airport. The proposed construction schedule for the ADP Alternative is provided in **Figure 2.3.2-4**. Initial development of the West Terminal would consist of 18 gates. These gates would be used as replacement to the 14 gates lost through demolition of Terminal 2, and to alleviate the existing shortfall in gate capacity. The remaining 15 gates would be developed following realignment of Sky Harbor Boulevard. Development of the 15 gates would be required for PHX to efficiently meet the forecast demand for terminal facilities consistent with the FAA approved forecast for PHX. During the project planning process, the City gave consideration to constructing a West Terminal facility with a reduced capacity (fewer gates) to replace gates lost through the potential demolition of Terminal 2 and to address the potential near-term increase in passenger demand. Under this partial build scenario, the West Terminal Complex would be constructed and include only two concourses on the south side of the terminal. This would provide a total of 18 gates, or a net increase of 4 gates when compared to the existing condition. Additional concourses and gates could be constructed in the future to meet the projected 2015 facility demands. Under this scenario, Sky Harbor Boulevard and the West Terminal roadway system would be developed to service the 18-gate terminal facility and improve traffic flow through the airport.

Delaying construction of additional concourses and gates on the West Terminal until a later date would result in a prolonged period of disruption to both landside and airside facilities, and raise the total project cost as contractors would have to mobilize and demobilize for each construction interval. In addition, the cost for raw materials such as concrete and steel would likely increase between construction phases.

If deferred until a later date, construction of a north concourse on the West Terminal would be accomplished after modifications to Sky Harbor Boulevard were complete. The movement of construction equipment around and on this roadway could result in traffic delays and impact the flow of traffic into and out of the airport. The total amount of project-related air pollutant emissions resulting from the partial build scenario would be expected to be higher than the full build scenario. The increase in air emissions would result from the need to remove existing roadway surfaces developed to service the West Terminal, excavation and paving activities, and vehicle emissions resulting from the disruption of traffic flow, congestion, and delays associated with construction activities on an active roadway system.

Given the potential for a prolonged period of disruption to airport operations under a partial build scenario, the short period of time between completion of an 18-gate terminal and the need for additional gate capacity, and the adverse environmental consequences previously described, the City did not consider the construction of a smaller terminal, or one with fewer than 33 gates to be practical. Therefore, the potential of construction a West Terminal with less than the 33 gates required to meet the 2015 passenger demand was not considered further.

2.3.2.5 Expansion of Existing Facilities (Alternative 7)

As an alternative to development of the West Terminal, the City examined the potential to expand the existing facilities in Terminals 2, 3, and 4. As previously discussed in **Chapter 1.0**, Purpose and Need, opportunities to expand and extend the service life of Terminal 2 are limited due to the age and condition of the facility. In addition, opportunities to expand and extend the service life of Terminal 2 are limited by the presence of asbestos-containing materials, limited expansion space for tenant airlines, and need for modifications to address security requirements for baggage and passenger screening (DMJM Aviation/HDR, 2003).

The City has developed a conceptual alternative for evaluating the potential for expanding Terminal 3 as an alternative to development of the West Terminal (DMJM Aviation/HDR, 2003). Under this alternative, Terminal 3 would be expanded to the extent achievable to accommodate the domestic airline operations currently located in Terminal 2. Terminal 2 would be demolished to allow construction of the proposed realignment of Sky Harbor Boulevard.

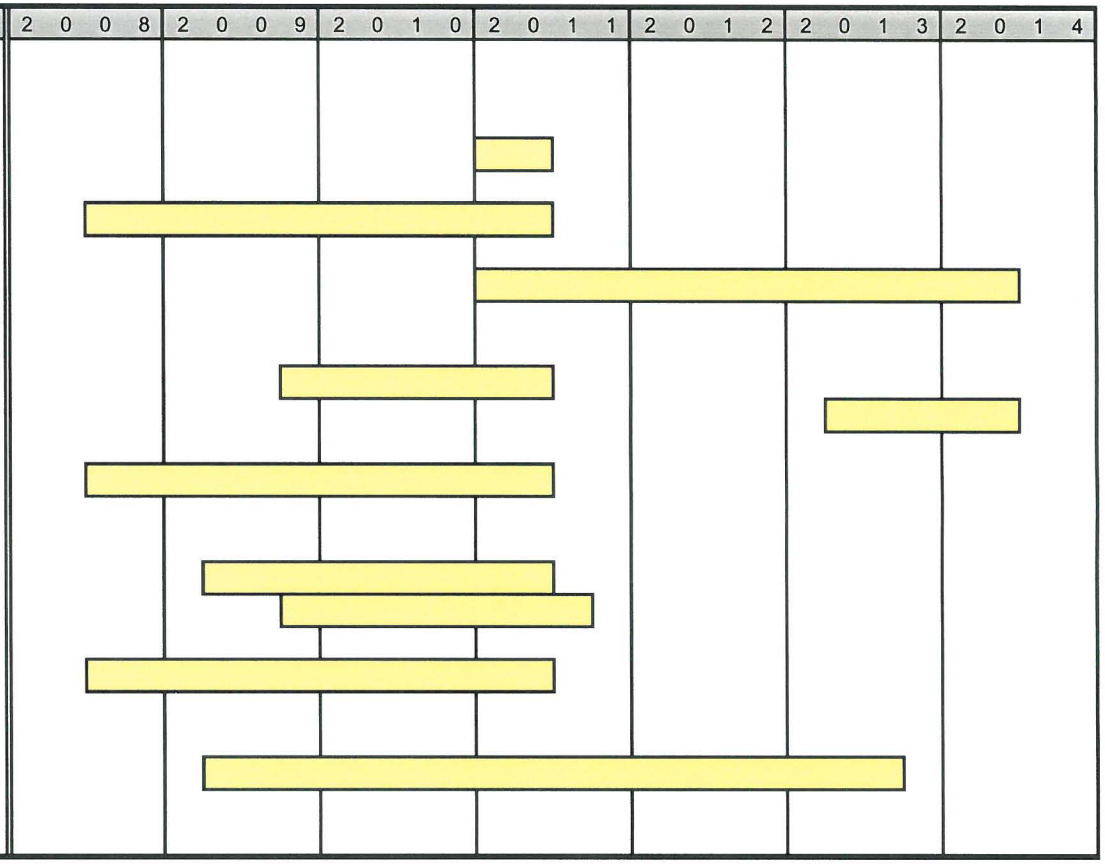
A conceptual layout for an expanded Terminal 3 facility is presented in **Figure 2.3.2-5**. The Terminal 3 alternative would consist of an expanded multi-level, linear main terminal with additional concourses. The Terminal 3 alternative would increase the number of contact gates in Terminal 3 from 16 to 29 and add 20 remote aircraft parking positions. Further expansion of Terminal 3 beyond the 29 gate facility was determined to be possible, but not reasonable with respect to facility design, and the requirement that additional terminal development be accomplished within the physical constraints of the existing terminal, taxiway, and surface transportation system. Due to terminal access roadway and proximity of apron constraints, further expansion in the central core of the airport would necessitate a linear terminal configuration with the primary passenger processing facilities located on a single street level. Given the extremely narrow terminal configuration and the requirement for adequate circulation and building egress, the passenger ticketing/check-in, and baggage claim areas would remain considerably below recommended industry standards. The single level roadway and the dual sided linear terminal configuration would require that curb frontage provide zones for departing and terminating passengers on both sides of the terminal. Expansion of Terminal 3 provides areas for the designated zones, but under a comparison of current and future demand, the available frontage would not be adequate to provide an acceptable level of service and would not efficiently meet the 2015 forecast demand.

Stage 2 of the APM system would be developed to connect with APM Stage 1, the RCC and the Valley Metro Light Rail Station (44th Street and Washington Street) (DMJM Aviation/HDR, 2003). Stage 1 of the APM is currently under construction and has been evaluated in a separate NEPA study (*Environmental Assessment for the Automated People Mover Stage 1*, DMJM Aviation/HDR, June 2004). The APM Stage 1 Environmental Assessment (EA) was issued a Finding of No Significant Impact (FONSI) by the FAA on August 6, 2004. Sky Harbor Boulevard would be realigned to improve access to PHX and relieve congestion on airport roadways. New dual crossfield taxiways would be developed to improve the efficiency of aircraft ground operations.

Terminal 4 is currently being expanded to include additional gates on new Concourses S1 and S2. These concourses are located on the southwest side of Terminal 4 and will provide an additional 16 contact gates. With the Alternative 7 scenario, all international operations would remain in Terminal 4. Some additional expansion of Terminal 4 would be possible in the future; however, physical constraints relating to the location of the terminal with respect to other existing facilities and operational requirements would prevent significant expansion of Terminal 4 to the capacity needed to meet the projected 2015 demand.

Figure 2.3.2-4
POTENTIAL ADP ALTERNATIVE CONSTRUCTION SCHEDULE

Project	Start Date	Finish Date
ADP Alternative		
Terminal 2 Demolition	Jan-11	Jun-11
West Terminal (18 Gates)	Jul-08	Jun-11
West Terminal (+15 Gates = 33 gates)	Jan-11	Jun-14
West Terminal Apron		
South	Oct-09	Jun-11
North	Mar-13	Jun-14
West Terminal Roadway	Jul-08	Jun-11
Crossfield Taxiways		
Taxiway "U"	Mar-09	Jul-11
Taxiway "V"	Oct-09	Sep-11
West Roadway	Jul-08	Jun-11
APM		
Stage 2	Mar-09	Sep-13



Source: City of Phoenix Aviation Department, 2005.

REMOTE AIRCRAFT HOLDROOM

NORTH CONCOURSE

NE CONCOURSE

APM STATION

ATC

TERMINAL 3 EXPANSION

TERMINAL 3

PARKING STRUCTURE

SW CONCOURSE

REMOTE AIRCRAFT HOLDROOM

SOUTH CONCOURSE

MALSR

N

0 300 600 900

Graphic Scale in Feet

SCALE: 1"=600'

LEGEND

- Existing Buildings
- Terminal 3 Expansion
- Existing Road
- Future Taxiway Pavement
- Remote Aircraft Parking Position Ramp
- APM Stage 2 Station
- APM Stage 2
- Terminal 2 Parking To Be Demolished
- Modification/ Realignment of Sky Harbor Blvd, as Part of Terminal 3 Expansion Alternative

Source: DMJM Aviation/HDR Planning Team, August, 2003
2005 ALP, November 2005, Rocondo & Associates.

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Phoenix Sky Harbor INTERNATIONAL AIRPORT

Environmental Impact Statement

Expansion of Existing Facilities

FIGURE 2.3.2-5

2.3.2.6 North Airport Site (Alternative 8)

The North Airport Site would involve the construction of a passenger terminal complex on a site located north of Runway 8/26 (see Figure 2.3.2-2). This site is bounded by East Washington Street to the north, 24th Street to the west, and Hohokam Parkway (SR 143) to the east. This area has been identified by the City as a future acquisition area to be designated for airport use and is currently in a voluntary acquisition program. The North Airport Site contains approximately 218 acres of land. Airfield access would be provided by relocating the Union Pacific Railroad right-of-way to Washington Street, potentially in conjunction with the proposed City of Phoenix light rail system. Land use at this site is dominated by a mix of industrial and commercial properties. Approximately 57 single-family homes and 12 duplex residential units are located within the North Terminal Site. There are currently a number of long-term lease holders on the North Airport Site that have made a substantial capital investment in developing facilities on this property. Relocation of these lease holders could have a negative economic impact on their businesses and the surrounding area.

The development of terminal facilities at the North Airport Site would also include demolition of Terminal 2, development of the dual crossfield taxiways "U" and "V," realignment of Sky Harbor Boulevard, and development of the Stage 2 APM. Although not required for the development of the new terminal, surface transportation and taxiway systems, Terminal 2 would be demolished because to leave it in place would not be a prudent use of public property. The space currently occupied by the terminal is within the central core of the airport and could be used in the future to meet additional facility and/or operational needs. The Stage 2 APM would be developed to provide a connection from Terminal 3 to the new terminal facility and to the RCC. Stage 2 APM development would also include a connection from the EEPG northward to the Valley Metro Light Rail Station (44th Street and Washington Street).

2.4 ALTERNATIVES EVALUATION

Each of the eight alternatives was subjected to the three-level alternatives screening process to determine which alternatives were reasonable and feasible to be retained for detailed evaluation in this FEIS. The following is a summary of the results of the screening process. Table 2.4-1 depicts how each alternative passed through the three-level alternatives screening process.

2.4.1 LEVEL 1 SCREENING

Level 1 of FAA's alternatives screening process evaluated each alternative scenario for the ability to fully satisfy all of the purpose and need criteria previously established in Chapter 1.0, Purpose and Need, of this FEIS. The Level 1 screening criteria include the following:

- Improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers;
- Maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating times; and
- Improve access to the airport and efficiency of the on-airport roadway system.

For an alternative to continue to the Level 2 screening analysis, it had to meet all of the Level 1 screening criteria. Those alternatives that did not meet all of the Level 1 screening criteria were not retained for further evaluation in this FEIS.

TABLE 2.4-1
THREE-LEVEL ALTERNATIVES SCREENING ANALYSIS

Evaluation Level	Evaluation Criteria	Alt. 1	Alt. 2	Alt. 3*	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8
							Central Core Sites		
		New Airport	Other Airports	No - Action* Alternative	South Airfield Site	West Airport Site	Airport Development Program	Expansion of Existing Facilities	North Airfield Site
Level 1 Purpose and Need	Improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers.	No	No	No	No	Yes	Yes	No	Yes
	Maintain safety and Improve efficiency of aircraft ground movements.	No	No	No	Yes	Yes	Yes	No	Yes
	Improve access to the airport and efficiency of the on-airport roadway system.	No	No	No	Yes	Yes	Yes	No	Yes
Continue to Level 2? Yes or No		**No**	**No**	**Yes**	**No**	**Yes**	**Yes**	**No**	**Yes**
Level 2 Site Acceptability	Runway Configuration and Layout			Yes		No	Yes		Yes
	Proximity to Airfield and Runway Ends			Yes		No	Yes		Yes
	Ability to Meet Aircraft Fleet Mix Requirements			No		Yes	Yes		Yes
	Interstate and Regional Surface Access			Yes		Yes	Yes		Yes
	Reasonableness			No		No	Yes		Yes
Continue to Level 3? Yes or No				**Yes**		**No**	**Yes**		**Yes**
LEVEL 3 Constructability and Environmental	Land acquisition (acres)			0			16		250
	Relocations: Residential (number)			0			0		39
	Commercial/Industrial (acres)			0			16		88
	Infrastructure impacts			No			Yes		Yes
	Maintenance of airport operations			Yes			Yes		Yes
	Section 303(c) sites: direct (#of sites)			0			0		0
	Historic resources: direct (#of sites)			0			0		--
	Wetland impacts (acres)			0			0		0
	Floodplain impacts (acres)			0			Yes		Yes
	Hazardous materials/site contamination			No			Yes		No
Analyze in Chapter 4: Environmental Consequences?				**Yes**			**Yes**		**No**

* No-Action Alternative will be retained for detailed analysis for baseline comparative purposes and to fulfill CEQ regulations, Sections 1502.14 and FAA Orders 5050.4A and 1050.1E implementing NEPA.

Source: URS Corporation, 2004.

2.4.1.1 New Airport (Alternative 1)

Construction of a new airport to replace or augment PHX is not considered reasonable when compared to the proposed action. This alternative would require a substantial capital investment and commitment of resources to provide the infrastructure required to support a major airport. Major areas of concern associated with a new airport site include operational authority to move aircraft operations, the development cost of the new facility, development cost of new infrastructure, access to highways and mass transit facilities, availability of a sponsoring organization (such as a local government or airport authority), community acceptance, financial feasibility, potentially significant environmental impacts, and potential airspace conflicts. To date, no sponsor has come forward to support development of a new air carrier airport.

Development of a new airport would provide an opportunity to incorporate up-to-date security systems and layouts in the airport design. Security systems would address a range of design considerations including airport access, passenger screening, and baggage monitoring systems. However, due to the major areas of concern as identified above, the FAA has determined that construction of a new airport as an alternative to the proposed project at PHX is not a reasonable alternative and, therefore, was not retained for further consideration in this FEIS

2.4.1.2 Use of Existing Airports (Alternative 2)

The use of other airports would not meet the objective of the City of Phoenix to improve facilities and access at PHX, to balance capacity of landside and airside facilities, and to accommodate forecast demand at PHX more efficiently and at a level of service consistent with historic practice. Nonetheless, the potential for other airports within the greater Phoenix area to handle some of the forecast demand for PHX and thereby alleviate the congestion and shortfalls in the existing facilities at PHX was considered.

To potentially address the purpose and need for the proposed terminal and associated improvements at PHX, the use of other airports would have to accommodate approximately 2.8 million passengers in 2015. Results of a terminal demand/capacity study performed for the proposed West Terminal development at PHX indicate that if it is not developed, the forecast demand from domestic airlines operating at PHX would exceed the design capabilities of the existing terminal facilities when operating at its desired level of service by as much as 2.8 million passengers and 670,000 operations per year beginning in 2015.

Whether it is feasible to use other airports to alleviate congestion and improve the efficiency of operations at PHX depends upon a number of factors, including physical site limitations, ownership, market demands, willingness and ability to upgrade the airport, community relations, and natural supply and demand forces unique to the air transportation industry. In addition, the State has prepared an aviation system plan. Each airport serves a distinct role in the regional and state systems plans. Each airport contributes to the ability of the overall network to meet the long-term air transportation needs of the region and the state. Use of the airports in the Phoenix/Maricopa County area must accordingly be evaluated with in terms of how it would affect each airport as part of a larger interlocking airport system that serves the aviation needs of the entire region and state. These factors are discussed in more detail below.

Background - There are eight potential supplemental airports in the vicinity of PHX, including one military airfield, Luke Air Force Base (AFB). The City of Phoenix owns Phoenix Deer Valley and Phoenix Goodyear Airports as well as PHX. State, local, and tribal governments own and operate the remaining five airports (Falcon Field-City of Mesa, Chandler Municipal-City of Chandler, Glendale Municipal-City of Glendale, Scottsdale Airport (SDL)-City of Scottsdale and the Williams Gateway Airport (IWA)-Williams Gateway Airport Authority). The Williams Gateway Airport Authority consists of the City of Mesa, Towns of Gilbert and Queens Creek and Gila River Indian Community. The Federal Government owns and operates Luke Air Force Base exclusively for military purposes.

Designated Reliever (General Aviation) Airports and Luke AFB - Phoenix Deer Valley, Phoenix Goodyear, Falcon Field, Chandler Municipal, Glendale Municipal, and Scottsdale Municipal airports are designated reliever airports for general aviation operations in the FAA's National Plan for Integrated Airport Systems (NPIAS) and in the Regional Transportation Plan. Phoenix Goodyear, Glendale, Scottsdale each has a single runway. While Deer Valley, Falcon Field, and Chandler each have two parallel runways, none have sufficient separation to permit dual-parallel simultaneous instrument approaches during instrument weather (low visibility) conditions. Without such capability these airports will not have the capacity to substantially alleviate congestion and reduce the shortfall in terminal and other facilities at PHX in 2015. Given the limited airfield capacity and the roles planned for these six airports, none; with the possible exception of Scottsdale; is suitable for, or amenable to, air carrier activity with large jet aircraft. Phoenix Goodyear had 17 passenger enplanements in 2002 from a private charter. Charter service is similar to commercial and other passenger airline service except that it is on an unscheduled basis.

The City of Phoenix and the Cities that own Falcon Field, Chandler Municipal, or Glendale Municipal airports have no plans to upgrade their respective general aviation airports to serve air carriers during the forecast period. Luke AFB is currently in exclusive use for military operations. Similarly, the Federal Government has no plans to convert or close the base to permit civilian operations beginning in 2015. For these reasons, Phoenix Deer Valley, Phoenix Goodyear, Falcon Field, Chandler Municipal, Glendale Municipal, and Luke AFB are not retained for further consideration as reasonable alternatives to alleviate future congestion and shortfalls in terminal facilities at PHX.

Overview of Scottsdale Municipal and Williams Gateway - Use of Scottsdale and Williams Gateway airports, either individually or in combination, merits further consideration. Scottsdale alone amongst the other designated general aviation reliever airports in the Phoenix area had commercial airline sightseeing service and recently received expressions of interest from several air carriers. Williams Gateway, alone of the eight airports in the Phoenix/Maricopa County area, has three runways and is certificated by the FAA to serve air carrier aircraft. FAA recently amended Part 139 to define air carrier aircraft more broadly as aircraft designated to carry more than 9 passengers. Previously, Part 139 certification was required to service air carriers operating aircraft having 30 or more seats. Williams Gateway is designated in the RASP as a reliever airport for commercial service at PHX. Scottsdale and Williams Gateway currently service approximately 10,000 and 25,000 passengers annually on private charter flights, respectively.

Scottsdale Municipal - In the early 1990s, a small commercial airline, Scenic Airlines, flew as many as 600 passengers a day on sightseeing trips from SDL to the Grand Canyon National Park. Shortly after

the airport's terminal was refurbished in 1995, Scenic went out of business. The prospect of commercial service at Scottsdale arose again 10 years later, in the fall of 2005. At this time Vision Air and two other air carriers expressed interest in starting commercial service from SDL to Las Vegas, Los Angeles and San Diego. The Scottsdale City Council scheduled for a vote the matter of whether to approve pursuit of commercial service and the necessary certification from the FAA to accept commercial service.

According to news media reports, the proposal to add commercial service was controversial. The business community and the Chamber of Commerce supported the proposed commercial service, but there were concerns about how planned commercial operations would impact general aviation. On November 1, 2005, after hearing protests from airport neighbors, homeowners' association directors, and civic leaders about issues such as increased aircraft noise, the Scottsdale City Council voted against commercial service at SDL.

Businesses constituting the Scottsdale Airpark surround the airport. SDL is a base for and serves private aircraft, corporate jet aircraft, 14 charter services, helicopters, and several flight schools. SDL has a single runway and averages approximately 194,472 operations annually (Air Traffic Activity Data System, 2004). Due to the lack of service by air carriers operating large jet aircraft since at least 1978[1], recent local protests against renewed commercial service and the requisite Part 139 certification, and finally the sponsor's decision in November 2005 not to pursue such service and certification indicate that use of SDL is not a viable alternative.

Williams Gateway - Williams Gateway Airport currently serves over 2,000 passengers annually on Allegiant Air charter flights to Reno and Laughlin. In 2006, Vision Air will begin service of four flights a week from Williams Gateway to North Las Vegas on a 30-seat turboprop aircraft. Williams Gateway has surplus capacity and facilities in place to accommodate an increased level of charter passenger service. The regional freeway system in the Phoenix area is being expanded and will provide increased freeway access to Williams Gateway in the 2006/2007 timeframe. The City of Phoenix believes that Williams Gateway could have a significant role in providing future air carrier service to the greater Phoenix/Maricopa County area. The City of Phoenix has accordingly supported the development of air carrier and cargo service at IWA. The FAA is currently working with the Williams Gateway Airport Authority to ensure that the operations will be conducted safely and in accordance with FAA standards and procedures.

Yet, the practical capacity of Williams Gateway to alleviate congestion at PHX beginning in 2015 is potentially limited by the proximity of its three parallel runways and airspace conflicts with PHX. The centerlines of the two outermost runways are presently too close together to permit dual-parallel simultaneous instrument approaches. As a result, Williams Gateway lacks the capacity to substantially alleviate congestion and reduce the shortfall in terminal and other facilities at PHX in 2015. The Maricopa Association of Governments (MAG) investigated the feasibility of building a new east/west runway or

[1] In April 1978, the Scottsdale and Phoenix City Councils entered into a joint resolution to coordinate aeronautical services to area residents. The City Councils of these cities agreed that SDL would be permitted to provide charter service; however, PHX would be the only airport to provide service by air carriers using large jet aircraft such as Boeing 747s. The enactment of the Airline Deregulation Act of 1978 (ADA) superseded this local agreement. The ADA provides that federal and state governments may not control airline rates, routes, and services.

multiple parallel east/west runway(s) at Williams Gateway to align traffic flows at PHX with Williams Gateway. Concerns regarding noise and other environmental impacts have been expressed as development continues in communities surrounding the airport such as the Towns of Gilbert and Queens Creek. While an east-west runway could provide additional capacity to the region, in certain conditions actual operation of the new runway could reduce the actual capacity of the airport by affecting the ability to continue to use the three parallel runways which are oriented northwest to southeast. The realignment of runways at Williams Gateway could also negatively impact the ability of the military to use airspace near Luke AFB to train pilots (MAG, 2004). Although the concept for east-west runway development at Williams Gateway has been eliminated from consideration in MAG's Regional Aviation System Plan Update, the airport will continue to provide alternate commercial airline service as a supplement to PHX.

Airline Strategic Decisions - Finally, any substantial redistribution of traffic from PHX to other airports such as Scottsdale and Williams Gateway would require airline strategic decisions that cannot be predicted or relied upon. The United States enacted Public Law 95-504, entitled the "Airline Deregulation Act of 1978," to deregulate the airline industry. As a result of deregulation, natural supply and demand factors unique to air transportation govern the level of aviation activity demand at national, regional, and local market levels. The Federal Government does not control where, when and how airlines provide their services. Rather, the aviation industry, in partnership with local and regional government and in response to market demand, determines where and how air travel demand is accommodated. Local governments like the City of Phoenix that own several airports have limited authority to specialize the roles of their airports and encourage use of those airports consistent with those roles. Because the Federal Government cannot direct airlines to serve Williams Gateway and/or Scottsdale, Phoenix does not own or operate Williams Gateway or Scottsdale, any ability to use these airports to offset demand at PHX is speculative. Accordingly, for the reasons discussed above, use of Scottsdale and/or Williams Gateway would not meet Level 1: Purpose and Need criteria to improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers. Use of these airports is therefore not retained for detailed study in this EIS.

Based on the analysis presented above, the FAA has determined that the use of other airports as an alternative to the proposed project at PHX is not a reasonable alternative; therefore, this alternative was not retained for further consideration in this FEIS

2.4.1.3 No Action Alternative (Alternative 3)

The No-Action Alternative would not meet the stated purpose and need for the proposed Airport Development Program. The No-Action Alternative would necessitate the use of remote gates to accommodate the number of passenger enplanements projected for the future, and require the busing of passengers between aircraft and passenger processing facilities (see **Figure 2.3.2-1**). The busing of passengers would impact the efficiency of airport operations and could subject passengers to the adverse conditions, including temperatures in excess of 105° F that exist in the Phoenix area during summer months. Busing and remote gate operations would also result in safety and security concerns that could significantly impede passenger processing activities and further reduce the level of service consistent with historical standards. Additional security systems and personnel could be required to move passengers between the terminal areas and hard stand aircraft locations. The need for additional security monitoring

equipment could further reduce the amount of space available for passenger processing. In addition, without substantial modifications to the existing Terminal 2 facilities, the airport would not have the ability to assure compliance with ADA requirements relating to the ability to move disabled passengers between the terminal and aircraft at remote gate positions.

Under the No-Action Alternative, Sky Harbor Boulevard would not be improved and the Stage 2 APM would not be constructed. Surface transportation analysis for the No-Action Alternative indicates that the future increase in daily passenger traffic and employee and service traffic would result in high to severe levels of congestion on Sky Harbor Boulevard during peak traffic periods (*West Terminal EIS Future Traffic Condition - 2015 No Build Alternative, HDR Engineering, June 2003*). Absence of the Stage 2 APM would further increase traffic and congestion on Sky Harbor Boulevard as passengers transit to and from the RCC.

Although the No-Action Alternative would not meet the stated purpose and need, this alternative was retained for detailed analysis in this FEIS for comparative purposes, to fulfill CEQ regulations (40 CFR Part 1502) implementing NEPA, and to comply with FAA Order 5050.4A and FAA Order 1050.1E.

2.4.1.4 South Airfield Site (Alternative 4)

Alternative 4, located on a site on the south side of the airport, was investigated as an alternative terminal development site. The area is currently utilized by the Arizona Air National Guard (ANG) and a mix of commercial air cargo and aviation operators. Results of the Level 1 analysis indicate that the South Airport site is not practicable because it is too small for the development of terminal facilities and supporting infrastructure capable of meeting future passenger demand through 2015. Development in this area would also require relocation of existing facilities including general aviation, cargo, and the ANG. This could impact the near- and long-term mission objectives of the ANG. The ANG was recently relocated to its present location to accommodate new Runway 7R/25L. An additional relocation of the ANG could necessitate the relocation of the ANG to another airport. Because of the significant capital expense and impact to the ongoing ANG mission, any additional relocation or modification of existing ANG facilities to accommodate PHX operations should be avoided. Development of new terminal facilities at this location would provide an opportunity to incorporate up-to-date security systems and layouts in the airport design. Security systems would address a range of design considerations including airport access, passenger screening, and baggage monitoring systems.

The South Airport Site is located in close proximity to both interstate and regional roadway systems. However, the ability to develop a surface transportation network having adequate capacity to serve the new terminal and associated facilities is severely restricted by the location of I-10 and the Salt River. The site does not contain adequate land area to develop the entrance and exits ramp structures needed to access the interstate system or other regional roadways.

Based on this analysis, the FAA determined that this site does not meet the Level 1 Purpose and Need criteria and will not be carried forward for analysis in the Level 1 Site Review.

2.4.1.5 West Airfield Site (Alternative 5)

The development of terminal facilities at the west airfield site could be constructed and consistent with the purpose and need for the proposed project. New terminal facilities, developed as part of Alternative 5, could be sized to accommodate projected passenger demand and designed to meet the level of service to passengers consistent with historical standards. Development of new terminal facilities at this location would provide an opportunity to incorporate up-to-date security systems and layouts in the airport design. Security systems would address a range of design considerations including airport access, passenger screening, and baggage monitoring systems.

Alternative 5 would provide for development of the Stage 2 APM and provide connection with the existing Stage 1 APM at Terminal 3, the RCC, and the Valley Metro Light Rail System (VMLRS) west of I-10 along Jefferson Street. The APM Stage 1, RCC, and VMLRS have independent utility from the West Terminal project and have been evaluated in other NEPA studies. The FAA has determined that Stage 1 of the APM will be built and operated regardless of whether Stage 2 is built and operated. Consistent with the purpose and need for the proposed project, the new crossfield taxiways "U" and "V" would be constructed and Sky Harbor Boulevard would be realigned to improve traffic flow.

Based on FAA's review, it was determined that Alternative 5 met the Level 1 Purpose and Need screening criteria and was, therefore, carried forward for analysis in the Level 2 screening.

2.4.1.6 Airport Development Program (Alternative 6)

Alternative 6 would meet the purpose and need criteria and is the Sponsor's proposed project. Development of the West Terminal would provide sufficient gate capacity to efficiently meet the future demand for domestic and international passengers through the 2015 forecast period. Additional terminal facilities would balance the operational capacity of the airfield with the capacity of the terminals to process passengers. The additional contact gates provided by the West Terminal would preclude the need to use remote gates and would provide a high level of service to passengers consistent with historical standards. Development of new terminal facilities at this location would provide an opportunity to incorporate up-to-date security systems and layouts in the airport design. Security systems would address a range of design considerations including airport access, passenger screening, and baggage monitoring systems. The development of the dual crossfield taxiways and improvements to the airport's surface transportation system would improve operational efficiency and airport access. The availability of the APM Stage 2 would further reduce congestion on the surface roadway system, improve passenger access to airport facilities, and provide access to the Valley Metro Light Rail Transit system.

Based on this analysis, it was determined that Alternative 6 met the Level 1 Purpose and Need screening criteria and was, therefore, carried forward for further analysis in Level 2.

2.4.1.7 Expansion of Existing Facilities (Alternative 7)

Alternative 7 would not meet the Level 1 purpose and need criteria for the proposed project at PHX. Alternative 7 would not improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand through the planning horizon and maintain an acceptable level of service to passengers. Expansion of Terminal 3 would provide additional contact gates but would also require the use of remote gates or hardstand locations in order to meet the projected need for domestic passenger handling capacity. The use of remote gates would not meet PHX's objective to provide a level of service consistent with historical practice, such as the ability to accommodate disabled passengers. Development of new terminal facilities at this location would provide an opportunity to incorporate up-to-date security systems and layouts in the airport design. Security systems would address a range of design considerations including airport access, passenger screening, and baggage monitoring systems. The busing of passengers would impact the efficiency of airport operations and could subject passengers to the adverse weather conditions as experienced in Phoenix during the summer months. As discussed for the No-Action Alternative, Alternative 3, the busing of passengers and use of remote gates would impact safety and security at the airport and further reduce the level of service to passengers. Because no additional gates would be constructed, Alternative 7 does not include any provision to increase gate capacity for international operations or increased FIS facilities. As a result, opportunities for the expansion of international air carrier operations at PHX would be limited with Alternative 7.

As a supplement to the Alternative 7 concept previously discussed in **Section 2.3.2.5**, the expansion of Terminal 3 was considered without the use of remote gate and hardstand operations (Terminal 3 Expansion Alternative, DMJM/HDR, August 2003). This Terminal 3 concept would provide sufficient gate and passenger processing facilities to efficiently meet forecast demand at PHX through 2012, but would not adequately meet airport needs through the 2015 planning horizon consistent with historical practice at the airport. In order to meet PHX's objectives, additional facilities would need to be constructed in the future to meet passenger needs and balance the operational abilities of the existing airside and landside facilities.

Based on this analysis, it was determined that Alternative 7 did not meet the Level 1 Purpose and Need screening criteria and was, therefore, not carried forward for further analysis in Level 2.

2.4.1.8 North Airfield Site (Alternative 8)

Results of the Level 2 review of Alternative 8 found that the development of terminal facilities at the north airfield site could be accomplished consistent with the purpose and need for the proposed project. New terminal facilities developed at this location could be sized to accommodate projected passenger demand and designed to maintain an acceptable level of service to passengers.

Alternative 8 would provide for development of the Stage 2 APM and provide connection with the existing Stage 1 APM, the CRR, and the Valley Metro Light Rail System (VMLRS). The APM Stage 1, CRR and VMLRS have independent utility from the North Airfield Site, and have been evaluated in other NEPA studies. The FAA has determined that Stage 1 of the APM will be built and operated regardless of whether Stage 2 is built and operated. Consistent with the purpose and need for the proposed project, the new crossfield taxiways "U" and "V" would be constructed and Sky Harbor Boulevard would realigned to improve traffic flow. Development of a new terminal would provide an opportunity to incorporate up-to-

date security systems and layouts in airport design. Security systems would address a range of design considerations including airport access, passenger screening, and baggage monitoring systems.

Based on FAA's review, it was determined that Alternative 8 met the Level 1: Purpose and Need screening criteria and was, therefore, carried forward for analysis in the Level 2 screening.

2.4.1.9 Level 1 Screening Summary

As a result of the detailed assessment and analysis of each of the eight ADP alternatives in the Level 1 screening process, three build alternatives (Alternatives 5, 6, and 8) met all of the Level 1 purpose and need criteria (see **Table 2.4-1**). These three alternatives were retained for further evaluation in the Level 2 screening process. All of the other alternatives evaluated failed to meet one or more of the Level 1 purpose and need screening criteria and were, therefore, not retained for further evaluation. The No-Action Alternative was retained for Level 2 screening evaluation to fulfill CEQ regulations implementing NEPA.

2.4.2 LEVEL 2 SCREENING

In the Level 2 screening, the FAA considered each of the remaining alternatives to determine if they could effectively and efficiently accommodate terminal facilities large enough and with sufficient design flexibility to meet the projected future passenger demand. Evaluation criteria used in the Level 2 screening are listed below and have been previously summarized in **Section 2.2.2**:

- Runway configuration and layout,
- Proximity to airfield and runway ends,
- Ability to meet aircraft fleet mix requirements,
- Interstate and regional surface access, and
- Reasonableness of site location.

2.4.2.1 No-Action Alternative

The No-Action Alternative would maintain the PHX airside and landside facilities in their current configuration. For procedural purposes, it was retained in accordance with CEQ regulations for further consideration in the Level 3 screening for comparative purposes and thus ensure a complete FAA environmental impact evaluation.

2.4.2.2 West Airfield Site

Development of a terminal complex at this site may impact one or more critical local roadways that serve as regional access routes to and from the airport. Development of passenger terminal facilities at this location could also present interconnectivity challenges with the existing centrally located terminal system, and local, regional and interstate surface access system. The placement of terminal facilities to the west of I-10 could require significant upgrade and/or modifications to the existing ground control and taxiway systems at PHX. Modifications to the ground control system and taxiway system could have a significant impact on airport operations. Development of the West Airfield Site could also limit future development and expansion, if required to meet passenger demand, of the RCC which is under construction. Therefore, Alternative 5 would not meet the site evaluation criteria for the proposed project at PHX and was not carried forward for analysis in the Level 3 screening.

2.4.2.3 Airport Development Program

The Airport Improvement Program which is the Sponsor's proposed project was evaluated by the FAA with respect to the Level 2 Site Review criteria. Development of the West Terminal and associated airport improvements is consistent with the City's long range plans for the airport and would provide a balance between the operational capacity of the existing three-runway airfield and landside passenger processing facilities.

Because this alternative is located in the "central core" of the airport between the north and south runways, it provides efficient access to two of the airport's three parallel runways and supporting parallel and connector taxiway systems, and offers the shortest taxi distance to each of the six runway ends. With the Airport Improvement Program Alternative the ability to access local, regional, and national interstate surface transportation systems would remain unchanged from existing conditions at the airport.

Based on this analysis, the FAA determined that this site met the Level 2 Site Review criteria and was carried forward for analysis in the Level 3 screening.

2.4.2.4 North Airfield Site

Passenger terminal facilities developed at this site would likely be of single-sided linear design with adjacent apron area and a dual parallel taxiway system. There is sufficient land area to develop facilities capable of accommodating the full range of aircraft types required to meet the aviation forecast for PHX. The land areas north of Runway 8/26 would allow direct and unrestricted access to the airport's runway system. However, access to Runway 7L/25R and Runway 7R/25L would require crossing of active Runway 8/26 and the Terminals 3 and 4 taxiway system.

Development of this alternative would require the construction of surface roadways to connect existing Terminals 3 and 4 with facilities constructed at the North Airfield Site.

Based on this analysis, the FAA determined that this site met the Level 2 Site Review criteria and was carried forward for analysis in Level 3.

2.4.2.5 Level 2 Screening Summary

As a result of the initial assessment and analysis of each of the alternatives in the Level 2 screening process, Alternatives 6 and 8 were found to meet the Level 2 Site Review criteria (see Table 2.4-1). Those alternatives satisfying the Level 2 criteria were retained for further evaluation in the Level 3 screening process. For procedural purposes, the No-Action Alternative was retained for Level 3 screening for comparative purposes.

2.4.3 LEVEL 3 SCREENING

The terminal alternatives retained through the Level 2 analysis (as well as the No-Action Alternative) were carried forward to the Level 3 screening process, which evaluated the alternatives in terms of constructability and environmental impacts.

2.4.3.1 No-Action Alternative

The No-Action Alternative infers a new terminal and associated improvements would not be developed at PHX. This alternative would, therefore, involve neither new construction of airside and landside facilities associated with the proposed terminal nor any other PHX development (beyond those which the FAA has previously approved and are already programmed or undertaken by the City of Phoenix, and those needed to maintain airport operations). The No-Action Alternative would result in no relocation of residences or businesses, no acquisition of property, and no adverse impacts to wetlands or 100-year floodplains. Similarly, this alternative would not result in impacts to Section 4(f) public resources nor impacts to Section 106 Historic Resources.

For procedural purposes, the No-Action Alternative was retained in accordance with CEQ regulations for detailed analysis in this FEIS.

2.4.3.2 Airport Development Program

Construction of the proposed ADP Alternative (Alternative 6) would impact 16 acres of off-airport property. The APM Stage 2 (and associated maintenance facility) would be partially located off airport property in areas that are currently classified as commercial and industrial land uses. Construction in the Grand Canal floodplain would be required. The construction and operation of the West Terminal would include the realignment of Sky Harbor Boulevard. During construction, some short-term disruption in the normal traffic flow along Sky Harbor Boulevard would be anticipated. Following construction, traffic flow and congestion along the Sky Harbor Boulevard would be improved. No residences would need to be relocated as a result of the implementation of Alternative 6.

Development activities associated with Alternative 6 would result in no impacts to wetlands or direct impacts to Section 4(f) public resources. Demolition of Terminal 2 would require relocation of the Coze Mural, a historically significant resource. Relocation of this mural would be accomplished in accordance with all SHPO and City Historic Preservation office requirements.

The Terminal 2 area contains a plume of petroleum products which over time have caused both soil and groundwater contamination. The release of jet fuel at the Terminal 2 area was discovered in 1997 near the northeast corner of Terminal 2 Parking Garage. A cleanup was conducted in the immediate vicinity of the release, which was followed up with a comprehensive assessment and remediation program. Arizona Fueling Facilities Corporation (AFFC), the responsible party for the release, has been conducting the assessment and remediation activities. Subsequent to their definition of the extent of the product plume, AFFC's consultants designed and operated a remediation system to recover the free product floating on the groundwater table. The system was a dual-phase recovery system that extracted free product and groundwater from the subsurface. The water pumping draws down the water table to facilitate more efficient collection of the residual free product in the recovery wells. The system has been operated since 2001. In 2005, AFFC added bioventing to the remediation program. It is being implemented in three phases in the areas of the plume. Two of the phases have been constructed and are in operation. The third phase will be constructed in 2006 after pilot testing and design.

The Motorola 52nd Street Superfund site/Honeywell 34th Street Facility has been included by the EPA on their National Priorities List of Superfund sites. The contamination conditions resulted from releases of Chlorinated Volatile Organic Solvents (CVOCs) from the Motorola 52nd Street and Honeywell facilities. In addition, petroleum products, primarily jet fuel, emanate from the Honeywell 34th Street facility and have commingled with the CVOCs. The contaminant plumes have migrated onto the airport. Currently, consultants representing the Potentially Responsible Parties (PRPs) for the Honeywell site are assessing the site conditions and have begun planning for remediation of the jet fuel. On October 7, 2005, the ADEQ approved the Corrective Action Plan for the Honeywell 34th Street Facility (see **Appendix A** of this FEIS).

Data published by the ADEQ in the *Motorola 52nd Street Superfund Site Update Report,* dated February 2005, indicates that the contaminant plume has not migrated into the area proposed for APM development. However, in ADEQ correspondence to the FAA following release of the ADP DEIS, ADEQ identified parcels that are potentially to become part of the APM station at 44th and Washington Streets and of the APM Maintenance Facility. ADEQ believes that these parcels and the underlying groundwater are potentially contaminated with chlorinated solvents. The facilities proposed for this area will be largely at or near grade and will not require extensive excavation. Groundwater contamination conditions are not likely to have a significant impact on the project. However, the City will conduct appropriate due diligence for acquisition of the parcel and as a part of the design of the proposed facilities. The City of Phoenix does not believe that either the jet fuel free product or the dissolved phase CVOC plumes from the Honeywell site would impact the proposed project.

Based on results of the Level 3 screening, Alternative 6 was retained for detailed analysis in this FEIS. A complete discussion of environmental impacts associated with this alternative is contained in **Chapter 4.0** (Environmental Consequences).

2.4.3.3 North Airfield Site

The North Airport Site would involve the construction of a passenger terminal complex on a site located north of Runway 8/26 (see **Figure 2.3.2-2**). This site is bounded by E. Washington Street to the north, 24th Street to the west, and Hohokam Parkway (State Road 143) to the east. This area has been identified by the City of Phoenix Aviation Department as a future acquisition area to be designated for airport use and is currently in a voluntary acquisition program. Program land area requirements in a narrow east-west configuration south of Washington Street would total approximately 218 acres, approximately 100 of which is Airport property, including land for landside access corridors connecting to the local roadway network and to existing terminal access roadways and to the proposed APM.

Airfield access would be provided by relocating the Union Pacific right-of-way (ROW) to Washington Street, potentially in conjunction with development of the City of Phoenix proposed Light Rail Transit system ending at SR 153. In addition to land acquisition for the Union Pacific ROW (see overall land acquisition costs described below), relocation costs have been separately estimated at $300 million.

Additional costs associated with airport development in this area also include relocation and environmental cleanup of Honeywell facilities currently on leased airport property. The Motorola 52nd Street Superfund site/Honeywell 34th Street Facility has been included by the EPA on their National Priorities List of Superfund sites. The contamination conditions resulted from releases of Chlorinated Volatile Organic Solvents (CVOCs) from the Motorola 52nd Street and Honeywell facilities. In addition, petroleum products, primarily jet fuel, emanate from the Honeywell 34th Street facility and have commingled with the CVOCs. The contaminant plumes have migrated onto the airport. Currently, consultants representing the Potentially Responsible Parties (PRPs) for the Honeywell site are assessing the site conditions and have begun planning for remediation of the jet fuel. On October 7, 2005, the ADEQ approved the Corrective Action Plan for the Honeywell 34th Street Facility (see **Appendix A** of this FEIS).Rough order of magnitude cost estimates for this effort have been separately estimated at $500 million. Locating the North Terminal Site along Washington Street to the extreme east or west end of the airport might mitigate the need to acquire the Honeywell facilities; however, airfield access to these terminal locations would be compromised.

Land requirements for this alternative are shown in **Table 2.4.3-1**, and include approximately half of the area between 24th Street and SR 153. Off-airport access to the remaining 100+/- acres (excluding streets and other public domain areas) would be restricted by the relocated Union Pacific ROW and could better serve airport support functions and are, therefore, included for acquisition. Land costs, based on recent acquisitions and appraisals in the area are included at a rough order of magnitude estimate of $1 million per acre, provided by the City of Phoenix Aviation Department.

TABLE 2.4.3-1
ACQUISITION COSTS

	Acres	Cost ($ millions)
North Terminal Site	120	$120
Expanded Washington Street/Union Pacific ROW	30	$330
Remaining Land Between 24th Street and SR 153	100	$100
Honeywell Relocation and Remediation		$500
Total	**250**	**$1,050**

The North Airfield Site is developed predominately in commercial and industrial uses. Acquisition and development of this site will disturb existing environmental conditions, requiring potentially substantial clean-up and remediation. Approximately 57 single family and 12 duplex residential units are located within the North Terminal Site (compared to none in the West Terminal Site). Each of the units would have to be acquired and the families relocated, many probably in advance of the normal progress of the voluntary property acquisition program, causing community and neighborhood disruption.

In addition, more aircraft activity, including movement of aircraft to gates and engine starts, would take place closer to the residential and commercial areas north of Washington Street, which could have a detrimental effect on noise and air quality.

Finally, several hundred acres of commercial/industrial property would be removed from local use, compared to the West Terminal alternative, potentially reducing economic activity in the area and contributing to urban sprawl.

While program requirements can be met on the North Airfield Site, acquiring and preparing the site for construction would be slower than for the proposed West Terminal Site. Acquisition of properties through normal volunteer processes would take several years. Acquisition through condemnation proceedings could lead to extended court actions and increased costs. Significant source area investigation and remediation work would need to be conducted if all of the buildings were to be demolished for construction of the terminal. Once ROW is acquired, relocation of the Union Pacific track would take additional years, depending upon site conditions and environmental issues. The overall result is that the North Terminal Site may not meet airport activity demand requirements. The North Airfield Site is outside the existing terminal core area and would, therefore, require separate access, with degraded passenger flow, inter-terminal access and way-finding issues. Additional runway crossings would be required for aircraft landing and taking off on the south airfield. Finally, airport infrastructure does not exist to support the North Terminal Site, as it does for the West Terminal Site. Shared use of existing facilities would be much diminished leading to additional costs, lower efficiencies, and longer development times.

Because of the proximity of residential and commercial areas north of Washington Street, construction impacts may be more severe than with the West Terminal alternative, including air and water quality, construction noise, and construction vehicle activity on local streets. Depending upon the configuration of landside access to the North Airfield Site, local traffic may be adversely affected by increased airport traffic on local streets, affecting air quality, roadway and intersection capacity and delays.

Development activities associated with Alternative 8 would result in no impacts to wetlands or direct impacts to Section 4(f) public resources. Demolition of Terminal 2 would require relocation of the Coze Mural, a historically significant resource. Relocation of this mural would be accomplished in accordance with all SHPO and City Historic Preservation office requirements.

Based on FAA's review, it was determined that Alternative 8 would not meet the Level 3: Constructbility and Environmental screening criteria and was, therefore, not carried forward for analysis.

2.4.3.4 Level 3 Screening Summary

As a result of the assessment and analysis of each of the alternatives in the Level 3 screening, two alternatives (No-Action and Alternative 6) were retained for further detailed environmental analysis in this FEIS. The primary constraints affecting other alternatives at this level of screening proved to be the number and type of property acquisitions required, the impact to adjacent land use, and the requirement for extensive environmental remediation associated with the Motorola 52nd Street/Honeywell 34th Street facilities.

This analysis presented a preliminary screening of these alternatives in terms of selected environmental impacts, including direct and indirect impacts to wetlands, 100-year floodplains, Section 4(f) resources, and Section 106 historic resources. The complete investigation and discussion of the affected environment and the analysis of potential environmental consequences (or impacts) for the two remaining alternatives are found in Chapters 3.0 and 4.0, respectively, in this FEIS.

2.5 DESCRIPTION OF ALTERNATIVES RETAINED FOR DETAILED ANALYSIS

2.5.1 NO-ACTION ALTERNATIVE

The No-Action Alternative assumes the proposed West Terminal Complex and associated improvements would not be developed. Terminals 2, 3, and 4 would continue to serve as the passenger processing facilities at PHX. Crossfield taxiways "U" and "V" and Stage 2 of the APM would not be constructed. Sky Harbor Boulevard would not be realigned or improved. The No-Action Alternative would necessitate the development and use of remote gate positions to help accommodate the projected number of passenger enplanements. Figure 2.3.2-1 illustrates a conceptual remote gate configuration to accommodate future passenger demand under a No-Action Alternative. The No-Action Alternative would necessitate the interior conversion of Terminal 2 to an airfield bus terminal to serve remote aircraft parking positions. This facility would have no contact gate positions and would be renovated internally to provide increased passenger processing.

2.5.2 AIRPORT DEVELOPMENT PROGRAM

The ADP, as described in **Section 1.1.1**, would replace the existing Terminal 2 and provide for the construction of a new West Terminal and associated improvements at PHX. The proposed West Terminal would be constructed west of Terminal 3 on the existing Terminal 2 site (**Figure 2.3.2-3**). This site is located in the central core of the airport along Sky Harbor Boulevard, between Runway 8/26 and Runway 7L/25R.

The ADP Alternative consists of the following projects:

- Demolition of Terminal 2 and Ancillary Facilities,
- West Terminal Development (33-Gate Terminal), Garage and Terminal Roadways,
- Modifications to Terminal 4, Concourse N4 International Gates,
- Construction of Crossfield Taxiways Uniform "U" and Victor "V",
- Sky Harbor Boulevard Modifications, and
- Construction of Stage 2 of the Automated People Mover System (APM).

The West Terminal would be designed to accommodate operations for domestic airlines currently operating in Terminal 2, plus excess demand for domestic airlines currently operating in Terminal 3. In addition, all international airlines, except for America West's international service, would be located in the West Terminal. The ADP Alternative would address the Terminal Area Demand Capacity Analysis (DMJM Aviation/HDR, 2004) forecasts for PHX through the year 2015.

2.6 PREFERRED ALTERNATIVE

Under 40 CFR 1502.14, Federal agencies are required to identify a "Preferred Alternative" in the Final EIS. As defined in CEQ's 40 Questions and Answers about the NEPA regulations, "The 'agency's preferred alternative' is the alternative which the agency believes would fulfill its statutory mission and responsibilities, given consideration to economic, environmental, technical, and other factors."

The EIS considered a total of eight on-airport and off-airport alternatives. After careful screening of all potential impacts and consideration of agency and public comments, one build alternative, the Sponsor's proposed ADP project, and the No-Action Alternative were retained for detailed study in the EIS. **Table 4.1-1** presents a comparison of the environmental impacts of these two alternatives.

2.6.1 ENVIRONMENTAL IMPACTS

The environmental benefits of the ADP Alternative, as compared to the No-Action Alternative, include long-term reductions in air emissions of criteria pollutants (i.e., CO, NO_x, PM_{10}, $PM_{2.5}$, and VOCs). In addition, the ADP Alternative would improve surface transportation patterns as compared to the No-Action Alternative. Moreover, the ADP Alternative would not change the level of aircraft noise impacts to the surrounding area when compared to the No-Action Alternative. On the other hand, the ADP Alternative would require the acquisition of 16.4 acres, which would involve the relocation of 14 owner-

operated businesses and 17 tenant-run businesses. Also, the ADP Alternative has the potential to affect historic properties; however, any potential adverse effects would be mitigated through a Section 106 Memorandum of Agreement executed by the FAA, State Historic Preservation Officer, and other relevant agencies. The project would also result in short-term air emissions increases during peak periods of construction. Finally, the ADP Alternative would require development in the 100-year floodplain adjacent to the Grand Canal, but the encroachment would not be significant.

2.6.2 OPERATIONAL IMPACTS

The ADP Alternative is more effective and efficient than the No-Action Alternative in meeting the FAA's Purpose and Need identified in this FEIS. As detailed below, the ADP Alternative provides substantial improvements in efficiency of terminal and ground operations and in efficiency of on-airport roadways,

2.6.2.1 Terminal Operations

The No-Action Alternative would not improve the efficiency of landside passenger facilities at PHX to accommodate forecast demand nor maintain an acceptable level of service to passengers. In contrast, the ADP Alternative would provide sufficient gate capacity to efficiently meet the forecast demand for domestic and international passengers through the 2015 forecast period while maintaining an acceptable level of service. The additional contact gates provided by the West Terminal would preclude the need to use remote gates and would provide a high level of service to passengers consistent with historical standards. Finally, development of the ADP Alternative would provide an opportunity to incorporate up-to-date security systems and layouts in the airport design. These up-to-date security systems would address a range of design considerations including airport access, passenger screening, and baggage monitoring systems.

2.6.2.2 Ground Operations

Under the No-Action Alternative, the dual crossfield taxiways would not be constructed. However, with the ADP Alternative, the development of the dual crossfield taxiways would be accomplished, and would improve the efficiency of airfield operations by facilitating the movement of aircraft between the north and south airfields and terminal complex. From a quantitative perspective, the ADP Alternative would reduce average operating time for all ground operations at PHX by an average of 0.6 minutes per aircraft as compared to the No-Action Alternative. Departing aircraft would experience the greatest reduction in average operating time of 1.2 minutes per aircraft. These gains in operational efficiency as compared to the No-Action Alternative would result in a cumulative economic benefit through the planning period of approximately $154.9 million.

2.6.2.3 Airport Access

Under the No-Action Alternative, Sky Harbor Boulevard would not be improved and the Stage 2 APM would not be constructed. Surface transportation analysis for the No-Action Alternative indicates that the future increase in daily passenger traffic and employee and service traffic would result in high to severe levels of congestion on Sky Harbor Boulevard during peak traffic periods. Under the ADP Alternative, the improvements to the airport's surface transportation system and development of the Stage 2 APM would

improve airport access and the efficiency of the on-airport roadway system. Fewer intersections would function at a level of service "F" under the ADP Alternative as compared to the No-Action Alternative in 2015 (see Table 4.20.3-2). Moreover, development of the Stage 2 APM would further reduce vehicular traffic on airport roadways as compared to the No-Action Alternative. In addition, the Stage 2 APM connection to the City of Phoenix Light Rail Transit would provide intermodal access to the airport.

2.6.3 AGENCY AND PUBLIC INVOLVEMENT

At the draft stage in the EIS process, the FAA had not identified its "Preferred Alternative" for the proposed action. The FAA believes that this decision can be made after consideration of public and agency comments received throughout the EIS process and consideration of analyses prepared after publication of the DEIS. Chapter 6.0 of this FEIS identifies the outreach conducted by the FAA to maximize the agency's evaluation of the proposed ADP project. Interested agency representatives and the public have been afforded an opportunity to review and comment on the Draft EIS and the FAA has considered the comments. Further the agency's careful scrutiny of the comments received on the Draft EIS, and the responses developed for those comments (see Appendix J) provided additional insight into the identification of the "Preferred Alternative".

2.6.4 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

In consideration of the environmental and operational parameters outlined above, the FAA has determined that the ADP Alternative, the sponsor's proposed project, is the agency's Preferred Alternative. Based on the analysis as documented in this FEIS, the ADP Alternative would meet the FAA's Purpose and Need for the proposed project to: 1) meet the needs of the National Airspace System, 2) improve the efficiency of landside passenger handling facilities at PHX to accommodate forecast demand and maintain an acceptable level of service to passengers (LFA, 2003), 3) maintain the safety of aircraft ground operations and improve the efficiency of airfield operations by reducing aircraft operating time, and 4) improve access to the airport and efficiency of the on-airport roadway system.

2.7 LISTING OF FEDERAL LAWS AND REGULATIONS CONSIDERED

The following is a list of Federal laws and statutes, Executive Orders, and regulations considered by FAA in the preparation of this FEIS.

2.7.1 FEDERAL LAWS AND STATUTES

- Airport and Airway Improvement Act of 1982 (P.L. 97-248, Title V)
- Airport and Airway Revenue Act of 1987 (P.L. 100-223, Title IV)
- Airport and Airway Safety, Capacity, Noise Improvement and Intermodal Transportation Act of 1992 (P.L. 102-581 and P.L. 103-13; 49 USC 47101, *et seq.* Recodified from and formerly known as "Airport and Airway Safety and Capacity Expansion Act of 1987" (P.L. 100-223)
- Airport Noise and Capacity Act of 1990 (P.L. 101-508; 49 USC App. 2151, *et seq.* Now recodified as 49 USC 47521, *et seq.)*

- Archaeological and Historic Data Preservation Act of 1974 (P.L. 86-253, as amended by P.L. 93-291; 16 USC 469)
- Title 49 USC 40101, *et seq.* Recodified from and formerly known as the "Federal Aviation Act of 1958," as amended (P.L. 85-726)
- Aviation Safety and Noise Abatement Act of 1979 (P.L. 96-193; 49 USC App. 2101. Recodified at 49 USC 47501)
- Clean Air Act (42 USC 7401, *et seq.*)
- Coastal Barrier Resources Act of 1982 (P.L. 97-348; 16 USC 3501-3510)
- Coastal Zone Management Act of 1972 (P.L. 92-583; 16 USC 1451-1464)
- Comprehensive Environmental Response, Compensation and Liability Act (also known as "CERCLA," as amended by "Community Environmental Response Facilitation Act," or "CEFRA," October 1992; 42 USC 9601, *et seq.*)
- Endangered Species Act of 1973 (P.L. 93-205, as amended; 16 USC 1521)
- Federal Land Policy and Management Act of 1976, Section 201(a) (43 USC 1711) (P.L. 94-579)
- Federal Water Pollution Control Act Amendments of 1972, Section 404 (P.L. (33 USC 1344) (P.L: 92-500, as amended by the "Clean Water Act of 1977," P.L. 95-217; 33 USC 1251)
- Land and Water Conservation Fund Act, Section 6(f) (P.L. 88-578; 16 USC 4601-8(f)(3))
- National Environmental Policy Act of 1969 (known as "NEPA," P.L. 91-190 (as amended; 42 USC 4321, *et seq.*) As amended by P.L. 94-52. P.L. 94-83 and P.L. 97-258, 4(b)
- National Historic Preservation Act of 1966, Section 106 (P.L. 89-665, as amended; 16 USC 470f)
- Resource Conservation and Recovery Act of 1976 (P.L. 94-580; 42 USC 6901 *et seq.*; as amended by the "Solid Waste Disposal Act of 1980," P.L. 96-482 and the "1984 Hazardous and Solid Waste Amendments," P.L. 98-616)
- 49 USC 303(c), (Recodified from, and formerly known as "Section 4(f) of the Department of Transportation [DOT] Act of 1966")
- Uniform Relocation and Real Property Acquisition Policies Act (P.L. 91-646; 42 USC 4601)
- Water Bank Act, (P.L. 91-559, as amended; 16 USC 1301, *et seq.*)
- Wild and Scenic Rivers Act (P.L. 90-542; 16 USC 1271, *et seq.*)
- Vision 100 - Century Flight Authorization Act of 2003, (49 USC 47171)

2.7.2 *EXECUTIVE ORDERS*

- Executive Order 11514 - Protection and Enhancement of Environmental Quality (dated March 5, 1970)
- Executive Order 11593 - Protection and Enhancement of the Cultural Environment (dated May 13, 1971)

- Executive Order 11988 - Floodplain Management (42 FR 26951 and Order DOT 5650.2 - Floodplain Management and Protection (dated April 23, 1979)
- Executive Order 11990 - Protection of Wetlands (42 FR 26961) and Order DOT 5660.1A - Preservation of the Nation's Wetlands (dated August 24, 1978)
- Executive Order 12372 - Intergovernmental Review of Federal Programs (dated July 14, 1982)
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (dated February 11, 1994)

2.7.3 *FEDERAL REGULATIONS*

- 7 CFR Part 657 - Prime and unique farmlands
- 15 CFR Part 930 - Federal consistency with approved Coastal Management Programs, and specifically Subpart D - Consistency for activities requiring a federal license or permit
- 36 CFR Part 59 - Land and Water Conservation Fund Program of assistance to states; post-completion compliance responsibilities
- 36 CFR Part 800 - Protection of historic places
- 40 CFR Part 51, Subpart T - Transportation conformity
- 40 CFR Part 93, Subpart B - Determining conformity of general federal action to state or Federal implementation plans
- 40 CFR Parts 1500-1508 - CEQ implementation of NEPA procedural provisions establishes uniform procedures, terminology, and standards for implementing the procedural requirements of NEPA's section 102(2)
- 49 CFR Part 17 Intergovernmental Review of DOT Programs and Activities
- 49 CFR Part 18 - Uniform administrative requirements for grants and cooperative agreements to state and local governments
- 49 CFR Part 24 - Uniform relocation assistance and real property acquisition for Federal and Federally-assisted programs
- 50 CFR Part 17, Subpart B - Endangered and threatened wildlife; endangered and threatened plants

2.7.4 *FAA ORDERS, FEDERAL AVIATION REGULATIONS, AND ADVISORY CIRCULARS*

- FAA Order 5050.4A: Airport Environmental Handbook
- FAA Order 1050.1E: Environmental Impacts: Policies and Procedures
- Federal Aviation Regulations (FAR) Part 77: Objects Affecting Navigable Airspace
- FAR Part 139: Airport Operations Specifications
- FAR Part 150: Airport Noise Compatibility Program
- FAA Advisory Circular (AC) 150/536

Chapter 3.0
Affected Environment

CHAPTER 3.0
AFFECTED ENVIRONMENT

INTRODUCTION

This section provides a description of the current human, physical, and natural environment within the Phoenix Sky Harbor International Airport (PHX) study areas established for this Final Environmental Impact Statement (FEIS). The environmental impacts of the alternatives retained for detailed analyses are presented in **Chapter 4.0**, Environmental Consequences.

FEIS STUDY AREAS

For the purposes of describing the existing conditions in the PHX area and comparing the relative impact of the alternatives (**Chapter 2.0**), four study areas were developed for this FEIS: a Generalized Study Area (GSA), a Detailed Study Area (DSA), an Area of Disturbance (AOD), and a Socioeconomic Study Area (SSA). These four study areas were established based on the development of reasonable alternatives and prior environmental experience to encompass an area allowing for the evaluation of all possible impacts associated with the proposed actions.

For environmental considerations in this FEIS dealing with broad impact issues, a GSA was used to describe features and quantify impact potential. The GSA includes a large geographic area and was established to quantify direct impacts that may occur in the surrounding communities, such as impacts to noise-sensitive land uses, Section 4(f), 6(f), and 106 resources, and direct social and environmental justice impacts. The GSA, shown in **Figure 3-1**, encompasses approximately 19,080 acres and includes portions of Maricopa County, the City of Phoenix, the City of Scottsdale, and the City of Tempe. The GSA boundaries were established based on the estimated extent of the future (2015) Day-Night Average Sound Level (DNL) 65 dBA noise contours (see **Section 4.14**).

A DSA was similarly established for environmental considerations dealing with more specific, direct impact issues such as wetlands, floodplains, biotic communities, and hazardous materials. The DSA covers approximately 3,564 acres and includes the airport property representing the areas where direct disturbance of area features could potentially occur. The DSA is depicted in **Figure 3-2**.

In addition to the DSA, an Area of Disturbance was developed to encompass potential ground-disturbing activities and demolition related to historic or archaeological resources further analyzed in **Chapter 4.0**, Environmental Consequences. This area covers approximately 450 acres and is defined as the Area of Disturbance for archaeological resources, traditional cultural places, and historical buildings and structures. The Area of Disturbance is also shown on **Figure 3-2**.

For the socioeconomic impact analysis, an additional study area referred to as the regional "Socioeconomic Study Area" was established. The SSA is more extensive than the GSA to account for indirect economic effects related to existing activities and conditions at the airport. The degree of linkage among the economies of the communities and the actions that are the subject of this FEIS are also important in defining the study area. The GSA primarily falls within the jurisdictions of Phoenix and

Tempe, with small parcels of Maricopa County and Scottsdale also represented. Thus, while the primary emphasis of the analysis is on these areas and the predominant social and economic linkage is attributed to the cities of Phoenix and Tempe (and to the City of Scottsdale and Maricopa County to a lesser extent), the regional SSA also includes the Phoenix-Mesa Metropolitan Statistical Area (MSA) (see Figure 3-3).

3.1 NOISE

This section describes several aircraft noise terms that will be used throughout this FEIS, the commonly accepted effects of aircraft noise on individuals and communities, the existing (2001) noise condition in the study area, and the noise/land use compatibility guidelines table currently used by many Federal agencies, including the FAA, when addressing aircraft noise and land use compatibility issues. See Section 4.14 for noise impacts associated with the No-Action and proposed project alternative.

3.1.1 AIRCRAFT NOISE TERMINOLOGY

A variety of noise metrics are used to assess airport noise impacts in different ways. Noise metrics are used to describe individual noise events (such as a single operation of an aircraft taking off overhead), groups of events (such as the cumulative effect of numerous aircraft operations), or the collection of which creates a general noise environment or overall exposure level. Both types of metrics are helpful in explaining how people tend to respond to a given noise condition.

The most common single-event metric used to describe aircraft noise exposure is the Sound Exposure Level (SEL), which accounts for both the magnitude and frequency content (pitch) of a noise event, as well as its duration. The cumulative noise metric used to describe PHX's noise environment is the Day-Night Average Sound Level (DNL or technically noted as "L_{dn}"), the FAA-required metric. Descriptions of these and other metrics are provided in Appendix B-2.

Day-Night Average Sound Level - The DNL represents noise as it occurs over a 24-hour period. It is the same as a 24-hour equivalent sound level (Leq), with one important exception: DNL treats nighttime noise differently from daytime noise. The equivalent sound level is the logarithm of the average value of the sound exposure during a stated time period. It is often used to describe sounds with respect to their potential for interfering with human activity. In calculating DNL, it is assumed that the A-weighted levels occurring at night (10:00 p.m. to 7:00 a.m.) are 10 dB louder than they really are. This penalty is applied to account for greater sensitivity to nighttime noise and because events at night are often perceived to be more intrusive.

Values of DNL can be measured with standard monitoring equipment or predicted with computer models. Most aircraft noise studies utilize computer-generated estimates of DNL, determined by accounting for all of the SELs from individual events, which comprise the total noise level at a given location on the ground. Specific point analysis provides a visual basis for comparing noise levels at different sites.

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Generalized Study Area

E MCDOWELL RD
E VAN BUREN ST
E WASHINGTON ST
E BUCKEYE RD
SKY HARBOR BLVD
Salt River
E UNIVERSITY DR
E BROADWAY RD
S 19TH AVE
S 7TH AVE
S CENTRAL AVE
S 7TH ST
S 16TH ST
S 24TH ST
S 32ND ST
S 40TH ST
S 48TH ST
S MILL AVE
S PRIEST DR
S RURAL RD
S MCCLINTOCK DR
PHOENIX
TEMPE
SCOTTSDALE
PAPAGO
TEMPE Golf Course
SOUTH MOUNTAIN COMMUNITY COLLEGE
The Legacy Golf Resort
The Raven Golf Course at South Mountain

LEGEND

- Generalized Study Area
- Airport Property Boundary
- City Boundaries
- Water Features

N W E S

2000 0 2000 Feet

Scale: 1" = 4000'

Sources:
-©2002 Wide World of Maps, Inc.
(Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

FIGURE 3-1

E VAN BUREN ST

E WASHINGTON ST

SKY HARBOR BLVD

E BROADWAY RD

E UNIVERSITY DR

Salt River

Sources:
-©2002 Wide World of Maps, Inc.
(Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-URS Corporation

LEGEND

- Detailed Study Area
- Area of Disturbance
- Airport Property Boundary
- City Boundaries
- Water Features

N W E S

1000 0 1000 Feet

Scale: 1" = 2000'

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Detailed Study Area and Area of Disturbance

FIGURE 3-2

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

SOCIOECONOMIC STUDY AREA

FIGURE 3-3

c1 516//g:\c1 375-GIS Data 2\IG\Phoenix els\Applications\phx els 2.apr [Figure 3-3, Socioeconomic Study Area].npl lav 01/29/04

3.1.2 2001 DNL NOISE EXPOSURE

Noise exposure, methodology, and assumptions are contained in **Appendix B-1** of this EIS.

DNL Contours - Runway use statistics, concerning which aircraft landed or departed a particular runway, were collected and summarized for 2001. A sample of five days of aircraft operational data for each month, based on actual observations from the Terminal Area Management Information System (TAMIS) data, was evaluated to identify runway utilization. The TAMIS data listed the runway used for each aircraft operation.

Table 3.1.2-1 provides the runway utilization for air carriers, cargo, general aviation, and military aircraft operations by aircraft category and day/night. In addition, **Figure 3.1.2-1** indicated overall runway use in east/west flow and by day/night.

During the months of January through April of 2001, Runway 8/26 (north runway) was reconstructed in concrete and utilization of the runway was limited during nighttime hours (between 10:00 p.m. and 7:00 a.m.). The runway reconstruction was completed on May 5, 2001. As a result, the runway utilization for the study year 2001 does not represent the typical aircraft operational environment at PHX. **Figure 3.1.2-1** illustrates percentages for East and West flow for each runway during daytime and nighttime periods from January 1, 2001 through December 31, 2001.

To normalize runway utilization and develop noise contours representing typical aircraft operations, aircraft operational data from June 1, 2001 to May 31, 2002 were collected and analyzed. During this period, the airport operated under typical conditions. It was assumed that the runway utilization during this period would represent typical and normal aircraft operations at PHX. **Figure 3.1.2-2** illustrates percentages for East and West flow for each runway during daytime and nighttime periods from June 1, 2001 through May 31, 2002.

Noise exposure levels resulting from 2001 existing and normalized conditions are depicted as DNL contours in **Figures 3.1.3-1** and **3.1.3-2**. The figures depict noise exposure contours of DNL 65 dB, 70 dB, and 75 dB. DNL contours are a graphical representation of how the noise from PHX's aircraft operations is distributed over the surrounding area on an average day of a given year.

Affected Population - The FAA defines DNL 65 dB as the threshold of noise compatibility with residential land uses. Thus, the DNL 65 dB contour is important for population impact assessments. **Tables 3.1.3-1** and **3.1.3-2** identify land use distribution, population, and number of households within the DNL 65 dB contour for existing and normalized conditions. A Geographic Information System (GIS) was used to identify land use distribution. The data used to calculate impacted population and households were obtained from U.S. Bureau of the Census, Census 2000 TIGER/Line Data, Block Level STF1 Demographic Data.

TABLE 3.1.2-1
2001 EXISTING CONDITION RUNWAY UTILIZATION SUMMARY

Air Carrier

	Arrival						Departure					
	Jet		Prop		Turboprop		Jet		Prop		Turboprop	
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
7L	5%	19%	0%	0%	1%	5%	47%	52%	5%	40%	18%	31%
25R	9%	30%	0%	0%	4%	1%	48%	30%	0%	0%	23%	45%
7R	18%	15%	34%	0%	10%	14%	1%	2%	53%	60%	2%	2%
25L	15%	8%	26%	0%	9%	3%	0%	1%	0%	0%	0%	0%
8	25%	15%	23%	0%	40%	67%	2%	7%	32%	0%	27%	12%
26	28%	13%	17%	0%	35%	9%	3%	9%	11%	0%	30%	11%
Total	100%	100%	100%	0%	100%	100%	100%	100%	100%	100%	100%	100%

Cargo

	Arrival						Departure					
	Jet		Prop		Turboprop		Jet		Prop		Turboprop	
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
7L	7%	40%	3%	4%	1%	72%	33%	49%	23%	46%	29%	30%
25R	19%	30%	9%	8%	5%	4%	45%	26%	3%	6%	24%	11%
7R	26%	21%	16%	20%	14%	14%	11%	17%	39%	16%	17%	44%
25L	37%	8%	39%	20%	43%	1%	9%	6%	13%	3%	5%	8%
8	3%	1%	9%	28%	13%	8%	0%	0%	15%	26%	10%	1%
26	7%	1%	24%	20%	23%	1%	2%	2%	7%	4%	15%	4%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

General Aviation

	Arrival						Departure					
	Jet		Prop		Turboprop		Jet		Prop		Turboprop	
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
7L	2%	18%	3%	17%	1%	12%	22%	27%	14%	40%	11%	25%
25R	4%	15%	6%	26%	3%	25%	25%	20%	14%	11%	8%	10%
7R	20%	24%	22%	24%	18%	11%	13%	14%	16%	23%	16%	27%
25L	18%	16%	25%	15%	20%	6%	11%	12%	18%	9%	14%	6%
8	26%	12%	20%	10%	25%	20%	20%	16%	23%	13%	23%	22%
26	30%	17%	23%	8%	32%	26%	9%	11%	16%	3%	28%	10%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Military

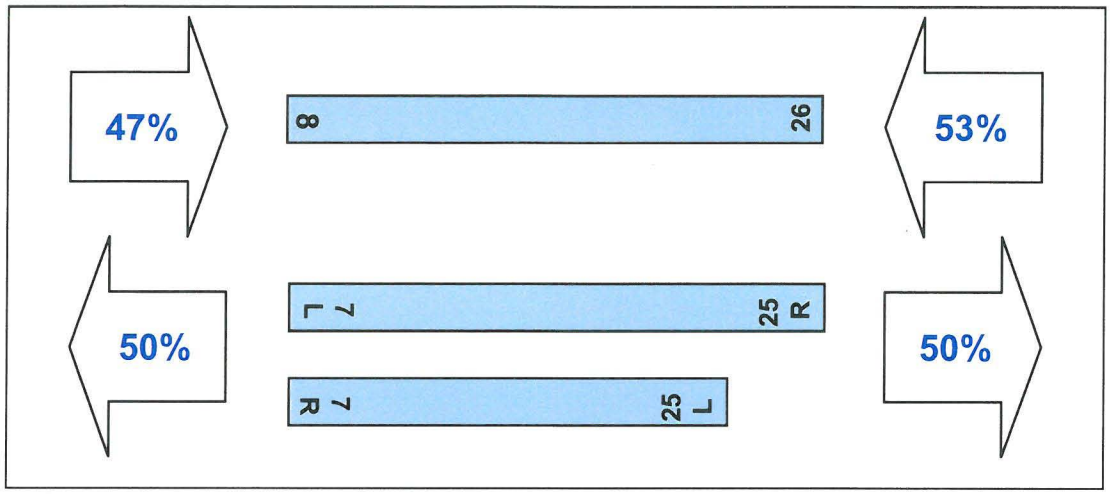
	Arrival						Departure					
	Jet		Prop		Turboprop		Jet		Prop		Turboprop	
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
7L	11%	0%	0%	0%	0%	0%	36%	100%	0%	0%	15%	0%
25R	7%	0%	0%	0%	0%	0%	40%	0%	50%	0%	25%	0%
7R	34%	100%	0%	0%	10%	0%	13%	0%	0%	0%	10%	0%
25L	36%	0%	0%	0%	5%	0%	4%	0%	0%	0%	0%	0%
8	4%	0%	0%	0%	35%	0%	6%	0%	50%	0%	45%	50%
26	9%	0%	100%	0%	50%	0%	2%	0%	0%	0%	5%	50%
Total	100%	100%	100%	0%	100%	0%	100%	100%	100%	0%	100%	100%

Sources: Phoenix Sky Harbor International Airport, 2001; URS Corporation, 2003.

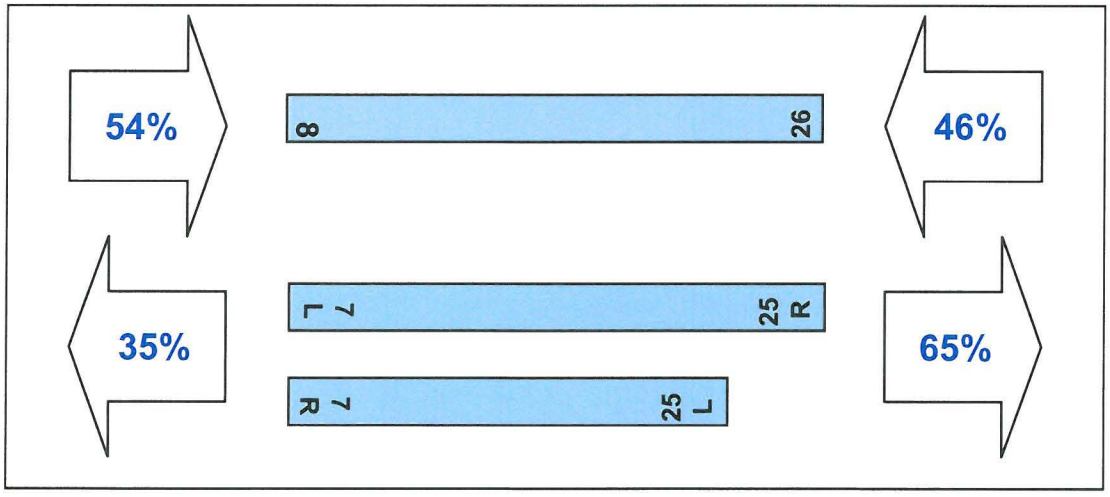
FIGURE 3.1.2-1

2001 Existing Condition East/West Flow Percentages
Phoenix Sky Harbor International Airport
Environmental Impact Statement

Daytime



Nighttime



Notes: 1. % Utilization of all aircraft types from TAMIS data recorded in CY2001.
2. % rounded to nearest number.
3. Daytime = 7AM – 10 PM, Nighttime = 10PM – 7AM

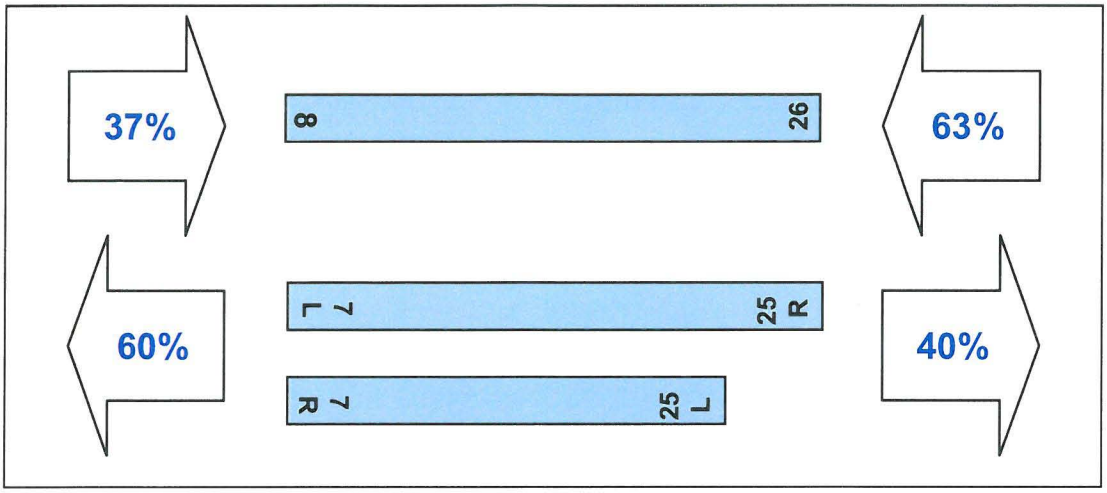
Arrival percentages add up to 100%.
Departure percentages add up to 100%.

Source: Phoenix Sky Harbor International Airport, 2001.

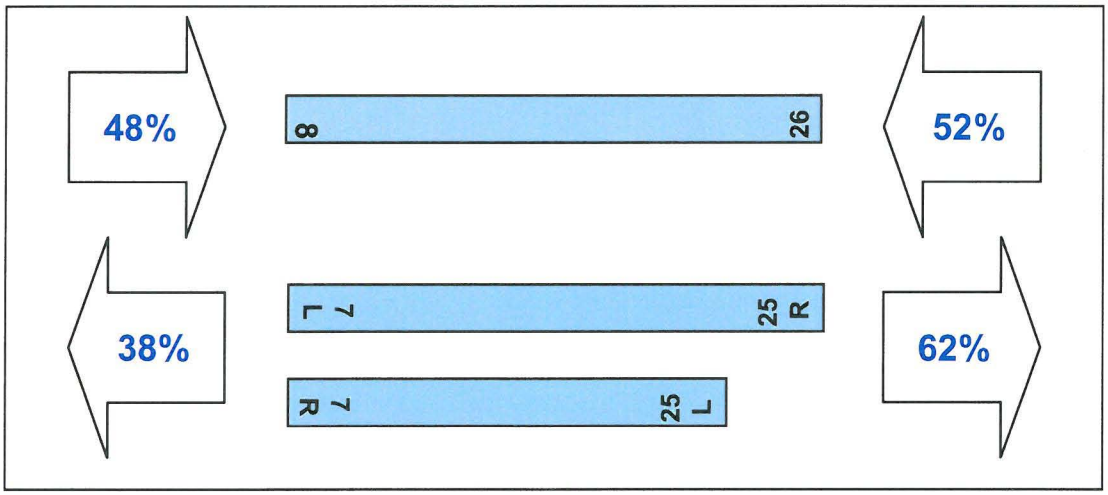
FIGURE 3.1.2-2

2001 Normalized Condition East/West Flow Percentages
Phoenix Sky Harbor International Airport
Environmental Impact Statement

Daytime



Nighttime



Notes: 1. % Utilization of all aircraft types from TAMIS data recorded in CY2001.
2. % rounded to nearest number.
3. Daytime = 7AM – 10 PM, Nighttime = 10PM – 7AM

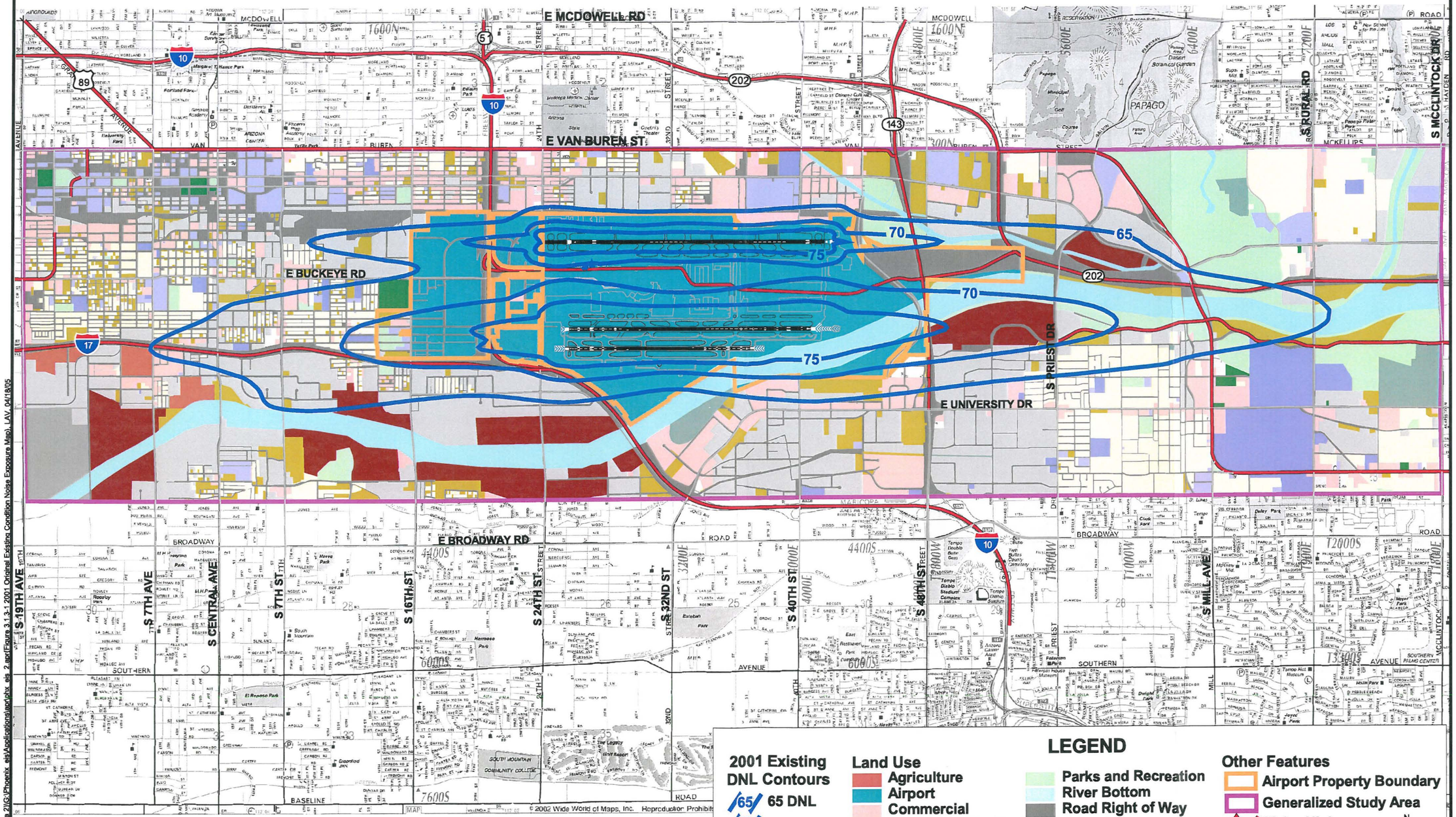
Arrival percentages add up to 100%.
Departure percentages add up to 100%.

Source: Phoenix Sky Harbor International Airport, 2001.

Phoenix Sky Harbor
INTERNATIONAL AIRPORT

Environmental Impact Statement

2001 Existing Condition Noise Exposure Map



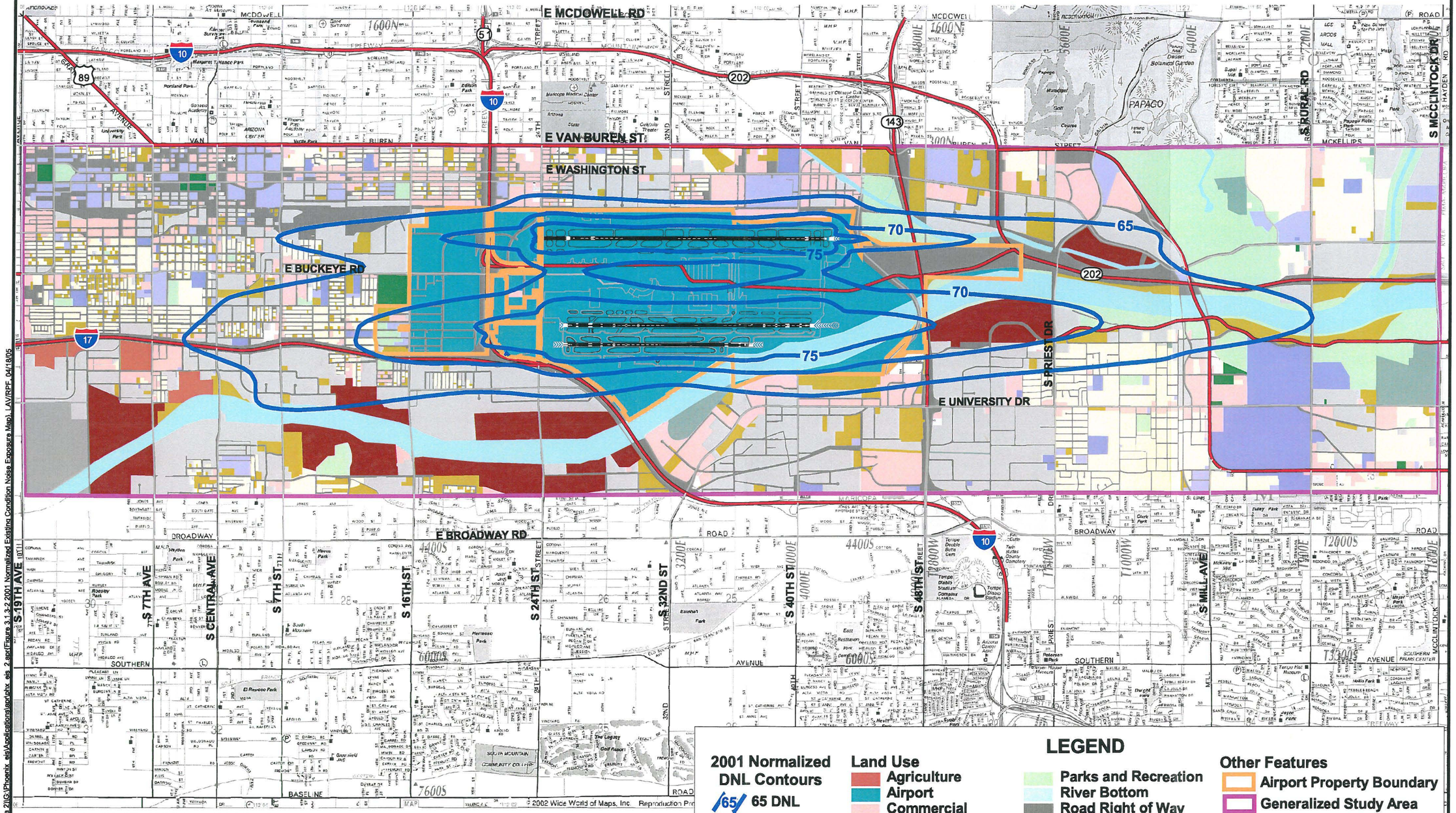
Sources:
-©2002 Wide World of Maps, Inc.
(Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

FIGURE 3.1.3-1

Phoenix Sky Harbor
INTERNATIONAL AIRPORT

Environmental Impact Statement

2001 Normalized Condition Noise Exposure Map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Tempe Diablo Stadium
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The Legend
Golf Resort
South Mountain Community College
Hermoso Park
Encanto Park
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Hayden Park
Steele Indian School Park
Tempe Town Lake
Tempe Beach Park
Papago Park
Tempe Butte Cem
Tempe Double Butte Cemetery
Marcopa Medical Center
Arizona Historical Society
Arizona Capitol Museum
Phoenix Fire Station Four
Phoenix Auction Yard
Phoenix Police Station
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There are 9 hotels located within the DNL 65 dBA noise contour for the 2001 existing or normalized condition. Their location, number of rooms, average occupancy rates, and DNL levels are shown on **Table 3.1.3-3**. Hotels are commonly considered as commercial land use. However, for the purpose of determining land use compatibility, they are considered transient lodging, which is a type of residential land use. FAR Part 150 land use guidelines indicate transient lodging is not compatible at or above DNL 65 dBA.

Specific Point Analysis Locations - Federal guidance concerning noise exposure with regard to land use indicates that noise exposure impacts are significant if there is a 1.5 dB increase in DNL to noise sensitive areas exposed to a DNL of 65 or greater. To determine if noise impacts would be significant, single point DNL noise exposure analysis was conducted for 169 locations within the GSA. These locations are depicted in **Appendix B-2** and include 35 schools, 77 churches, 45 parks, 2 hospitals, and 10 hotels.

A detailed listing of the existing 2001 DNL noise exposure levels for each of the 169 noise-sensitive locations is contained in **Appendix B-2**.

3.1.3 LAND USE COMPATIBILITY

The FAA has adopted guidelines regarding the compatibility of land uses with various noise levels measured using the DNL metric. These guidelines are listed in **Table 3.1.3-4**.

TABLE 3.1.3-1
2001 EXISTING CONDITION NOISE EXPOSURE ESTIMATES

Area by Land Use (Acres)	DNL 65 dBA	DNL 70 dBA	DNL 75 dBA	Total
Agriculture	0.1	–	–	0.1
Airport	793.2	905.9	1,073.8	2,772.9
Commercial	145.2	9.8	–	155.0
Community Facility	12.1	11.0	–	23.1
Government	35.8	–	–	35.8
Hotel/Transient Residential	23.9	9.5	–	33.3
Light Industrial	748.9	58.1	–	807.0
Mining/Extractive	93.7	164.1	4.6	262.4
Parks and Recreation	211.5	91.9	1.1	304.5
Residential	260.9	17.1	–	278.0
River	135.8	53.7	0.5	190.0
Road	841.6	211.1	28.3	1,081.0
School	17.2	7.1	–	24.3
Utilities	211.9	9.1	0.4	221.5
Vacant/Undeveloped	204.7	22.6	0.3	227.6
Total	**3736.6**	**1,571.0**	**1,109.0**	**6,416.5**
Contour Area (Square Miles)	**DNL 65 dBA**	**DNL 70 dBA**	**DNL 75 dBA**	**Total**
	5.791	2.341	1.745	9.877
Population	**DNL 65 dBA**	**DNL 70 dBA**	**DNL 75 dBA**	**Total**
	6,438	396	-	6,834
Housing Units	**DNL 65 dBA**	**DNL 70 dBA**	**DNL 75 dBA**	**Total**
	2,269	101	-	2,370

Source: U.S. Bureau of the Census, Census 2000 TIGER/Line Data, Block Level STF1 Demographic Data.

TABLE 3.1.3-2
2001 NORMALIZED CONDITION NOISE EXPOSURE ESTIMATES

Area by Land Use (Acres)	DNL 65 dBA	DNL 70 dBA	DNL 75 dBA	Total
Agriculture	--	--	--	--
Airport	678.2	1,007.0	1,108.4	2,793.6
Commercial	150.0	21.2	--	171.2
Community Facility	24.5	10.5	--	35.0
Government	36.0	--	--	36.0
Hotel/Transient Residential	28.3	6.0	--	34.3
Light Industrial	864.4	51.3	--	915.6
Mining/Extractive	99.5	167.8	0.7	268.0
Parks and Recreation	197.8	82.5	0.4	280.8
Residential	258.3	11.0	--	269.3
River	162.3	36.6	--	198.9
Road	862.8	228.1	23.9	1,114.8
School	21.2	4.4	--	25.6
Utilities	196.2	15.3	0.5	211.9
Vacant/Undeveloped	215.0	16.4	0.2	231.7
Total	**3,794.3**	**1,658.1**	**1,134.2**	**6,586.6**
Contour Area (Square Miles)	**DNL 65 dBA**	**DNL 70 dBA**	**DNL 75 dBA**	**Total**
	5.936	2.443	1.786	10.164
Population	**DNL 65 dBA**	**DNL 70 dBA**	**DNL 75 dBA**	**Total**
	6,441	279	-	6,720
Housing Units	**DNL 65 dBA**	**DNL 70 dBA**	**DNL 75 dBA**	**Total**
	2,193	72	-	2,265

Source: U.S. Bureau of the Census, Census 2000 TIGER/Line Data, Block Level STF1 Demographic Data.

TABLE 3.1.3-3
HOTELS IN AIRPORT VICINITY

Site #	Hotel	Location	Number of Rooms	Average Occupancy Rate	Existing Condition DNL	Normalized Condition DNL
160	Best Western Airport Inn	2425 S. 24th St.	117	60%	69.2	69.1
161	Motel 6	214 S. 24th St.	61	60-70%	64.2	66.0
163	Hilton Phoenix Airport	2435 S. 47th St.	255	70-100%	71.0	70.5
164	Courtyard by Marriott Phoenix Airport	2621 S. 47th St.	145	75-80%	69.3	68.8
165	Sleep Inn Airport	2621 S. 47th St.	105	60%	67.4	66.8
166	Southwest Inn at Eagle Mountain	1601 W. Rio Salado Pkwy	99	51%	70.8	70.5
167	Amerisuites Tempe Airport	1413 W. Rio Salado Pkwy	125	N/A	70.1	69.8
168	E-Z 8 Motels	1820 S. 7th St.	176	N/A	68.2	67.6
169	Pay Less Inn	515 E. Pima St.	N/A	N/A	66.5	66.5

Source: URS Corporation, 2003.

The development of these guidelines was intended to establish a consistent process for estimating noise compatibility and for considering Federal funding for noise compatibility programs implementation. These guidelines also aid those local jurisdictions that have not established land use guidelines with respect to airports and surrounding lands. The Federal Aviation Regulation (FAR) Part 150 land use compatibility guidelines are consistent with land use compatibility guidelines developed by other Federal agencies such as the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Housing and Urban Development (HUD).

It should be noted that the FAR Part 150 land use compatibility guidelines shown in **Table 3.1.3-4** do not constitute a Federal determination that a specific land use is acceptable or unacceptable under Federal, state, or local laws. The responsibility for determining acceptable land use rests with the local authorities through their zoning laws and ordinances.

Land uses within the 2001 Existing and Normalized Condition DNL 65 dBA noise contour include noise-sensitive land uses, such as residential, schools, and churches. Detailed locations of specific points are shown in **Appendix B-2**. **Table 3.1.3-1** and **Table 3.1.3-2** show acreages of land use within the DNL 65, 70, and up to the 75 dBA contour lines. Residential land use and schools are incompatible between the DNL 65 to 75 dBA noise contours unless they achieve outdoor to indoor noise level reduction of at least 25 dB. Churches located within DNL 65 dBA noise contours are generally compatible with measures to achieve outdoor to indoor noise level reduction of 25 dB. Churches within DNL 70 dBA noise contours need to achieve a noise level reduction of 30 dB to be compatible. Parks located within DNL 65 dBA are not considered incompatible. An incompatible land use for parks would occur if the noise level was DNL 75 dBA or greater. There are no parks within DNL 75 dBA noise contour at PHX.

PHX is currently implementing its FAA-approved Part 150 program, and is participating in a voluntary land acquisition program. The City of Phoenix is evaluating the need for and feasibility of soundproofing schools within areas exposed to high aircraft noise levels around PHX in its FAA-approved Part 150 airport noise compatibility program. The Part 150 Study for PHX was approved by the FAA on September 7, 2001.

TABLE 3.1.3-4
FEDERAL AVIATION REGULATION 14 CFR PART 150
LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

	Yearly Day-Night Average Sound Level (DNL)					
	Below 65 Decibels	65-70 Decibels	70-75 Decibels	75-80 Decibels	80-85 Decibels	Over 85 Decibels
Residential						
Residential (Other than mobile homes & transient lodges)	Y	N[1]	N[1]	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodging	Y	N[1]	N[1]	N[1]	N	N
Public Use						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals, Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, Concert Halls	Y	25	30	N	N	N
Governmental Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						
Offices, Business & Professional	Y	Y	25	30	N	N
Wholesale & Retail Building Materials, Hardware & Farm Equipment	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail Trade - General	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communications	Y	Y	25	30	N	N
Manufacturing & Production						
Manufacturing, General	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and Optical	Y	Y	25	30	N	N
Agriculture (Except Livestock) & Forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock Farming & Breeding	Y	Y[6]	Y[7]	N	N	N
Mining & Fishing, Resource Production & Extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor Sports Arenas, Spectator Sports	Y	Y[5]	Y[5]	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Nature Exhibits & Zoos	Y	Y	N	N	N	N
Amusements, Parks, Resorts, Camps	Y	Y	Y	N	N	N
Golf Courses, Riding Stables, Water Recreation	Y	Y	25	30	N	N

TABLE 3.1.3-4 (CONTINUED)
FEDERAL AVIATION REGULATION 14 CFR PART 150
LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

NOTE: The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties remains with the local authorities. FAA determinations under Part 150 are not intended to substitute Federally determined land use for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

KEY TO TABLE:

SLUCM	Standard Land Use Coding Manual.
Y (Yes)	Land Use and related structures are compatible without restrictions.
N (No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) are to be achieved through incorporation of noise attenuation into the design and construction of structure.
25,30, or 35	Land use and related structures are generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated in design and construction of structure.

[1] Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

[2] Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[3] Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[4] Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[5] Land use compatible provided special sound reinforcement systems are installed.

[6] Residential buildings require an NLR of 25 dB.

[7] Residential buildings require an NLR of 30 dB.

[8] Residential buildings not permitted.

Noncompatible land use.

Source: 14 CFR FAR Part 150, Appendix A, Table 1 (28 December 1995).

3.2 LAND USE

3.2.1 GEOGRAPHIC AREA OF ANALYSIS

The following section provides a description of the existing land use, zoning, and local governments in the GSA and DSA. See Section 4.4 for land use impacts of the No-Action Alternative and proposed project.

3.2.2 GENERALIZED STUDY AREA

The GSA is the geographical area surrounding PHX encompassing the existing 65 DNL contour. The DNL metric is a scientifically modeled level of sound that has been shown to be directly linked to a statistical "annoyance level." According to the FAA, locations outside the DNL 65 dBA are considered compatible with land uses that include residential, schools, churches, and outdoor recreational areas. Figure 3.2.1-1 shows land use in the GSA. Table 3.2.1-1 identifies the land use types within the GSA. Land use within the GSA is mixed, with 3,207 acres of airport, 3,503 acres of light industrial, and 1,996 acres of residential to name of few.

TABLE 3.2.1-1
LAND USE WITHIN THE GENERALIZED STUDY AREA

Land Use Classification	Acreage within the GSA	Percentage within the GSA
Agriculture	104.95	0.55%
Airport	3,207.48	16.80%
Commercial	1,431.11	7.50%
Community Facility	507.17	2.66%
Government	78.00	0.41%
Heavy Industrial	195.87	1.03
Hotel/Transient Residential	109.30	0.57%
Light Industrial	3,502.77	18.35
Mining/Extractive	937.39	4.91%
Parks and Recreation	1,223.27	6.41%
Residential	1,995.94	10.45%
River Bottom	718.76	3.76%
Road Right-of-Way	2,919.93	15.29
School	579.09	3.03%
Utilities	607.61	3.18%
Vacant/Undeveloped	974.67	5.10%
Total	19,093.32	100.00%

Source: URS Corporation.

The cities of Phoenix, Scottsdale, and Tempe and Maricopa County share zoning and planning authority over land use within their jurisdictions in the EIS GSA. The zoning regulations and ordinances established in these communities provide guidelines to control land use in the respective jurisdictions.

3.2.3 DETAILED STUDY AREA

Within the DSA, the airport consists of three east-west-oriented runways located on two airfields. The north airfield includes Runway 8/26 and associated taxiways. The south airfield includes Runway 7L/25R, Runway 7R/25L, and associated taxiways. The existing passenger terminals are located between the north and south airfields. The main terminal area consists of Terminals 2, 3, and 4, with Terminal 2, 3 and 4 parking structures. Also located in the midfield area are the FAA offices, including TRACON and ATC Tower; Airport Aviation Department offices; west air cargo complex; Fixed Based Operators (FBOs); maintenance shops for Delta and American Airlines; and the Airport Rescue and Fire Fighting (ARFF) facilities.

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Land Use within the Generalized Study Area

E MCDOWELL RD
E VAN BUREN ST
E WASHINGTON ST
E BUCKEYE RD
E BROADWAY RD
E UNIVERSITY DR
S PRIEST DR
S RURAL RD
Salt River
PHOENIX
TEMPE
SCOTTSDALE
MCKELLIPS
PAPAGO
BROADWAY
SOUTHERN
BASELINE
ROAD
S 19TH AVE
S 7TH AVE
S CENTRAL AVE
S 7TH ST
S 16TH ST
S 24TH ST
S 32ND ST
202
143
153
51
10
17

LEGEND

Land Use
- Agriculture
- Airport
- Commercial
- Community Facility
- Government
- Heavy Industrial
- Light Industrial
- Mining/Extractive
- Parks and Recreation
- River Bottom
- Road Right of Way
- School
- Residential
- Transient Residential
- Utilities
- Vacant/Undeveloped

Other Features
- Generalized Study Area
- Airport Property Boundary
- City Boundaries

Roadways
- Major Highways
- Other Roads

N W E S

2000 0 2000 4000 Feet
Scale: 1" = 4000'

Sources:
-©2002 Wide World of Maps, Inc.
(Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

FIGURE
3.2.1-1

Centrally located off the eastern end of the runways are the maintenance hangars for America West and Southwest Airlines. Centrally off the western runway ends and inside I-10 are the Budget and National rental car complexes and the LSG/Sky Chef airline catering facilities.

Within the DSA, to the south of Runway 7/25, are the Forestry Service offices, additional FBO hangars and offices, the south air cargo complex, the Arizona Air National Guard complex, and the airport surveillance radar facility.

To the west of Runway 8/26 are the locations of the Hertz rental car complex, the Honeywell Industrial Complex, the DynAir fuel terminal and a general aviation complex, including multiple T-hangars, a U.S. Customs facility, the Department of Public Safety Hangar, the offices of the Civil Air Patrol, an Embry-Riddle University facility, the Left Seat Restaurant, and other corporate and executive hangars. Land uses south of Washington Street and north of the PHX property line include commercial, light industrial, and vacant designations. In addition, there are approximately 14 acres of residential land use.

3.3 SOCIAL IMPACTS

3.3.1 COMMUNITY CHARACTERISTICS

Maricopa County - Maricopa County, established in 1871, covers 9,226 square miles, 98 of which are water and the remaining are land area. The 2000 U.S. Census indicates there are 3,072,149 residents, made up of approximately 50 percent female and 50 percent male. Maricopa County is home to more than half of the state's population in cities such as the state capital of Phoenix, Mesa, Glendale, and Scottsdale. It is the fourth most populous county in the United States. The county is governed by an elected five-member Board of County Supervisors. Maricopa County's top three major industries are services, retail trade, and manufacturing.

City of Phoenix - The City of Phoenix, adjacent to PHX on the north, south, and west sides, was incorporated in 1881, and covers approximately 478 square miles. There are 1,321,045 persons in the city, with 51 percent male and 49 percent female. The median age is 30.7. The city has approximately 495,832 households, an average household size of 2.79, and an average family size of 3.39. The City of Phoenix operates under council/manager form of government, with a directly elected mayor. The council consists of nine members, one of which is the mayor.

City of Scottsdale - The City of Scottsdale, located at the northeastern edge of the GSA, was incorporated in 1951, and covers approximately 185 square miles. There are 202,705 persons in the city, with 48 percent male and 52 percent female. The median age is 41. The city has approximately 104,974 households, an average household size of 2.22, and an average family size of 2.79. The City of Scottsdale operates under a council/manager form of government, consisting of a six-member council, plus a directly elected mayor.

City of Tempe - The City of Tempe, located to the east and southeast of PHX, was incorporated in 1894, and covers approximately 40 square miles. There are 158,625 persons in the city, with 52 percent male and 48 percent female. The median age is 28.8. The city has approximately 67,068 households, an average household size of 2.41, and an average family size of 3.05. The City of Tempe operates under a council/manager form of government, consisting of a six-member council, plus a directly elected mayor. See **Section 4.15** for Secondary induced Impacts of the No-Action Alternative and proposed project.

3.3.2 ENVIRONMENTAL JUSTICE

The identification of minority and low-income populations is relevant for this FEIS because Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies include environmental justice as part of its mission by identifying and addressing as appropriate, the potential for disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations, low-income populations, and Native American tribes. Environmental justice refers to the right to a safe and healthy environment for all and the conditions in which such a right can be freely exercised regardless of race, ethnicity, and socioeconomic status. Environmental justice applies to all environmental resources. This information is to be regarded as a baseline identification of those minority and/or low-income populations that could potentially be adversely affected by the proposed project at PHX.

The comparison population, or the baseline demographic for comparison to be used in the analysis of disproportionate impacts (in the environmental consequences analysis, **Section 4.3**), is defined as the GSA. The GSA encompasses the area where social and environmental justice conditions could potentially be influenced as a result of the proposed project. For purposes of this analysis, minority populations and low-income populations were defined as follows:

- A minority is defined as persons of Hispanic or Latino origin of any race; African Americans, American Indian/Alaska Native; and Asian or Pacific Islanders (without double-counting persons of Hispanic/Latino origin who are also contained in the racial categories).
- Minority populations are identified where either: (a) the minority population of the affected area exceeds 50 percent, or (b) the minority population percentages of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ, 1997).
- Low-income populations are defined as areas where a greater percentage of persons are living below the poverty level than in the comparison population. As discussed in **Table 3.3.2-1**, the U.S. Census Bureau uses a set of 48 money income thresholds to define a "poverty line" or "poverty level." For a family of four, the poverty line in 2000 was $17,463 (U.S. Census Bureau, 2002c and 2001e).

Minority Populations - In 2000, 72,992 persons within the GSA reported racial or ethnic origin. Of these, 43,152 (59.1 percent) were minorities. As shown in **Table 3.3.2-2**, those of Hispanic or Latino ethnicity were most predominant, accounting for 43.0 percent of the population (of all races).

Low-Income Populations - Among the 24 census tracts in the GSA, 37.6 percent of all individuals were living below the poverty line in 1999. As identified in **Table 3.3.2-3**, the following 13 census tracts in the GSA have a greater poverty rate: 1139, 1140, 1141, 1142, 1143.01, 1143.02, 1148, 1149, 1151, 1152, 3187, 3191.01, and 3191.02.

Salt River Pima-Maricopa Indian Community - Although not located within the GSA, the Salt River Pima-Maricopa Indian Community is noted here in keeping with the Council of Environmental Quality's (CEQ) implementing guidance for EO 12898 with regard to Federally recognized Indian Tribes because: 1) it is located adjacent to the eastern portion of the GSA, and 2) the area is both minority and low-income based on the definitions being used in this FEIS. The population of the reservation per the 2000 Census was 6,405. The population was 62.5 percent minority, with 52.6 percent of the population identified as American Indian/Alaska Native. In 1999, 30.5 percent of the population was below the poverty line. Of children younger than 18 years, 37.5 percent were below the poverty line (U.S. Census Bureau, 2000a).

TABLE 3.3.2-1
INCOME AND POVERTY BASED ON CENSUS 2000 DATA

	United States	Arizona	Socioeconomic Study Area				
			Phoenix Mesa MSA	Maricopa County	Phoenix	Scottsdale	Tempe
Per Capita Personal Income 1999[a]	$21,587	$20,275	$21,907	$22,251	$19,833	$39,158	$22,406
Median Household Income in 1999[b]	$41,994	$40,558	$44,752	$45,358	$41,207	$57,484	$42,361
Number of Persons Below Poverty Level[c]	33,899,812	698,669	383,484	355,668	205,320	11,650	21,904
Percent of Persons Below Poverty Level	12.4	13.9	12.0	11.7	15.8	5.8	14.3
Children Below the Poverty Level (>18 years)	11,386,031	249,327	134,899	123,779	77,445	2,074	4,096

[a] Personal income consists of all income that is received by individuals in a given year, originating from all sources. It is calculated as the sum of wage and salary disbursements, other labor income, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and transfer payments to persons, less personal contributions for social insurance. Per capita personal income represents the personal income of the residents of a particular area divided by the population of that area as of July 1 for the reference year (U.S. Bureau of Economic Analysis, 2002i).

[b] Household income is the sum of money income received in the previous calendar year by all household members 15 years and older, including household members not related to the householder, people living alone, and others in non-family households (U.S. Census Bureau, 2002h). The median household income, therefore, is the amount which divides the income distribution into two equal groups, half having income above that amount, and half having income below that amount (U.S. Census Bureau, 2002i).

[c] The U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is poor. If a family's total income is less than that family's threshold, then that family, and every individual in it, is considered poor. A summary of the 48 thresholds provides a general sense of the "poverty line" or "poverty level," but is not used to compute poverty data. The poverty thresholds do not vary geographically, but they are updated annually for inflation with the Consumer Price Index. Based on this information, the poverty level for a family of four in 2000 having two children under the age of 18 was $17,463 (U.S. Census Bureau, 2002f).

Source: U.S. Census Bureau, 2000a, 2002j, 2002k.

TABLE 3.3.2-2
RACIAL COMPOSITION FOR THE REGIONAL AND GENERALIZED STUDY AREAS

Geographic Area	White		Black or African American		American Indian and Alaska Native		Asian, Native Hawaiian, and Other Pacific Islander		Some Other Race		Hispanic or Latino (of Any Race)*	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
United States	211,460,626	75.1	34,658,190	12.3	2,475,956	0.9	10,641,633	3.7	15,359,073	5.5	35,305,818	12.5
Arizona	3,873,611	75.5	158,873	3.1	255,879	5.0	98,969	1.9	596,774	11.6	1,295,617	25.3
Socioeconomic Study Area - 2000												
Phoenix-Mesa MSA	2,502,918	77.0	119,509	3.7	70,740	2.2	72,083	2.2	392,362	12.1	817,012	25.1
Maricopa County	2,376,359	77.4	114,551	3.7	56,706	1.8	70,851	2.3	364,213	11.9	763,341	24.8
Phoenix	938,853	71.1	67,416	5.1	26,696	2.0	28,215	2.1	216,589	16.4	449,972	34.1
Scottsdale	186,883	92.2	2,501	1.2	1,240	0.6	4,131	2.1	4,603	2.3	14,111	7.0
Tempe	122,952	77.5	5,801	3.7	3,186	2.0	7,986	5.0	13,464	8.5	28,473	17.9
Generalized Study Area By Census Tract - 2000												
1138	1,177	49.0	77	3.2	93	3.9	6	0.2	910	37.9	1,601	66.6
1139	741	53.5	215	15.5	19	1.4	0	0	383	27.6	1,033	74.5
1140	1,447	57.1	398	15.7	87	3.4	38	1.5	535	21.1	1,587	62.6
1141	946	49.6	369	19.3	28	1.5	7	0.4	502	26.3	655	34.3
1142	782	38.7	202	10.0	194	9.6	14	0.7	756	37.4	1,720	85.2
1143. 01	609	45.4	144	10.7	119	8.9	0	0	415	30.9	679	50.6
1143. 02	1,305	45.2	398	13.8	105	3.6	77	2.7	889	30.8	2,148	74.4
1148	1,097	34.1	835	26.0	138	4.3	16	0.5	1,026	31.9	2,113	65.7
1149	1,836	61.3	283	9.5	55	1.8	93	3.1	562	18.8	2,328	77.8
1150	886	28.2	57	1.8	128	4.1	0	0	1,972	62.8	2,954	94.0
1151	103	55.1	0	0	0	0	8	4.3	76	40.6	150	80.2
1152	615	20.4	1,015	33.6	74	2.5	6	0.2	1,146	38.0	1,694	56.1
1153	993	39.9	524	21.0	28	1.1	4	0.2	760	30.5	1,712	68.8
1154	1,627	56.5	8	0.3	8	0.3	0	0	1,125	39.1	2,523	87.6
3184	3,346	75.3	126	2.8	97	2.2	116	2.6	615	13.8	1,399	31.5
3185. 02	1,774	83.0	30	1.4	6	0.3	32	1.5	186	8.7	431	20.2
3186	0	0	0	0	0	0	0	0	0	0	0	0
3187	2,313	84.4	113	4.1	16	0.6	146	5.3	99	3.6	130	4.7
3188	4,209	67.5	307	4.9	205	3.3	341	5.5	914	14.6	1,858	29.8
3189	5,345	79.2	224	3.3	204	3.0	167	2.5	606	9.0	1,341	19.9
3190	3,291	86.1	59	1.5	74	1.9	207	5.4	95	2.5	303	7.9
3191. 01	1,431	45.4	226	7.2	71	2.3	1,051	33.3	245	7.8	450	14.3
3191. 02	6,961	69.0	310	3.1	212	2.1	1,160	11.5	983	9.7	2,199	21.8
3197. 04	902	75.2	41	3.4	61	5.1	44	3.7	112	9.3	406	33.9
Total for 24 Census Tracts	**43,736**	**59.9**	**5,961**	**8.2**	**2,022**	**2.8**	**3,533**	**4.8**	**14,912**	**20.4**	**31,414**	**43.0**

Source: U.S. Census Bureau, 2000a, 2002p, 2002q.

* Note: Race statistics presented in this table will not add to 100 percent for two reasons: 1) a small percentage of the population reported two or more races, and 2) Hispanic or Latino origin statistics represent ethnicity (not race) and include all persons who identify themselves as of Hispanic or Latino origin or decent.

TABLE 3.3.2-3
MINORITY AND LOW-INCOME POPULATIONS WITHIN THE GENERALIZED STUDY AREA

Census Tract	Total Percent Minority[a]	Minority Population >50 Percent	Poverty Rate (among individuals)	Low-income Population >37.6 Percent
1138	73.5	Yes	36.8	No
1139	90.8	Yes	70.3	Yes
1140	80.8	Yes	41.1	Yes
1141	56.7	Yes	39.0	Yes
1142	96.2	Yes	56.0	Yes
1143.01	68.8	Yes	52.8	Yes
1143.02	95.1	Yes	70.1	Yes
1148	93.5	Yes	53.8	Yes
1149	90.0	Yes	55.7	Yes
1150	97.0	Yes	33.6	No
1151	84.5	Yes	38.0	Yes
1152	92.8	Yes	49.1	Yes
1153	92.9	Yes	39.0	Yes
1154	88.3	Yes	33.7	No
3184	38.1	No	22.0	No
3185 02	25.3	No	16.5	No
3186	0	No	0	No
3187	15.6	No	57.0	Yes
3188	46.0	No	24.0	No
3189	29.2	No	15.4	No
3190	17.7	No	15.4	No
3191.01	60.9	Yes	51.4	Yes
3191.02	41.0	No	42.7	Yes
3197 04	49.3	No	10.1	No

[a] The total minority population includes individuals of Hispanic/Latino origin, but those that are also Black/African Americans, American Indian/Alaska Natives, Asians, and Native Hawaiian/Other Pacific Islanders are not included in the total in order to avoid double counting.

Source: U.S. Census Bureau, 2002j and 2002q.

3.4 INDUCED SOCIOECONOMIC IMPACTS

3.4.1 INTRODUCTION

For socioeconomic analysis, the potential area of influence of PHX was defined by the SSA. The SSA, as discussed previously, extends beyond the boundaries of the GSA and includes the Phoenix-Mesa MSA, Maricopa County, and the cities of Phoenix, Scottsdale, and Tempe.

The City of Phoenix, Arizona's capital, is the seventh largest city in the nation and has a diversified economic base, with manufacturing, electronics, tourism, and retail trade leading the city's income production. The City of Scottsdale is characterized by its hospitality industry with visitors from both the tourism and business industries. In addition, banking, insurance and investment, business services, and healthcare services are the pulse of the economy. The City of Tempe's economy includes manufacturing, biotechnology, financial, and business services. Arizona State University, with its main campus located in Tempe, is the fourth largest "Research I" public university in the nation (Arizona Department of Commerce, 2002a). The area is growing rapidly - at three times the national rate. The Greater Phoenix Economic Council estimates that there are 240 new residents to the area every day and a new home constructed every 15 minutes (Greater Phoenix Economic Council, 2000a). See **Section 4.16** for socioeconomic, environmental justice and child health impacts of the No-Action Alternative and proposed project.

The high growth rates in the Phoenix/Maricopa County area are a function of the geographic setting of the community as well as the abundance of employment opportunities and reasonably priced housing. Growth planning and management in the Phoenix area is performed by individual municipalities and the Maricopa Association of Governments. The airport supports this growth through the ability to safely and efficiently meet the aviation needs of the community. The airport, in and of itself, is only a minor contributor to the overall population and economic growth within the GSA.

3.4.2 POPULATION

Maricopa County - Population demographics for Maricopa County and the cities of Phoenix, Scottsdale and Tempe are shown in Table 3.4.2-1. During the census period, the population in Maricopa County totaled approximately 3,072,149 persons. Approximately 47 percent of the county's population resided within the City of Phoenix. The racial composition between Maricopa County and the cities of Phoenix, Scottsdale and Tempe is relatively consistent and distributed as follows: 79.0 percent are white; 3.4 percent are black; 2.7 percent are Asian; 2 percent are American Indian or Alaskan Native; 9.8 percent are another race; and 3.1 percent are two or more races. Other demographic data including the number of households, the average household size, and the average family size are also provided in Table 3.4.2-1.

3.4.3 PUBLIC SERVICES

Education - In Maricopa County, there are 57 school districts, including 35 elementary, 6 high school, 14 unified, and 2 accommodation districts. Within the elementary districts, there are 273 elementary schools and the high school districts have 41 high schools. The unified school districts have 235 elementary schools, 42 high schools, and 24 combined schools. Fourteen schools are located within the two accommodation districts. An additional 160 charter schools are located within Maricopa County (Greater Phoenix Economic Council, 2002c).

Within the GSA, there are 10 public elementary/junior high schools and 4 charter schools. No high schools are located in the GSA. There is one community college campus and one middle school in the area. In addition, nearly all of the Arizona State University Main Campus is located within the GSA. As stated previously, the 1999 Arizona State University student enrollment was 44,215 (Arizona State University, 2002).

Medical Services - Extensive medical care facilities are located in the Maricopa County area. Twenty-seven major hospitals with a total of 6,592 beds are located within the Phoenix-Mesa MSA. Among these, 12 are located in Phoenix, 3 are located in Scottsdale, one is located in Tempe, and the remaining hospitals are situated throughout Maricopa County. Most of the hospitals are privately funded (Arizona Department of Commerce, 2000).

TABLE 3.4.2-1
DEMOGRAPHIC DATA FOR MARICOPA COUNTY AND CITIES OF PHOENIX, SCOTTSDALE, AND TEMPE

Approximate Total Population	Maricopa County 3,072,149		City of Phoenix 1,321,045		City of Scottsdale 202,705		City of Tempe 158,625	
Race	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
White	2,376,359	77.4%	938,853	71.1%	186,883	92.2%	122,952	77.5%
African American	114,551	3.7%	67,416	5.1%	2,501	1.2%	5,801	3.7%
American Indian/Alaskan Native	56,706	1.8%	26,696	2.0%	1,240	0.6%	3,186	2.0%
Asian	66,445	2.2%	26,449	2.0%	3,964	2.0%	7,531	4.7%
Native Hawaiian & Other Pacific Islanders	4,406	0.1%	1,766	0.1%	167	0.1%	455	0.3%
Some Other Race	364,213	11.9%	216,589	16.4%	4,603	2.3%	13,464	8.5%
Two or More Races	89,469	2.9%	43,276	3.3%	3,347	1.7%	5,236	3.3%
Hispanic Heritage*	---	24.8%	---	34.1%	---	7.0%	---	17.9%
*Persons of Hispanic heritage can be of any race.								
Households	**1,250,231**	-	**465,834**	---	**90,669**	---	**63,602**	---
Average Household Size	2.67	---	2.79	---	2.22	---	2.41	---
Average Family Size	3.21	---	3.39	---	2.79	---	3.05	---

Source: U.S. Census Bureau, County and City Data Book: 2000, Tables C-1 and C-2. Census 2000 Summary File 1, Table P12.

3.4.4 EXISTING ECONOMIC IMPACT OF PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

In 2000, 135,152 persons were employed at PHX, representing approximately 6.9 percent of the total employment within the Phoenix-Mesa MSA during that year. Persons employed at the airport can be grouped into the categories of commercial airlines, air cargo firms, terminal businesses, airport services, FBOs, ground transportation, industrial facilities, government services, construction, and City of Phoenix contract employees. In 2000, direct economic impact of activities on and off the airport grounds sustained 40,745 jobs, while the induced economic impact sustained 94,407 jobs. Of the municipalities, persons in Phoenix (10,468), Scottsdale (1,692), and Tempe (2,231) were employed by PHX, respectively (City of Phoenix, 2002a).

In terms of dollars, the direct economic activity on and off airport grounds equaled $6,105,899,000. Induced economic activity, based on the multiplier effects of indirect spending, was $5,876,815,000 which translated into a total economic impact of $11,982,714,000 (City of Phoenix, 2002a).

3.5 AIR QUALITY

This section presents information on existing air quality conditions for the Phoenix metropolitan area, including the area around PHX. As a result of 1) recent revisions in the air quality regulations regarding ozone and particulate matter, 2) recent guidance from FAA with respect to estimating emissions of particulate matter from aircraft engines, and 3) updated information from the Maricopa Association of Governments (MAG) for calculating motor vehicle emission factors, the air quality analysis for the EIS was updated to incorporate the additional information.

Among this material is a brief summary of air monitoring data; an explanation of the current regulatory status with respect to Federal air quality criteria; and a discussion of state, regional, and local efforts to manage air quality in this area of Arizona. This section also identifies and describes the various sources of air emissions at PHX and their pollutants. The potential impact to air quality associated with the proposed alternatives for PHX are analyzed and discussed in **Section 4.2**, Environmental Consequences - Air Quality.

3.5.1 CLIMATE

The climate for the Phoenix area is of a desert type with low annual rainfall (8.3 inches) and low relative humidity. Daytime temperatures are high throughout the summer months and mild in the winter. Nighttime temperatures frequently drop below freezing during the three coldest months, but the afternoons are usually sunny and warm. Sunshine in the Phoenix area averages 86 percent of possible sunshine, ranging from a minimum monthly average of 78 percent in January and December to a maximum of 94 percent in June.

In the desert southwest, many days each summer exceed 110° F in the afternoon and remain above 85° F all night. The normal high temperature is over 90° F from early May through early October, and over 100° F from early June through early September. The average maximum temperature, based on the 1971-2000 normal, is 104.2° F in July.

Arizona has a distinct two-season rainfall pattern (a winter season and a monsoon season). The first occurs during the winter months from December through March when the area is subjected to occasional storms from the Pacific Ocean. The second rainfall period occurs during July and August when Arizona is subjected to widespread thunderstorm activity whose moisture supply originates in the Gulf of Mexico, in the Pacific Ocean off the west coast of Mexico, and in the Gulf of California. The spring and fall months are generally dry, although precipitation in substantial amounts has fallen occasionally during every month of the year.

3.5.2 REGULATORY SUMMARY

The regulation and management of ambient (outdoor) air quality conditions in the Phoenix metropolitan area is shared by a variety of Federal, state, regional, and local agencies. These agencies are identified in Table 3.5.2-1 along with a brief description of their roles and responsibilities in the Phoenix area.

TABLE 3.5.2-1
AGENCIES INVOLVED IN AIR QUALITY MANAGEMENT IN THE PHOENIX AREA

Agency	Air Quality Roles and Responsibilities
U.S. Environmental Protection Agency (EPA)	*Federal Agency* - Sets national policies and standards under the CAA; reviews and approves SIPs. (Phoenix is located in Region 9 of EPA.)
Arizona Department of Environmental Quality (ADEQ)	*State Agency* - Sets state policies, rules, and regulations; compiles SIP-related documents and submits them to EPA for approval; conducts air monitoring.
Maricopa Association of Governments (MAG)	*Regional Agency* - Council of Governments providing assessments for regional issues including air quality and transportation; responsible for SIP and TIP development.
Maricopa County Environmental Services Department - Air Quality Division (AQD)	*Local Agency* - Issues operating permits; monitors ambient air quality; develops and enforces local air quality rules and regulations; prepares periodic emissions inventories under the CAA.

CAA = Clean Air Act
SIP = State Implementation Plan
TIP = Transportation Improvement Plan
Source: URS, 2002.

The EPA sets the guidelines, policies, and standards under the Federal Clean Air Act (CAA) for protecting air quality conditions across the country. On the state level, the Arizona Department of Environmental Quality (ADEQ) Air Division serves to ensure that these guiding principles are met and carried out all over Arizona. The Maricopa Association of Governments (MAG) helps manage air quality conditions throughout the Phoenix metropolitan area with the development of regional air quality and surface transportation plans. The Maricopa County Environmental Services Department - Air Quality Division (AQD) monitors the ambient air, issues permits, and helps enforce compliance with the rules and regulations that are designed to protect air quality in the Phoenix area.

3.5.3 CRITERIA AIR POLLUTANTS

The EPA has established National Ambient Air Quality Standards (NAAQS) for a group of "criteria air pollutants" to protect public health, the environment, and the quality of life from the detrimental effects of

air pollution. These NAAQS have been set for the following six pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur oxides (SO_x). The NAAQS primary standards (designed to protect human health) and secondary standards (designed to protect human welfare) are contained in **Table 3.5.3-1** and are briefly discussed in **Appendix F**.

TABLE 3.5.3-1
NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Times	Standard		Notes
		ppm	$\mu g/m^3$	
Carbon Monoxide (CO)	1 hour	35	40,000	Not to be exceeded more than once a year.
	8 hour	9	10,000	Not to be exceeded more than once a year.
Lead (Pb)	Quarterly	---	1.5	Not to exceed this level
Nitrogen Dioxide (NO_2)	Annual	0.053	100	Not to exceed this level
Ozone (O_3)	1 hour[a]	0.12	235	Number of exceedences over 3 years must be less than or equal to 1.
	8 hour	0.08	157	The average of the annual 4th highest daily 8-hour maximum over a 3-year period is not to exceed this level.
Particulate Matter with a diameter $\leq$ 10 μm (PM_{10})	24 hour	---	150	Not to be exceeded more than once a year.
	Annual	---	50	The annual arithmetic mean at each monitor must not exceed this standard.
Particulate Matter with a diameter $\leq$ 2.5 μm ($PM_{2.5}$)	24 hour	---	65	The 3 year average of the 98th percentile for each population oriented monitor within an area is not to exceed this level.
	Annual	---	15	The 3-year average of the annual arithmetic mean from single or multiple monitors within an area is not to exceed this level.
Sulfur Oxides (SO_x) (measured as SO_2)	3 hour[b]	0.50	1,300	Not to be exceeded more than once a year.
	24 hour	0.14	365	Not to be exceeded more than once a year.
	Annual	0.03	80	Not to exceed this level.

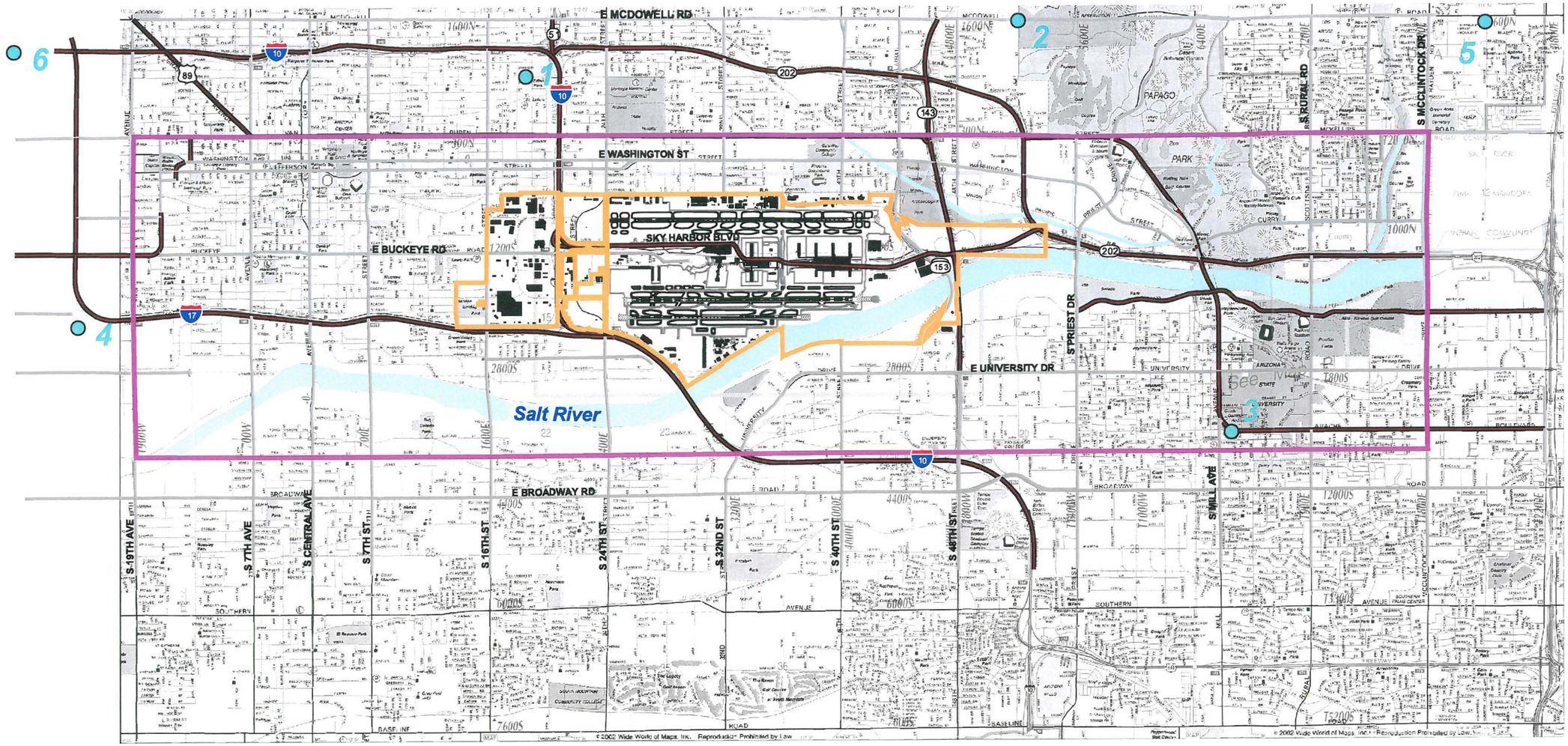
[a] U.S. EPA revoked the 1-hour ozone standard on June 15, 2005.

[b] Secondary standard designed to protect public welfare, where the rest are Primary standards, which protect public health.

ppm = parts per million.
$\mu g/m^3$ = micrograms per cubic meter.
Source: EPA, 2004. (www.epa.gov/air/criteria.html)

3.5.4 AIR MONITORING DATA

The Maricopa County AQD, with assistance from ADEQ, operates ambient air quality monitoring sites scattered throughout the Phoenix metropolitan area as part of their state and local air monitoring programs. Together, these stations are intended to sample and record outdoor levels of the EPA criteria air pollutants discussed above. There are six air monitoring stations located in the general vicinity of PHX. As shown on **Figure 3.5.3-1**, the closest air monitoring station to PHX (Site No. 1) is situated 2.4 miles away to the north-northwest on Roosevelt Street. Five other monitoring sites are located within 6 miles of the airport. No air monitoring stations are located directly on, or adjacent to, PHX.



Air Quality Monitoring Station Locations

ID	Location
1	1845 E Roosevelt St.
2	2035 N 52nd St.
3	1525 S College Ave.
4	3045 S 22nd Ave.
5	2857 N Miller Rd.
6	1128 N 27th Ave.

LEGEND

- Air Quality Monitoring Station

Other Features

- Generalized Study Area
- Airport Property Boundary
- Water Features
- Major Highways
- Other Roads

N, W, E, S

3000 0 3000 Feet

Scale: 1" = 5000'

Sources:
-©2002 Wide World of Maps, Inc.
(Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-U.S. EPA Air Data, 2002
-URS Corporation

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Air Quality Monitoring Stations

FIGURE
3.5.3-1

c1 516\ix\c1 375-GIS Data 2\IG:\Phoenix_eis\Applications\aq\dbx_eis_2.apr(Figure 3.5.3-1. Air Quality Monitoring Stations)..mf, lav.. 12/14/05

Table 3.5.4-1 contains summary information and data from these monitoring sites including the site locations, distance, and direction from PHX, the pollutants measured, and the highest recorded levels in 2001 (the baseline year for this EIS which is the last period after release of the EIS NOI for which a full 12 months of data are available). For comparative purposes, the NAAQS are also provided and an indication as to whether or not the NAAQS are exceeded.

TABLE 3.5.4-1
AIR MONITORING DATA SUMMARY (2001)

Site No.	Location	Distance and Direction (miles) from PHX	Pollutants Measured	Highest Recorded Level	NAAQS	Averaging Time	Exceeds Standards
1	1845 E. Roosevelt St. Phoenix	2.4 NNW	CO	5.8 ppm 4.3 ppm	35 ppm 9 ppm	1-hour 8-hour	No No
			SO_2	0.014 ppm 0.08 ppm 0.002 ppm	0.50 ppm 0.14 ppm 0.03 ppm	3-hour 24-hour annual	No No No
			NO_2	0.027 ppm	0.053 ppm	annual	No
			O_3	0.092 ppm	0.12 ppm	1-hour	No
			PM_{10}	134 ug/m3 40.2 ug/m3	150 ug/m3 50 ug/m3	24-hour annual	No No
2	2035 N. 52nd St. Phoenix	3.3 NNE	O_3	0.074 ppm	0.12 ppm	1-hour	No
3	1525 S. College Ave. Tempe	4.2 ESE	CO	4.3 ppm 2.6 ppm	35 ppm 9 ppm	1-hour 8-hour	No No
			NO_2	0.021 ppm	0.053 ppm	annual	No
			O_3	0.100 ppm	0.12 ppm	1-hour	No
4[1]	3045 S. 22nd Ave. Phoenix	5.2 WSW	PM_{10}	276 ug/m3 89.2 ug/m3	150 ug/m3 50 ug/m3	24-hour annual	Yes Yes
5	2857 N. Miller Rd. Scottsdale	5.8 NE	CO	4.3 ppm 3.2 ppm	35 ppm 9 ppm	1-hour 8-hour	No No
			SO_2	0.008 ppm 0.006 ppm 0.001 ppm	0.50 ppm 0.14 ppm 0.03 ppm	3-hour 24-hour annual	No No No
			NO_2	0.020 ppm	0.053 ppm	annual	No
			O_3	0.102 ppm	0.12 ppm	1-hour	No
			PM_{10}	52 ug/m3	150 ug/m3	24-hour	No
				30.3 ug/m3	50 ug/m3	annual	No
6	1128 N. 27th Ave. Phoenix	6.0 ENE	CO	7.0 ppm 4.7 ppm	35 ppm 9 ppm	1-hour 8-hour	No No
			NO_2	0.036 ppm	0.053 ppm	annual	No
			PM_{10}	90 ug/m3 45.3 ug/m3	150 ug/m3 50 ug/m3	24-hour annual	No No

*NAAQS = National Ambient Air Quality Standards
ug/m^3 = micrograms per cubic meter
ppm = parts per million
CO = carbon monoxide
Source: EPA AIRS database, 2002.
NO_2 = nitrogen dioxide
O_3 = ozone
PM_{10} = particulate matter less than 10 micrometers in diameter
SO_2 = sulfur dioxide

[1] This monitoring site has been removed.

Importantly, the pollutant levels recorded are not necessarily considered representative of the conditions near the airport. Rather, they are reported here as indicators of overall air quality conditions in this part of Phoenix.

Data from the Roosevelt Street site (Site No. 1) show that the highest levels in 2001 (baseline year) were well within the NAAQS for the various pollutants recorded at this station. Ozone is the only pollutant

measured at the North 52nd Street site (Site No. 2), and the highest reading was well below the NAAQS for this pollutant.

The monitoring data from Site Nos. 3 through 6 are also in compliance with the criteria set by the NAAQS, with one exception. Site No. 4, located about 5.2 miles northeast of the airport, recorded exceedances of both the 24-hour and annual mean NAAQS for PM_{10}. Because of the distance between this monitoring station and the airport, these PM_{10} levels are not representative of the area around PHX.

3.5.5 ATTAINMENT/NONATTAINMENT STATUS

Based on air monitoring data and in accordance with the Clean Air Act Amendments (CAAA) of 1977, all areas within the United States are designated with respect to the NAAQS as *attainment*, *nonattainment*, *maintenance,* or *unclassifiable*. An area with air quality better than the NAAQS is designated as attainment; an area with air quality worse than the NAAQS is designated as nonattainment. An area may be designated as unclassifiable when there is a temporary lack of data to form a basis of attainment status. Nonattainment areas are further classified as extreme, severe, serious, moderate, and marginal by the degree of non-compliance with the NAAQS. Finally, areas that are reclassified from nonattainment to attainment are designated as *maintenance*. The current attainment/nonattainment designations for the Phoenix metropolitan area are summarized in Table 3.5.5-1.

TABLE 3.5.5-1
ATTAINMENT/NONATTAINMENT DESIGNATIONS FOR THE PHOENIX AREA

Pollutant	Designation
Carbon monoxide (CO)	Attainment/Maintenance
Nitrogen dioxides (NO_2)	Attainment
Ozone (O_3) (1-hr)*	Maintenance
Ozone (O_3) (8-hr)	Nonattainment (Basic Subpart 1)
Sulfur oxides (SO_x)	Attainment
Particulate matter (PM_{10})	Nonattainment (Serious)
Particulate matter ($PM_{2.5}$)	Attainment
Lead (Pb)	Attainment

* The Phoenix area was designated maintenance for the 1-hour ozone standard on June 14, 2005. EPA revoked the 1-hour ozone standard on June 15, 2005.

Source: EPA, 2004, 2005.

Based on the information contained in Table 3.5.5-1, the entire Phoenix metropolitan area is currently designated as attainment for the criteria pollutants CO, NO_2, SO_x, $PM_{2.5}$, and Pb. Recently, the area met the NAAQS for CO and the 1-hour ozone standard and was redesignated to attainment/maintenance. In contrast, the Phoenix metropolitan area does not meet the NAAQS for PM_{10} and the ozone 8-hour standard. The area is designated as basic nonattainment with respect to the 8-hour O_3 standard and serious nonattainment for PM_{10}.

The geographic limits of the CO and O_3 nonattainment areas share common boundaries, encompassing almost 2,000 square miles, or virtually the entire Phoenix metropolitan area (see **Figure F-2** in **Appendix F**). The PM_{10} nonattainment area is somewhat larger by comparison, extending further into less developed sections of Maricopa County. PHX is located within all three nonattainment areas.

3.5.6 STATE IMPLEMENTATION PLANS

Because portions of the Phoenix area do not or did not meet the NAAQS, a State Implementation Plan (SIP) has been developed which includes plans for these nonattainment areas. The SIP is the cumulative record of all nonattainment area plans and includes air pollution control strategies, emission budgets and timetables implemented or adopted by government agencies within Arizona to bring nonattainment areas into compliance with the NAAQS.

In the SIP, three nonattainment area plans exist for the Phoenix area: one each for the CO, 1-hour O_3, and PM_{10} nonattainment designations. These SIPs are identified in **Table 3.5.6-1** and discussed further below.

TABLE 3.5.6-1
STATE IMPLEMENTATION PLAN SUMMARY

Pollutant	State Implementation Plan	Status	Comments
Carbon monoxide (CO)	Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area, March 2001.	Submitted by MAG to the EPA in March 2001; EPA issued a completeness finding October 2001 and on September 22, 2003, found that the Phoenix area had attained the CO standard [68 FR 550088].	Demonstrates attainment of the NAAQS for CO by December 2000; EPA approved the Maricopa County CO Maintenance Plan effective April 8, 2005 [70 FR 11553].
Particulate Matter (PM_{10})	Revised MAG 1999 Serious Area Particulate Plan for PM_{10} for the Maricopa County Nonattainment Area, February 2000.	Approved by the EPA in January 2002.	Calls for attainment of the PM_{10} standard by an extended deadline of December 2006.
Ozone (O_3)	Final Serious Area Ozone SIP for Maricopa County, 2000. One-hour Ozone Redesignation Plan for the Maricopa County Nonattainment Area, 2004.	ADEQ submitted the plan in December 2000, replacing the Revised Rate of Progress (ROP)/Federal Implementation Plan (FIP). On April 21, 2004, MAG submitted a request for 1-hour O_3 designation. The plan was approved on June 14, 2005.	The area has been redesignated to a Maintenance area. Phoenix has been granted an exemption from the NO_x requirements under Section 182(f) of the CAA for the 1-hour standard plan. Accordingly, the 1-hour SIP primarily addresses volatile organic compounds (VOC) emissions. The 1-hour standard was revoked one year following the effective date of the 8-hour designation on June 15, 2005. An 8-hour ozone SIP is currently being developed by ADEQ.

Source: MAG and EPA, 2002, 2003, 2004, 2005.

Carbon Monoxide - The Revised *MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area* was submitted to the EPA in March, 2001 (MAG, 2001a). This plan showed that Maricopa County was in attainment of the NAAQS for CO by December 2000. The EPA issued a "notice of adequacy" for the revised SIP in October 2001 and on September 22, 2003 found that the Phoenix area had attained the CO standards. EPA approved the plan on March 9, 2005. Importantly, there have been no new violations of the NAAQS for CO in Phoenix over the past 6 years.

In accordance with the CAA, a *1999 Periodic Carbon Monoxide Emission Inventory* was prepared by ADEQ and published in November 2001 (AQD, 2001). Aircraft emissions associated with PHX are included in this inventory based on 1999 operational levels and are given for both the 1999 annual total and typical "CO season" day conditions.

Particulate Matter - Most of Maricopa County and the entire Phoenix metropolitan area (including the area of PHX) is designated as a serious nonattainment area for the pollutant PM_{10}. In February 2000, the *Revised 1999 Serious Area Particulate Plan for PM_{10} for the Maricopa County Nonattainment Area* was submitted to the EPA (MAG, 2000). However, the CAA-mandated attainment date of December 2001 for serious PM_{10} nonattainment areas was deemed impracticable for this area. Therefore, this plan contains a provision to extend the attainment date to December 2006. The EPA approved the 1999 PM SIP plan and the 2006 emissions inventory in January 2002 (*Federal Register*, 2001).

The approved SIP contains an emission inventory for generalized categories of PM_{10} emissions (i.e., motor vehicles, agriculture, construction activities, etc.) but does not specifically identify PM_{10} emissions associated with PHX.

With respect to the $PM_{2.5}$ standards, EPA issued its Final Rule that designates the entire state of Arizona as being in attainment of the $PM_{2.5}$ standards.

Ozone - Prior to 1999, Maricopa County and the Phoenix metropolitan area (including the area around PHX) were subject to *a Revised Rate of Progress (ROP)/Federal Implementation Plan (FIP)* because of the serious ozone nonattainment designation. However, in 2000 the *Final Serious Area Ozone State Implementation Plan for Maricopa County,* developed and submitted by ADEQ, replaced the ROP/FIP (MAG, 2000). Importantly, both the ROP/FIP and the SIP only address reductions in VOCs - one of the precursors to ozone formation. Neither of these plans calls for the additional control of NO_x as an ozone precursor as the EPA has determined that further reductions in NO_x emissions from major stationary sources in Phoenix would not contribute to attainment of the NAAQS for ozone (Federal Register, 1995).

In accordance with the CAA, AQD has prepared a *1999 Periodic Ozone Emissions Inventory* that contains emission estimates for VOCs and NO_x for PHX for 1999.

In 2001, EPA determined that the Phoenix metropolitan serious ozone nonattainment area had attained the NAAQS for 1-hour O_3 by the 1999 deadline (65 FR 3859, May 19, 2000). On April 21, 2004, MAG submitted a 1-hour Ozone redesignation request and an *Ozone Maintenance Plan* for EPA's review and approval. The Plan was approved by the EPA on June 14, 2005 (70 FR 34362).

On April 15, 2004, EPA signed the final area designations for the 8-hour standard. The designations were effective June 15, 2004 (69 FR 23858, April 30, 2004, see the EPA website at: http://www.epa.gov/oar/oaqps/glo/designations/). The Phoenix area is designated as a "basic" nonattainment area covered under title 1, part D, subpart 1 of the CAA. The requirements of subpart 1 allow areas more flexibility in designing and adopting control strategies to reach attainment.

EPA also issued Phase 1 of the final rule for implementing the 8-hour standard (69 FR 23951, April 30, 2004, see the EPA website at: http://www.epa.gov/oar/oaqps/glo/designations/). The rule addresses 8-hour implementation program requirements including revocation of the 1-hour ozone standard, anti-backsliding provisions to maintain air quality improvements made during implementation of the 1-hour standard, and attainment dates. EPA's rule for implementing the new standard requires that the Phoenix nonattainment area meet the standard by 2009. As part of the next steps in the implementation process, state and local agencies will work to develop a program to bring the area into attainment. The Phoenix 8-hour nonattainment area SIP including any required control strategies must be submitted to EPA in 2007.

3.5.7 TRANSPORTATION IMPROVEMENT PROGRAM

Another requirement for nonattainment areas under the CAA is the formal demonstration that the surface transportation networks (including the roadway and transit systems) conform to the goals and objectives of the appropriate SIP. In the Phoenix area, MAG is again the agency responsible for making this demonstration.

To meet this requirement, MAG developed a *Transportation Conformity Analysis for the Fiscal Year (FY) 2003 – 2007 Transportation Improvement Program (TIP) and the Long Range Transportation Plan (TP) 2002 Update (MAG).* Based on the latest population, employment, and traffic assumptions and using computer modeling of traffic and air quality conditions, MAG has demonstrated that both the TIP and the TP for the Phoenix metropolitan area conform to the SIPs for CO, O_3, and PM_{10}.

3.5.8 SOURCES OF AIRPORT AIR EMISSIONS

Almost all large metropolitan airports (including PHX) experience air emissions from the following general source categories: aircraft, ground service equipment (GSE) and motor vehicles traveling to, from, and moving about the airport site; fuel storage and transfer facilities; a variety of stationary sources (i.e., steam boilers, back-up generators, refuse incinerators, etc.); an assortment of aircraft maintenance activities (i.e., painting, cleaning and repair); routine airfield, roadway and building maintenance activities (i.e., cleaning, painting and repair); and periodic construction activities for new projects or improvements to existing facilities. **Table 3.5.8-1** provides a summary listing of these sources of air emissions, the pollutants, and their characteristics.

TABLE 3.5.8-1
AIRPORT-RELATED SOURCES OF AIR EMISSIONS

Sources	Emissions	Characteristics
Aircraft	• CO • HC • NO_x • PM_{10} • $PM_{2.5}$ • SO_2	Exhaust products of fuel combustion that vary greatly depending on aircraft engine type, power setting, and period of operation. Except for short periods of takeoff and approach, aircraft altitude precludes measurable offsite ground-level impacts.
Motor vehicles	• CO • HC • NO_x • PM_{10} • $PM_{2.5}$ • SO_2	Exhaust products of fuel combustion from patron and employee traffic approaching, departing, and moving about the airport site. Emissions vary greatly depending on vehicle type, distance traveled, operating speed, and ambient conditions.
Ground service vehicles	• CO • HC • NO_x • PM_{10} • $PM_{2.5}$ • SO_2	Exhaust products of fuel combustion from service trucks, tow tugs, belt loaders, and other portable equipment.
Fuel storage and transfer facilities	• HC	Formed from the evaporation and vapor displacement of fuel from storage tanks and fuel transfer facilities. Emissions vary with fuel usage, type of storage tank, refueling method, fuel type, vapor recovery, climate, and ambient temperature.
Stationary source facilities	• CO • HC • NO_x • PM_{10} • $PM_{2.5}$ • SO_2	Exhaust products of fossil fuel combustion from boilers dedicated to indoor heating requirements. Emissions are generally well controlled with operational techniques. Sources include boilers, emergency generators and a fire-training facility.
Construction activities	• CO • HC • NO_x • PM_{10} • $PM_{2.5}$ • SO_2	Roadway and airport construction projects may have associated emissions from excavation and land clearing, construction equipment, asphalt, and motor vehicles. Dust (e.g., soil and concrete) generated during construction and land-clearing activities released into the air by wind and machinery. The amount of particulate emissions varies with the material type, the amount of area exposed, and meteorology. The construction of airport and airfield improvement projects at airports represents temporary sources of emissions primarily associated with the exhaust from construction equipment and evaporative VOCs from asphalt paving operations.

Source: URS 2002.
Notes: Although there are no NAAQS for HC, they are also included in this analysis as they are considered to be one of the precursors to the formation of ozone. VOCs are a subset to HC.
Hydrocarbon (HC) - Hydrocarbon pollution results when unburned or partially burned fuel is emitted from the engine as exhaust, and also when fuel evaporates directly into the atmosphere.

As discussed above, the amounts of emissions associated with PHX have been quantified by MAG as part of the SIP development and approval process. The basis for this information is the *Aviation Air Quality Study* prepared in 1996 (Lee Engineering, 1996). The ADEQ has also included PHX emissions

as part of its Periodic Air Emissions Inventories for CO and O_3. An emissions inventory of PHX was also prepared as part of the Sky Harbor Master Plan Update Improvements FEIS (FAA, 1993).

These emission inventories have been updated as part of the air quality impact analysis contained in **Section 4.2**, Environmental Consequences - Air Quality, of this FEIS. This was accomplished using up-to-date operational forecasts for PHX and the most recent versions of the appropriate FAA and EPA models.

3.5.9 2001 EMISSION INVENTORY

An air emissions inventory of existing conditions (2001) was conducted for PHX following FAA and EPA guidelines and using the Emissions and Dispersion Modeling System (EDMS, version 4.12). In March 2001, the FAA issued a Notice of Intent to prepare the ADP EIS. At that time, calendar year 2001 was selected as the Project Baseline (Existing Conditions) Year for all analyses. The results of this analysis, which includes emissions of CO, NO_x, PM_{10}, $PM_{2.5}$, and VOCs, are shown in **Table 3.5.9-1**.

As a result of the FAA's recent guidance regarding calculating particulate emissions from aircraft engines, and for disclosure purposes, impacts of $PM_{2.5}$ will be presented and addressed separately from PM_{10}. The PM_{10} and $PM_{2.5}$ emissions presented here include emissions from all airport-related sources, including aircraft. Particulate emissions from aircraft were calculated using the procedure described in the FAA policy memorandum of May 24, 2005 titled *Use of First Order Approximation (FOA) to estimate aircraft engine particulate matter (PM) emissions in NEPA Documents and Clean Air Act General Conformity Analyses*. **Section 4.2** (Air Quality) of this document contains a full discussion of the methodology, model, data sources, and assumptions used for this analysis. Additional tables showing information used in EDMS are contained in **Appendix F**. The airport-related sources of emissions that were included in the inventory are identified as aircraft, GSE, and on-site motor vehicles. The results of the inventory are expressed in units of tons per year (tpy) for each pollutant and potential emission source. In this way, comparison with the future year emission inventory for PHX can be easily made (see **Section 4.2.3**).

As shown, the primary emissions associated with PHX are in the form of CO, followed by NO_x, VOCs, PM_{10}, and $PM_{2.5}$. Ground service vehicles, followed by aircraft, are the largest potential source of emissions on airport property.

TABLE 3.5.9-1
2001 AIRPORT-RELATED SOURCES OF AIR EMISSIONS IN TONS PER YEAR (tpy)

Source	CO	NO_X	PM_{10}	$PM_{2.5}$	VOCs[5]
Aircraft[1]	2,345	1,182	36[6]	36[6]	326
Ground Support Equipment[2]	6,268	424	11	10	264
On-Site Motor Vehicles[3]	1,202	233	7	5	150
Stationary Sources[4]	<1	<1	1	1	22
Total	9,815	1,819	55	52	762

Numbers are rounded to the nearest whole number.

1 A taxi time of 19.74 minutes from the ASPM database (2001) was used in the inventory. A total of 276,662 LTO operations were modeled.

2 Ground Support Equipment (GSE) and Auxiliary Power Unit (APU) emissions were determined based on default operating times in EDMS4.1 and 2 on-site data from surveys completed in February 2003.

3 On-site motor vehicles include all parking lots and major roads located on the airport. MOBILE6.2 was used to estimate emission factors. MOBILE6 input files were prepared using guidance from the Maricopa Association of Governments (emails from T. Shin (MAG) to URS, August and September 2005).

4 Stationary source emissions (from boilers, generators, and other permitted sources located at the airport) were obtained from email from Eric Roisanen, Maricopa County Environmental Services (Nov. 2003), Includes fueling emissions for HC.

5 HC emissions were converted to VOCs and assumed to be equivalent.

6 Particulate emissions from aircraft were calculated using the procedure described in FAA policy memorandum of May 24, 2005 titled *Use of First Order Approximation (FOA) to estimate aircraft engine particulate matter (PM) emissions in NEPA Documents and Clean Air Act General Conformity Analyses.*

Source: EDMS, Version 4.12 (compiled by URS, 2004 and 2005).

3.6 WATER RESOURCES

3.6.1 SURFACE WATER AND STORMWATER RUNOFF

Phoenix lies within the watershed of the ephemeral lower Salt River, which is itself within the larger Gila River watershed. Twenty-eight miles west of PHX the Salt River joins the Gila River, the closest downstream perennial river. The Salt River flows westerly from headwaters in the White Mountains of eastern Arizona (there called the White River) and is also fed by spring snowmelt, summer rains, and base flow from ground water sources. The Salt River drains about 5,980 square miles. From its origins to the Gila confluence (about 140 miles), the Salt River is joined by the Black River and the Verde River. Despite these sources of surface water, both the Salt and Gila Rivers are primarily ephemeral streams and only flow in the vicinity of PHX during large precipitation events.

All of the major rivers draining the Salt River Valley, including the Gila, are controlled by reservoirs and most of the flow is diverted for public use. The Salt River is controlled by a chain of reservoirs and dams, upstream to down, including Roosevelt (1,336,700 acre-feet), Apache (245,100 acre-feet), Canyon (57,900 acre-feet) and Saguaro (69,800 acre-feet), all operated by the Salt River Project (SRP). The river is finally backed up by Granite Reef Diversion Dam, which allows for the complete withdrawal of water from the river and delivery to a series of irrigation and drinking supply canals on either bank.

All surface water runoff and ground to surface water discharge associated with PHX operations drain to the Salt River (Figure 3.6.1-1). Wastewater is delivered by sanitary sewer lines to the wastewater treatment plant (WWTP) at 91st Avenue in Avondale, which is operated by a consortium of five Valley cities, including Phoenix. All surface water originating at PHX is either evaporated or delivered by the Salt River or directly exported to the middle Gila River basin.

Stream Flow in the Salt River - The Salt River is ephemeral (e.g., lasting a very short time) above and below the PHX surface water outfalls. The USGS operates two gaging stations on the Salt River between the SRP reservoirs and the Gila confluence, 09502000 below the Stewart Mountain Dam and 09512165, at the Priest Road Bridge in Tempe, both upstream of the airport. All flow passing the first gage is diverted to the SRP and City of Phoenix canals. The second gage, 09512165, is directly below the Tempe Town Lake dam. These gaging stations are useful in determining the timing of flood events on the Salt River.

Data from stations 09512165, upstream of PHX, and 09514100, 15 miles downstream of the airport just below the confluence of the Salt and Gila Rivers, give the longest and most representative record of stream flow affected by airport operations (Table 3.6.1-1, Figure 3.6.1-2). However, average and peak discharge estimates for both the Salt and Gila Rivers are less informative than for perennial streams. When these streams peak, usually in response to large storm events, discharge volumes and stage heights are extremely high when compared to other times and for most of the year discharges are close to zero. The flow duration curve (Figure 3.6.1-2) indicates this with an extremely steep slope in the greater than 90 percent section of the graph. This curve suggests that the Salt and Gila Rivers flow only when the highest discharges occur (1,000 to 5,000 cfs).

TABLE 3.6.1-1
USGS HYDROLOGIC AND HYDRAULIC DATA FOR THE SALT RIVER AT PHOENIX, ARIZONA

Gage ID	Gage Name	Average Daily Flow	Maximum Annual Peak Flow	Maximum Annual Stage Measurement	Median Flow and Stage (2002 Water Year)
09512165 (upstream)	Salt River at Priest Dr. near Phoenix	1993 - 1998 170 cfs	1995 81,400 cfs	1995 12.73 feet	0 cfs 0 ft above gage
09514100 (downstream)	Gila River at Estrella Pkwy. near Goodyear, Arizona	1993 - 1999 1208 cfs	1993 162,000 cfs	1993 19.15 feet	1 cfs 0 ft above gage

Source: USGS, 2002.

The EPA has issued a National Pollutant Discharge Elimination System (NPDES) permit to the City of Phoenix as a whole that includes the airport. The airport also functions under the Multi-Sector General Permit, issued on a national basis. The Aviation Department has prepared a Storm Water Pollution Prevention Plan (SWPPP) for the airport, which identifies and requires Best Management Practices (BMPs) to ensure compliance with the NPDES permit. The most recent update to the SWPPP was approved on January 6, 2006.

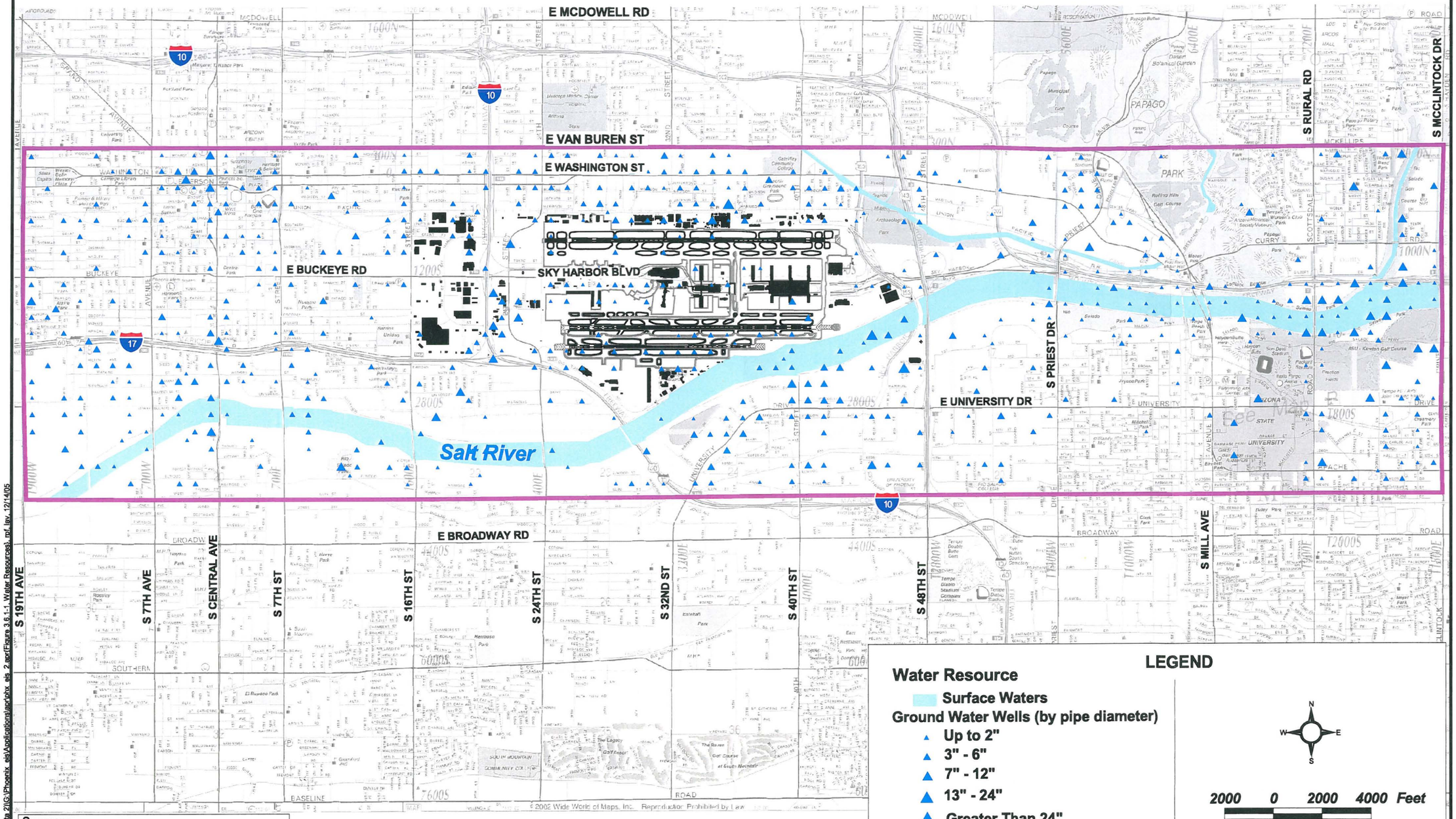
The Phoenix City Council has adopted stormwater management regulations that apply to all public storm drain systems as defined in Chapter 32C of the Phoenix City Code. These regulations are intended to reduce, to the maximum extent practicable, the addition of pollutants to stormwaters. These regulations and the SWPPP are designed to prevent violations of the City's NPDES permit.

Existing Off-Site Water Quality - As indicated previously, the Salt River is an ephemeral stream, which borders PHX. Flow only occurs when precipitation generates runoff that directly discharges to the riverbed or when the Tempe Town Lake releases water over the dam. For this reason, the water quality of the river is totally dependent upon urban stormwater flows added to it.

The Gila River is downstream of PHX. The Gila River is listed as impaired due to pesticide pollution by the State of Arizona and EPA and is planned for a Total Maximum Daily Load determination within the next five years (ADEQ, 2002). The TMDL would specify the maximum amount of a pollutant that the water body can receive and still meet water quality standards, and allocates polluted loadings among point and nonpoint pollutant sources. At this time, the stormwater discharge permits of all facilities, including PHX, will be evaluated for any impacts to water quality within the impaired reaches of the Gila River.

The City of Phoenix, under direct funding from the USACE, is attempting to use ground water to extend the perennial reaches of the Gila River up the Salt River to the I-10 highway bridge, directly abutting the DSA (Rio Salado project). For these two reasons, the off-site water quality measured within the Gila River, despite its distance downstream, is relevant to any description of affected environment of the PHX improvements. This material is summarized below and discussed further in **Appendix E** of this FEIS.

Use Designation for the Salt and Gila Rivers - Pursuant to Arizona Administrative Code R18-11-104 and the Clean Water Act (CWA), ADEQ has designated water uses by rule for the Salt and Gila Rivers in the vicinity of PHX. These designated uses are combined and compared with numeric and narrative water quality criteria to define the surface water quality standards in force for all waters of the U.S., including these two rivers. Further, under Section 305(b) of the CWA and Arizona Revised Statutes (ARS) 49-232, ADEQ is required to assess the existing and future potential attainment of these standards by all waters of the U.S. under its jurisdiction. Any waters not achieving Arizona surface water quality standards are defined as "impaired" and are to be included in a list (303(d) list) for public distribution and, after approval by the EPA, delivery to the U.S. Congress.



Sources:
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-Arizona Department of Water Resources, 2002
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

LEGEND

Water Resource

- Surface Waters

Ground Water Wells (by pipe diameter)

- Up to 2"
- 3" - 6"
- 7" - 12"
- 13" - 24"
- Greater Than 24"

Other Features

- Generalized Study Area

N
W E
S

2000 0 2000 4000 Feet

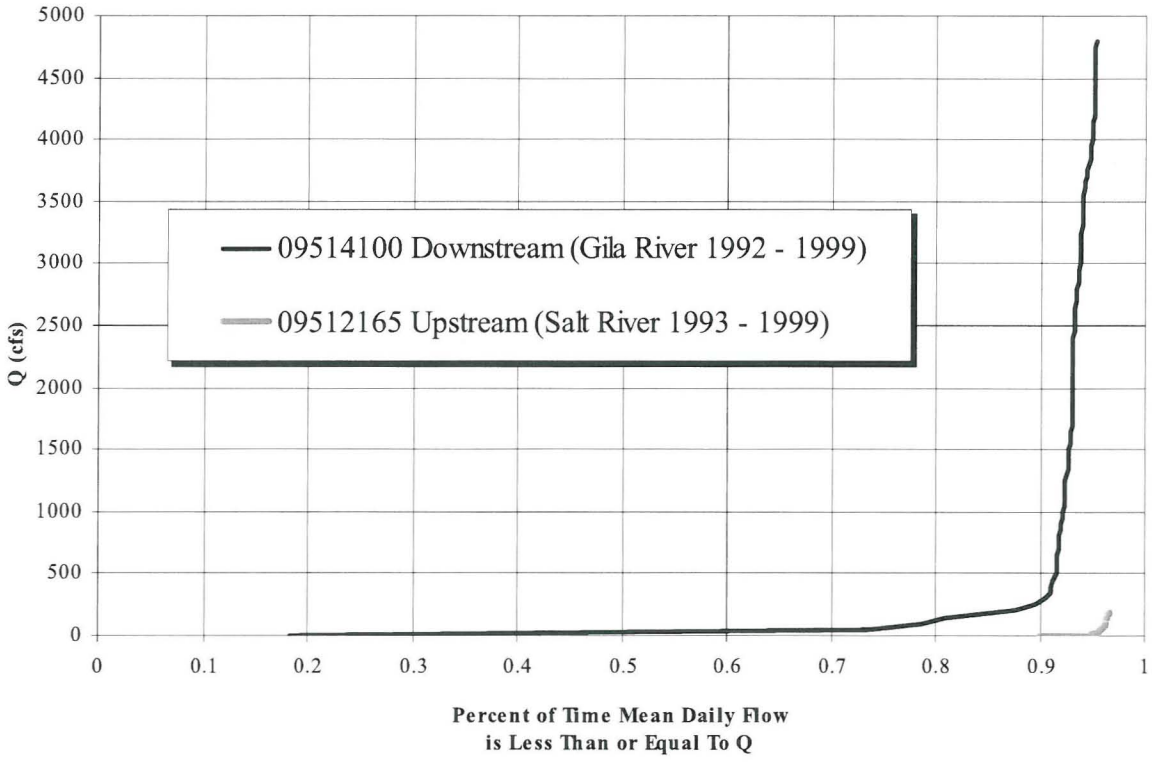
Scale: 1" = 4000'

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Water Resources

FIGURE
3.6.1-1

c:_519\cc\c1_375-GIS Data 2\G\Phoenix_eis\Applications\aprphx_eis_2.apr(Figure 3.6.1-1, Water Resources), prf, lav, 12/14/05



Source: USGS, 2002.

The Gila River Indian Community (GRIC), a Federally recognized Indian tribe, also maintains a designated use for its jurisdictional waters, with separate 303(d) listing and 305(b) reporting responsibilities. The Gila River as it passes thorough the GRIC is designated as Ephemeral Aquatic and Biota, Partial Immersion Recreation, and Fish Consumption. Parts of the Salt River under GRIC jurisdiction have the designated uses of Effluent-Dependent Aquatic and Biota and Livestock and Range (GRIC DEQ 2002). The Gila River, from the boundary with the Indian Community near Florence, AZ to the confluence with the Salt River is under the administration of the GRIC.

For assessment purposes, ADEQ has divided the Salt and Gila River watersheds at the confluence, the Salt River forming its own watershed, with the Middle Gila watershed continuing from there (ADEQ, 2002). Within the Salt River watershed, there are three designated segments upstream of PHX and two downstream. Within the Middle Gila River Watershed there are four segments, upstream of the Gila River Indian Community. Downstream of the Salt-Gila confluence, there are two reaches.

Designated uses in Arizona include ten categories (**Table 3.6.1-2**). The only designated use unique to Arizona law is the Aquatic and Wildlife, Effluent Dependent Water (A&Wedw). This use category acknowledges the fact that the introduction of treated wastewater into an ephemeral stream creates a new riparian and aquatic habitat that has a distinct ecological character and functional form.

The banks of the reach of Salt River from Granite Reef Dam to the I-10 bridge includes PHX and is designated for Aquatic and Wildlife, Ephemeral (A&We) and Partial Body Contact (PBC) use by current Arizona law (see **Appendix E**). From the I-10 Bridge to the 23rd Avenue WWTP, the reach is designated to be used for Aquatic and Wildlife, warm water (A&Ww), PBC and Fish Consumption (FC). From the treatment plant to the Salt-Gila confluence, the reach is designated for A&Wedw, PBC, FC and Agricultural, Irrigation (AgI) and Agricultural, Livestock (AgL) (ADEQ, 2002).

Use Attainability of the Salt and Gila Rivers - In general, streams that are impaired with respect to their designated uses require a Total Maximum Daily Load (TMDL) analysis, under state and Federal law. In 2001, ADEQ proposed a new system of assessing impairment for streams in Arizona not attaining their designated uses. This system includes both a 303(d) list of streams designated as impaired and awaiting or going through a TMDL and a four-part planning list (Planning List), which is composed of streams that are either: 1) streams attaining all of their uses but requiring additional monitoring, 2) streams attaining some, but not all, of their designated uses, 3) streams where the data are inconclusive, or 4) streams assessed as not attaining but not impaired, thereby not requiring a TMDL.

In 2002, ADEQ released a combined draft 303(d) list and 305(b) assessment report for public comment. In that report, the middle Gila River from Hayden Dam to Gillespie Dam is proposed for the planning list under Part 3, "Inconclusive." All of these five reaches were listed on the 1998 303(d) list for DDT breakdown compounds, chlordane, toxaphene, and dieldrin (pesticides). The GRIC has yet to release a 303(d) list.

TABLE 3.6.1-2
STATE OF ARIZONA DESIGNATED USES AND USE SUPPORT CATEGORIES

Designated Uses	Designated Use Support
Designed uses are specified for stream segments and lakes in the surface water rules (Arizona Administrative Code R18-11-104). Waterbodies not listed in the rules obtain their designated uses through the "Tributary Rule." Arizona's surface water designated uses include: • Aquatic and Wildlife • Coldwater Fishery (A&Wc) • Warmwater Fishery (A&Ww) • Ephemeral Stream (A&We) • Effluent Dependent Water (A&Wedw), • Domestic Water Source (DWS), • Fish Consumption (FC), • Full Body Contact (FBC) (i.e., swimming), • Partial Body Contact (PBC) (i.e., non-swimming recreation), • Agricultural Irrigation (AgI), and • Agricultural Livestock Watering (AgL).	**Attaining** - Surface water quality standards are being met based on a minimum of three monitoring events that provide seasonal representation and core parametric coverage. **Threatened** - Surface water quality standards are currently being met, but a trend analysis indicates that the surface water is likely to be impaired before the next assessment. **Impaired** - Surface water quality standards are not being met based on sufficient number of samples to meet the test of impairment identified in the Impaired Waters Identification Rule. **Not Attaining** - Surface water is not attaining its uses, but a TMDL does not need to be completed because: 1) a TMDL has been approved and being implemented, 2) another action is occurring so that the surface water is expected to attain its uses before the next assessment, or 3) the impairment is due to pollution where a pollutant loading cannot be calculated (e.g., hydromodification). **Inconclusive** - Monitoring or other assessment information available is insufficient to assess the surface water as "attaining," "threatened," "impaired," or "not attaining." **Not Assessed** - Only one water sample or no samples. No information indicating that a narrative standard may be violated.

Source: ADEQ, 2002.

The Salt River below the 23rd Avenue WWTP was also listed for the same pesticides as the Gila River on the 1998 303(d) list. In addition, it has also been proposed for the Planning List. The Grand Canal has also been added to the Planning List, Part 3 (Inconclusive) due to a lack of adequate data. All other reaches of the Salt are listed as Attaining All Uses, Part 1.

Sources of Impairment - In the 305(b) report, ADEQ does not identify the source of pesticides in the middle Gila and Salt rivers. However the USGS does conclude (Cordy, et al, 2000) that the past use of agricultural pesticides and herbicides in the west Salt River Valley is the ultimate origin of these compounds and further concludes that they are now accumulative in fish tissue and sediment along the impacted reaches.

Current Surface Water Impacts from PHX - None of the pesticides listed in the 303(d) and 305(b) assessment reports are currently used. Therefore, the mobilization of the compounds must include the re-suspension of previously contaminated sediment and transport off site. Given that most of PHX is impervious and paved, the fraction of suspended sediment from soil is very low. At this time, there is no indication from ADEQ (ADEQ, 2002) that there are any impacts to surface water from PHX.

Appendix E of this FEIS presents additional information on use attainability, sources of impact, and BMPs to address water quality improvement issues in the Salt and Gila rivers.

3.6.2 GROUND WATER

PHX is located in the southeastern portion of the West Salt River Valley area of the Phoenix metropolitan area. The West Salt River Valley Area contains crystalline rocks of mountain ranges and basement beneath alluvial-filled basins (Figure 3.6.2-1). The basement forms a relatively impermeable barrier to groundwater flow. The primary sources of ground water are the Middle Unit and the upper interval of the Lower Unit (Brown and Pool, 1989). Groundwater is present in the Upper Unit in areas near the margins of the West Salt River Valley area. The Upper Unit is an important interval for the transmittal of water from major surface drainages to the level of ground water during periods of flood flow.

The regional aquifer in the vicinity of PHX has been reported to be approximately 50 to 70 feet below ground surface (bgs) in 1991-1992 (see Figure 3.6.2-1). In 2000, water levels measured in wells at the upstream end of PHX were about 1,124 ft MSL in elevation, about 11 ft bgs but may be influenced by the filling of Tempe Town Lake. The regional flow direction is to the west/northwest (Hammett and Herther, 1995). Based on data obtained from groundwater remediation projects ongoing in the western portion of the airport (i.e., west of Terminal 2), the groundwater gradient ranges from about 0.001 to 0.004 feet per foot and flow direction varies from west to west/northwest. The variation in flow direction is a direct result of water flow within the Salt River. During periods of flow in the Salt River, the ground water flow direction trends to the northwest. When the Salt River is dry, the ground water flow direction trends more to the west.

The City of Phoenix Aviation Department is currently tracking ground water elevation in a series of monitor wells installed across the airport, from the east side of Terminal 4 to the 24th Street on the west. Based on data obtained from dataloggers within selected wells, the gradient across the eastern boundary appears to be greater than the gradient observed in the western portion of the airport.

Environmental investigations associated with the Motorola 52nd Street Superfund site have indicated the presence of a bedrock ridge trending from the southeast to the northwest across the airport. There are numerous data north of Runway 8/26 indicating the elevation of the top of bedrock, but fewer data are available in the areas of terminals and the south runways. This bedrock ridge has been postulated to affect ground water flow across the airport.

The rate at which water can move through a permeable medium at PHX is expected to range from 13 to 339 feet per day (ft/day) based on a variety of aquifer tests conducted in the area surrounding the airport (IT, 1999). The United States Geological Survey reports that rate of permeability within the Upper Alluvial Unit ranges from 180 to 1,700 ft/day.

Groundwater investigations and remediation projects are underway at various locations across the airport. These projects are being performed under the jurisdiction and oversight of the ADEQ or USEPA, as appropriate. These include:

- An Arizona Fueling Facilities Corporation (AFFC) Jet A liquid-phase hydrocarbon plume northwest of Terminal 3;
- The West Sky Harbor Jet A liquid-phase hydrocarbon plume west of Terminal 2;
- The Honeywell Jet A liquid phase fuel plume investigation northeast of Terminal 3;
- An Arizona Air National Guard JP-4 plume south of the south runway; and
- Low level chlorinated VOCs in ground water throughout PHX from the Motorola 52nd Street Superfund site located northeast of the airport and Estes landfill located south of the Salt River.

In addition to the production, remediation and monitoring wells associated with PHX operations, there are numerous ground water wells located adjacent to the property (refer to Figure 3.6.1-1). Data was taken from the ADWR 55 database available on-line from ADWR.

3.6.3 WATER SUPPLY

Potable water is supplied to the airport by the City of Phoenix Water Services Department. Water for Phoenix comes from several sources. About 96 percent of the water used by the city comes from surface water sources, with 60 percent coming from the Verde and Salt Rivers. The city maintains five water treatment plants with a combined capacity of 600 million gallons per day (mgd). Four percent of the City of Phoenix water supply comes from wells, located throughout the Salt River Valley. There are no sole source aquifers in the area of the project.

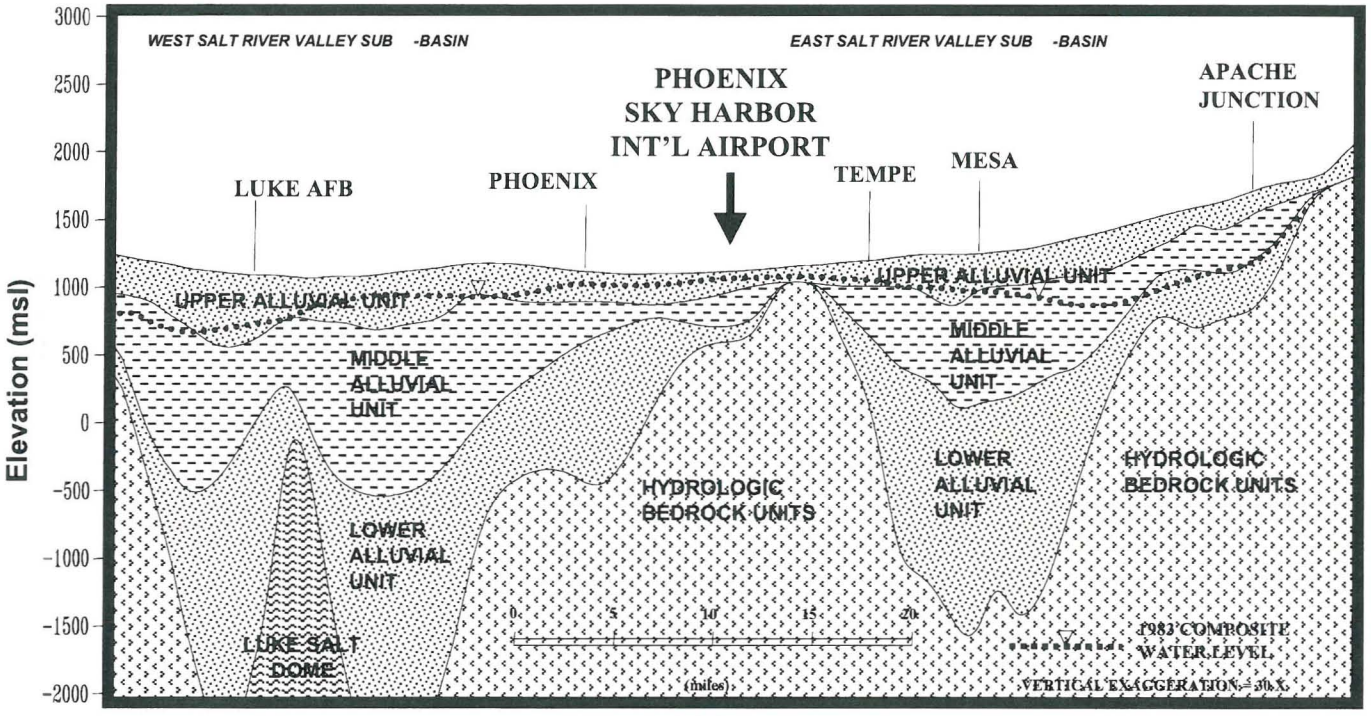
Colorado River water flows to Phoenix through the Central Arizona Project (CAP) Canal. Most of Phoenix's CAP water is purified at the Union Hills Water Treatment Plant. Water from the Salt and Verde rivers is delivered to Phoenix by the Arizona Canal, operated by Salt River Project, and is treated at the Verde, Squaw Peak, Deer Valley and Val Vista water treatment plants. Water from the CAP also can be diverted to all but the Verde Plant.

The city is currently developing an additional water treatment plant at Lake Pleasant in northern Maricopa County. The plant would be designed to treat 320 mgd of Colorado River (and Agua Fria River) water delivered by the CAP.

During calendar year 2004, a total of 130,946,376 gallons of potable water were used to support airport and terminal operations at PHX. Terminal operations require potable water for drinking and sanitary use, concessions, and routine maintenance activities. Water use by terminal was Terminal 2 - 19,762,908 gallons; Terminal 3 - 39,620,812 gallons; and Terminal 4 - 71,562,656 gallons. (City of Phoenix Water Department, 2005).

3.6.4 SANITARY WASTEWATER TREATMENT

All municipal sewerage is conveyed from PHX off site to the City of Phoenix municipal collection infrastructure. The City of Phoenix utilizes two WWTPs that discharge to the Salt River, the larger of which is the 91st Avenue WWTP, and a much smaller plant, the 23rd Avenue WWTP. The 91st Avenue WWTP has a rated capacity of 161.75 mgd. These plants provide primary and secondary treatment of municipal waste. Sewage production is not metered at the airport. However, based on the water use rate of 130,946,376 gallons per year and an assumed 15 percent loss (industry standard), the production of wastewater at PHX during calendar year 2004 is estimated at 111,304,420 gallons per year. See Section 4.17 for Water Reservoir impacts of the No-Action Alternative and proposed project.



Note: East-West cross-section

Source: Brown and Pool, 1989 (USGS Water Resources Investigation Report)

ATG/DaveA/PhoenixEIS/PDEIS/FromPhoenixOffice/Figure 4_3_3-2.ppt

Phoenix Sky Harbor INTERNATIONAL AIRPORT

Environmental Impact Statement

Salt River Valley Generalized Hydrogeologic Cross-Section

Figure 3.6.2-1

Date: 12/10/03

3.7 HAZARDOUS MATERIALS AND ENVIRONMENTAL CONTAMINATION

3.7.1 INTRODUCTION

This process of identifying sites and facilities of known, suspected, or with the potential to contain hazardous substances and/or environmental contamination was accomplished with: a) visual in-the-field survey of existing conditions; b) review of available documents (i.e., site contamination investigation and remediation reports); c) an electronic database search of Federal and state regulatory agency records; and d) the assistance of the environmental staff of the City of Phoenix Aviation Department. Importantly, this assessment is not meant to serve as a formal Phase I/II Environmental Site Assessment, contamination site assessment or remedial action plan of PHX, the EIS Area of Disturbance or its environs.

3.7.2 ASSESSMENT METHODOLOGY

From the standpoint of hazardous substances, the existing facilities and land uses at PHX are, on a whole, typical of a large commercial airport. On-site, these facilities and activities generally involve the servicing, refueling, and repair of aircraft; the passenger terminals and motor vehicle parking facilities; the FAA control tower and City of Phoenix Aviation Department administrative offices; rental car staging and refueling facilities; air cargo and general aviation areas; and a few other special purposes connected with operating the airport (i.e., airfield, roadway, and building maintenance). Off-airport land uses include a mixture of commercial, warehousing, industrial, and residential uses (see **Section 3.4**, Land Use). Based on a visual survey of these areas and facilities, some of these on- and off-airport activities involve the use of hazardous substances and the generation of hazardous wastes.

A computerized survey of Federal, state, and local regulatory agency files and databases was conducted in support of the EIS analysis (EDR, 2002) to identify potential hazardous substances sites. As a screening tool, this database helps locate spill sites, generators of hazardous wastes, landfills, underground storage tanks (USTs), etc. (including sites on the National Priorities List (NPL) under the Superfund Programs), that have been reported to exist in the vicinity of PHX.

The primary source of information concerning the existence of sites and facilities located in the vicinity of the EIS Area of Disturbance that have the potential to contain hazardous materials and/or environmental contamination was the City of Phoenix Aviation Department, Environmental Section. This office maintains an up-to-date collection of reports, drawings, and other documents prepared by the city; Federal, state and local agencies; the airport tenants; and some of the neighboring airport businesses. For the purposes of this analysis, the staff of this office prepared a synopsis of these documents as they potentially involve the EIS Area of Disturbance.

The information that was collected and/or developed in support of this assessment is summarized in **Table 3.7.2-1**. This information is presented by site name; location (with respect to the airport); owner/operator and a brief characterization of the site as it pertains to hazardous substances; environmental contamination; and/or other regulated substances. The locations of these sites and facilities are shown on **Figure 3.7.2-1**. (It is important to note that the naming of a site or facility on **Figure 3.7.2-1** and **Table 3.7.2-1** does not necessarily mean that a spill or discharge has occurred or the site represents an environmental condition posing a risk to human health and welfare. Rather, these sites are identified because such incidents have been recorded in the regulatory database or the facilities are known (or are expected) to contain hazardous or regulated materials or environmental contamination.)

3.7.3 ASSESSMENT FINDINGS

There are several sites and facilities located within, or in close proximity to, the EIS Area of Disturbance at PHX that are known or have the potential to involve hazardous materials, environmental contamination, and/or other regulated substances. For ease in locating and describing these sites, they are grouped into three general areas: Terminal 2 Area, Sky Harbor Boulevard Area, and the I-10 Corridor. These areas are discussed separately below:

Terminal 2 Area - The Terminal 2 area contains both active and inactive underground fuel lines and existing or former underground and aboveground storage tanks from which leaks, spills, and small discharges of fuel have occurred. A number of small quantity generators of hazardous wastes are also located in the area. No leaks or spills of hazardous materials from these sites have occurred. A contingency plan would be developed prior to the initiation of construction for addressing advanced fuel systems and/or soil/groundwater contamination that may be encountered during construction. The Terminal 2 area contains several sites where the releases of petroleum products (i.e., jet fuel, avgas, gasoline, etc.) over time have caused both soil and groundwater contamination. Among these, perhaps the largest area of contamination is associated with the Terminal 2 Jet Fuel Plume (Free Product) Remediation Project (Site 2 on Figure 3.7.2-1).

The release of jet fuel at this site was discovered in 1997 near the northeast corner of the Terminal 2 Parking Garage. A cleanup was conducted in the immediate vicinity of the release, which was followed up with a comprehensive assessment and remediation program. Arizona Fueling Facilities Corporation (AFFC), the responsible party for the release, has been conducting the assessment and remediation activities. Subsequent to their definition of the extent of the product plume, AFFC's consultants designed and operated a remediation system to recover the free product floating on the groundwater table. The system was a dual-phase recovery system that extracted free product and groundwater from the subsurface. The water pumping draws down the water table to facilitate more efficient collection of the residual free product in the recovery wells. The system has been operated since 2001.

The groundwater table in the vicinity of the Terminal 2 site has been subject to dramatic variations since the release occurred. The variations in water table have led to the smearing of the free product within the soils it encounters. As a result of the variations in the water table, there also is the potential for the generation of methane, which results in the subsurface as a result of the anaerobic degradation of the petroleum. Anaerobic conditions naturally exist around the water table in the vicinity of the plume.

The City and AFFC have agreed that a bioventing system would be constructed and operated in the areas of the plume where residual contamination exists. Bioventing is a technology in which air is introduced into the subsurface for the purposes of preventing the anaerobic production of methane and to foster the aerobic degradation of the residual petroleum compounds in the soil. The bioventing at the airport has been designed to be implemented in three phases. The first phase (Phase IA) is the source (original release) area. It was constructed and the operations began in January 2005. Satisfactory results have been realized so far in terms of distribution of oxygen in the area and the lack of methane generation.

TABLE 3.7.2-1
SITES OF KNOWN OR POTENTIAL ENVIRONMENTAL CONTAMINATION IN THE VICINITY OF THE AREA OF DISTURBANCE[a]

ID[b]	Site Name[c]	Location[d]	Owner/ Operator[e]	Site Description and Type/ Extent of Contamination[f]	Current Status[g]
1	Honeywell Fuel Plume	34th St. N.E. of Terminal 3	Honeywell	LUST - Jet A fuel plume	Corrective Action Plan approved by ADEQ on October 7, 2005.
2	Terminal 2 Jet Fuel (Free Product) Plume	W. of Terminal 3 - N. Concourse; N.E. of Terminal 2 Parking Garage, extending W. to the FBO area (i.e., Swift Aviation).	AFFC	An estimated 1.6 million-gallon leak of jet fuel; free floating product covers approximately 90 acres with average thickness of 2 feet; contaminated soil "smear zone" located 70-95 feet below ground surface.	Initial site characterization study completed, and cleanup underway through a combination of groundwater extraction, free product recovery, and treated groundwater injection for plume containment and air injection for prevention of methane generation and bioremediation of soil.
3	Former Texaco Station	Between N. and S. Sky Harbor Blvd., W. of Terminal 2	Texaco Corp.	Unknown; potential for contaminated soil associated with former USTs.	Based on limited documentation, petroleum products (i.e., gasoline, diesel, waste oil) were removed prior to site vacancy; but closing/ abandonment procedures of the USTs do not meet current guidelines.
4	Fuel Truck Loading Rack	E. of former Terminal 1 and W. of Terminal 2	AFFC	Connected to the AFFC hydrant fueling system; used for loading Jet A into aircraft fuel delivery trucks; no spills, leaks, or discharges currently reported or known to exist.	Baseline (Phase1) environmental condition assessment was conducted prior to construction and the facility is included in annual leak/tightness test of hydrant system.
5	Former Fuel Pipeline (Inactive)	N. of the West Sky Harbor Fuel Facility, situated east-to-west beneath Buckeye Rd.	Unknown	Installed prior to 1957; comprised of 3 steel underground fuel lines; potential for contaminated soil and ground water from historic spills, leaks, or other discharges of jet and aviation fuels.	It is unknown whether the pipeline was removed or abandoned in-place.

TABLE 3.7.2-1 (CONTINUED)
SITES OF KNOWN OR POTENTIAL ENVIRONMENTAL CONTAMINATION
IN THE VICINITY OF THE AREA OF DISTURBANCE[a]

ID[b]	Site Name[c]	Location[d]	Owner/ Operator[e]	Site Description and Type/ Extent of Contamination[f]	Current Status[g]
6	West Sky Harbor Fuel Facility	W. of former Terminal 1	Unknown. (City has been remediating)	Site of former USTs and/or LUSTs containing jet fuel, avgas and gasoline; previous users include airlines, fuel distributors, and the city; now inactive. Estimated 750,000 gallons released; smear zone of contaminated soils extends approximately 40 to 95 feet below ground surface; free product footprint is approximately 11acres with an average thickness of 1 foot; several small areas of shallow soil contamination have been identified.	Groundwater monitoring and sampling have been performed since 1989; a corrective action plan (CAP) was submitted to the ADEQ in 1995; in 2001/2002, the city completed additional site characterization and pilot testing of remediation system as part of a feasibility study to augment and accelerate site cleanup. A biosparging and soil vapor extraction remediation system has been constructed and is now being operated at the site on a pilot study basis.
7	Former General Aviation Pipeline	W. of former Terminal 1, extending N. to the Executive Terminal.	City of Phoenix	Pipeline was tested for tightness for four consecutive years (1991-1994) and results indicated no leakage; fuel was removed in 1997 and the pipeline was abandoned in-place; no known residual environmental contamination.	In-place abandonment and closure of the pipeline were approved by ADEQ in November 1997.
8	52nd St. Superfund Site (Motorola/ Honeywell Operable Unit No. 2)	A widespread area originating off the airport-site; beginning near 52nd St./McDowell Ave. and extending W. under E. Washington St. and the northwest quadrant of PHX.	Motorola/ Honeywell	Federal and state "Superfund" site comprised of dissolved VOCs in the groundwater.	Numerous reports for Motorola 52nd Street; Motorola 52nd Street Operable Unit 2; Allied Signal/Honeywell Site Characterization reports; City of Phoenix WQARF information and groundwater database.
9	Executive Terminal Aboveground Storage Tank (AST) Fuel Farm	W. of the Executive Terminal	City of Phoenix (Leased to Service Air)	Site of several ASTs containing jet fuel, avgas, and other petroleum products; no known soil or groundwater contamination.	Not applicable.
10	Executive Terminal Former UST	W. of the Executive Terminal	City of Phoenix	Site of former LUST; contaminated soils and tank removed in 1989.	Tank now removed and site remediation completed in accordance with ADEQ guidelines.

TABLE 3.7.2-1 (CONTINUED)
SITES OF KNOWN OR POTENTIAL ENVIRONMENTAL CONTAMINATION IN THE VICINITY OF THE AREA OF DISTURBANCE[a]

ID[b]	Site Name[c]	Location[d]	Owner/ Operator[e]	Site Description and Type/ Extent of Contamination[f]	Current Status[g]
11	FAA TRACON Facility Former UST	W. of the Executive Terminal; E. of the FAA TRACON Facility	FAA	Site of 2,000-gallon diesel UST for back-up generator and small release of fuel (less than 100 gallons).	Not applicable.
12	Swift Aviation UST Facility (GTA)	W. of FBO Area (Cutter Aviation Airfield)	Swift Aviation	Former site of Sawyer Aviation USTs, former auto body shop, and reported possible septic systems and other dumping activities. No known LUSTs or other environmental contamination or USTs.	USTs registered with ADEQ. Removed in 2004.
13	Sawyer UST	N. of N. Sky Harbor Blvd.	Swift	Site of UST and reported release of fuel due to overfills.	USTs (5) removed in 2005. No further action required.
14	Former Hertz Facility UST	N. of Air Cargo Area	Hertz Corporation	Site of former UST and gasoline release to groundwater; plume merges with the western edge of the West Sky Harbor groundwater plume.	Corrective Action Plan prepared and submitted to ADEQ.
15	Former Hazardous Waste Sump at Book Cellar	N. of Sky Harbor Blvd. and S. 23rd St.	City of Phoenix	Site of former waste sump and Kitchell property; now closed, removed, and remediated by the City.	Not applicable.
16	Tire Pro	NE corner of Buckeye Rd. and Old 24th St.	City of Phoenix (currently leased to Tire Pro)	City performed environmental assessment of the property prior to demolition (former Case Tire/Micro-Tronics Site).	Not applicable.
17	Goettl Property	E. of I-10, S. of Buckeye Rd. on E. Broadway Rd.	City of Phoenix	City performed environmental assessment of the property prior to demolition (sump).	Not applicable.
18	Greyhound Bus Station UST	E. of I-10, S. of Buckeye Rd., W. of 24th St.	City of Phoenix	Site of USTs; still in-place; approximately 17 tons of contaminated soil excavated and disposed in 1996 by the City.	UST registered with ADEQ.
19	National Car Rental USTs	E. of I-10, S. of Buckeye Rd., W. of 24th St.	City of Phoenix	Site of two 12,000-gallon USTs; no known contamination.	USTs registered with ADEQ.
20	Budget Rental Car USTs	E. of I-10, S. of Buckeye Rd., W. of 24th St.	City of Phoenix	Site of three 10,000-gallon USTs; no known contamination.	USTs registered with ADEQ.

TABLE 3.7.2-1 (CONTINUED)
SITES OF KNOWN OR POTENTIAL ENVIRONMENTAL CONTAMINATION IN THE VICINITY OF THE AREA OF DISTURBANCE[a]

ID[b]	Site Name[c]	Location[d]	Owner/ Operator[e]	Site Description and Type/ Extent of Contamination[f]	Current Status[g]
21	Gannon & Scott	E. of I-10, S. of Mohave St.	Gannon and Scott	Former site of Handy Harmon, UST and drywells; contaminated soils (cyanide, lead, etc.) appear to be present in sumps, soils and in dry wells. Underground tanks may be present.	Unknown.
22	Tonto Lot	N. of Sky Harbor Blvd., E. of 24th St.	City of Phoenix	Site of former residential area containing cisterns; no known contamination.	Not applicable.
23	Hertz Rental Car USTs	W. of 24th Street, S. of S. Pacific train tracks	City of Phoenix	Site of four USTs (10,000 to 12,000 gallons); no known contamination.	USTs registered with ADEQ.
	Various property acquisitions	E. of I-10, N. of E. Washington St.	Various owners including McEwen Lumber/Frazee Deero Paint/City of Phoenix Traffic Signal Shop/Swimming Pool Service and Repair	Site of multiple former land uses with the potential to involve the use, storage, and/or disposal of hazardous materials or other regulated substances. Phase I/II due diligence audits will be performed per City policy before acquisition.	Unknown.

a. The study area shown on, adjacent to, or in the immediate vicinity of, the Area of Disturbance, see Figure 3-2.
b. I.D. for Figure 3.7.2-1 illustrating the location of the site or facility.
c. The official assigned or commonly used name of the site or facility.
d. The approximate location with respect to the West Terminal area using airport/airfield landmarks as reference points.
e. Current owner and/or operator that is responsible for the facility or site.
f. General description of contaminant types, geographic and vertical extent of contamination, source of spill or leak as excerpted from the applicable contamination assessment reports, clean up plans, EDDAs, etc.
g. Summary of current status pertaining to regulatory requirements, investigatory and clean up plans, etc.

Sources: City of Phoenix, 2004; EDR, 2004.

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Sites with Known/Potential Environmental Concerns within the EIS Area of Disturbance

E VAN BUREN ST

E WASHINGTON ST

SKY HARBOR BLVD

Salt River

Elev. 1133 ft MSL

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

LEGEND

- Sites with Known/Potential Environmental Concerns
- Approximate Limit of Contaminate Plume

Other Features

- Detailed Study Area
- Generalized Study Area
- Area of Disturbance
- Airport Property Boundary

N W E S

500 0 500 1000 Feet

Scale: 1" = 1500'

Sources:
-©2002 Wide World of Maps, Inc. (Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

FIGURE 3.7.2-1

c:\1_516\dx\c1_375-GIS Data 2\IG\Phoenix_eis\Applications\arcIobx_eis_2.apr(Figure 3.7.2-1_Sites with Known-Potential Environmental Concerns within the EIS Area of Disturbance)_mf_12/14/05

The second phase of bioventing (Phase IB) will occur to the south of the Terminal 2 Garage in an area shown to be impacted by the plume. Phase IB has been constructed and operations began in September 2005. Phase II is to be constructed in the area currently covered by the dual-phase extraction system. It will be implemented after the extraction systems have been shut down and monitoring indicates that product does not appear to be re-emerging in the extraction wells.

A second, smaller plume of petroleum-based contamination in this area is located in the vicinity of the West Sky Harbor Fuel Farm (Site 6 on Figure 3.7.2-1). This site is located west of the former Terminal 1 and was used until the mid-1990s by airlines and the city for the storage of jet fuel, avgas, and gasoline (City of Phoenix, 2001). West Sky Harbor is a portion of the airport that currently has limited activity. It has been the subject of a comprehensive assessment and remediation study program for a number of years. Most of the USTs, ASTs and underground piping associated with this facility have been removed or abandoned in place. A few remaining tanks (both USTs and ASTs) used for the storage of fuel and waste oil by the City have been removed.

In 2000, the lateral extent of the "free product" (fuel) plume at this site encompasses about 11.5 acres in an east-to-west configuration and consists primarily of jet fuel. The soil beneath the site is also contaminated with petroleum hydrocarbons to a depth of approximately 80 feet bls. Trace levels of solvents have also been detected in the groundwater immediately around the site.

The West Sky Harbor Plume is located immediately to the southwest of the Terminal 2 Jet Fuel Plume (Site 2) but the plumes have not co-mingled (Hughto, 2004). The City of Phoenix has evaluated different remedial approaches, and has selected soil vapor extraction (SVE) and biosparging as the remedy. Biosparging is a technology by which air is introduced into the subsurface environment below the water table with two objectives: (1) vaporize the volatile components of the contaminant mass and (2) activate and maintain the in-situ aerobic bacterial community that is capable of degrading those portions of the contaminant mass that are not vaporized. The SVE is a technology that extracts the vaporized contaminants from the subsurface. The City is currently conducting a pilot study of the selected remedial approach.

Sky Harbor Boulevard Area - This area has a few, comparatively smaller, sites of existing or former underground and/or above ground petroleum storage tanks (Sites 12, 13, 15, 16, 17, and 22). These facilities are associated with the fueling of general aviation aircraft, rental cars, and back-up generators. This area is also characterized as having a number of small quantity generators of hazardous wastes and other sources of regulated solid wastes.

I-10 Corridor - This area consists of a variety of existing and former land uses (i.e., rental car agencies, bus depot and light industrial/manufacturing) that used both above ground and below ground storage tanks for fuel and other petroleum-based products (Sites 18, 19, 20, 21, 23, and 24). Some of these properties are classified as small quantity generators of hazardous wastes or are suspected of utilizing other regulated materials on-site.

Motorola 52nd Street NPL Site/Honeywell 34th Street Site – Another source of environmental contamination located off the airport but with the potential to have impacted the groundwater in the EIS Area of Disturbance is the 52nd Street Superfund Site/Honeywell 34th Street Site (Site 8). This site is

located approximately 1.5 miles northeast of PHX, and has been included by the U.S EPA on their National Priorities List (NPL) of Superfund sites. The contamination conditions resulted from releases of Chlorinated Volatile Organic Solvents (CVOCs), primarily 1,1,1 trichloroethane (TCA) and trichloroethylene (TCE) from the Motorola 52nd Street and Honeywell facilities. Other potential sources of CVOC contamination are currently being investigated. In addition, petroleum products, primarily jet fuel, emanate from the Honeywell 34th Street facility and have commingled with the CVOCs. The contaminant plumes have migrated onto the airport. Currently, consultants representing the Potentially Responsible Parties (PRPs) for the Honeywell site are assessing the site conditions and have begun planning for remediation of the jet fuel. Honeywell representatives are developing a remediation plan, which is also intended to incidentally address the CVOCs commingled in the jet fuel plume. On October 7, 2005, the ADEQ approved the Corrective Action Plan for the Honeywell 34th Street Facility (see **Appendix A** of this FEIS). Based on studies conducted on behalf of the airport, it is unlikely that this plume has extended into the EIS Area of Disturbance (Hughto, 2004).

Information collected, developed, and presented in this section of this assessment is also used in **Section 4.10**, Hazardous Substances, to determine the effect, if any, the PHX improvement alternatives would have on sites and facilities that contain, or have the potential to contain, hazardous wastes, environmental contamination, or other regulated substances.

3.8 U.S. DEPARTMENT OF TRANSPORTATION SECTION 4(f) RESOURCES AND U.S. DEPARTMENT OF INTERIOR SECTION 6(f) RESOURCES

3.8.1 SECTION 4(f) RESOURCES

The Department of Transportation Act, Section 4(f) [codified at 49 U.S.C. Section 303(c)] provides protection for special properties, including publicly owned lands of a public park, recreation area, or wildlife and waterfowl refuge of National, state, or local significance, or any historic site of National, state, or local significance. Any publicly owned park, recreation area, refuge, or historic site is presumed to be significant unless the responsible Federal, state, or local official with jurisdiction over those properties indicates otherwise. Protection also applies to non-publicly owned historic properties if officials having jurisdiction determine that they have National, state, or local significance. Section 4(f) does not apply to archaeological resources if the FAA, in consultation with the SHPO, determines that they are not important for preservation in place and their important information can be recovered and preserved through study (FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, Appendix A, Section 6).

The Secretary of Transportation will not approve a project that requires the use of land within a Section 4(f) resource unless there is no feasible and prudent alternative to the use of such land, and the project includes all possible planning to minimize harm resulting from that use. For the purposes of Section 4(f) resources, a "use" is a permanent acquisition or direct taking of the property or a temporary occupancy that is adverse to the statute's preservationist purposes. Section 4(f) also applies to "constructive uses," which are proximity impacts so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired (Environmental Impact and Related Procedures, Title 23, Code of Federal Regulations, Part

771.135(p)(2). The FAA uses the Federal Highway Administration regulations as guidelines in assessing Section 4(f) impacts).

The City of Phoenix Parks and Recreation Department operates more than 200 parks throughout the city. Within the GSA, the City of Phoenix owns 12 parks, the City of Tempe owns 15, and Maricopa County owns 2. Playgrounds, ballfields, and other related recreational facilities associated with public schools located within the GSA were inventoried. Administrative personnel were contacted at each school to determine whether recreational facilities are available for public use because the provisions of Section 4(f) apply only if the general public is permitted use of such facilities. Three schools have recreational facilities available to the public and Arizona State University operates a golf course open to the public. Information about the 33 park and recreational facilities identified as Section 4(f) resources is summarized on **Table 3.8.1-1** and mapped on **Figure 3.8.1-1**. Section 4(f) impacts associated with the No-Action Alternative and proposed project can be found in **Section 4.6** of this FEIS.

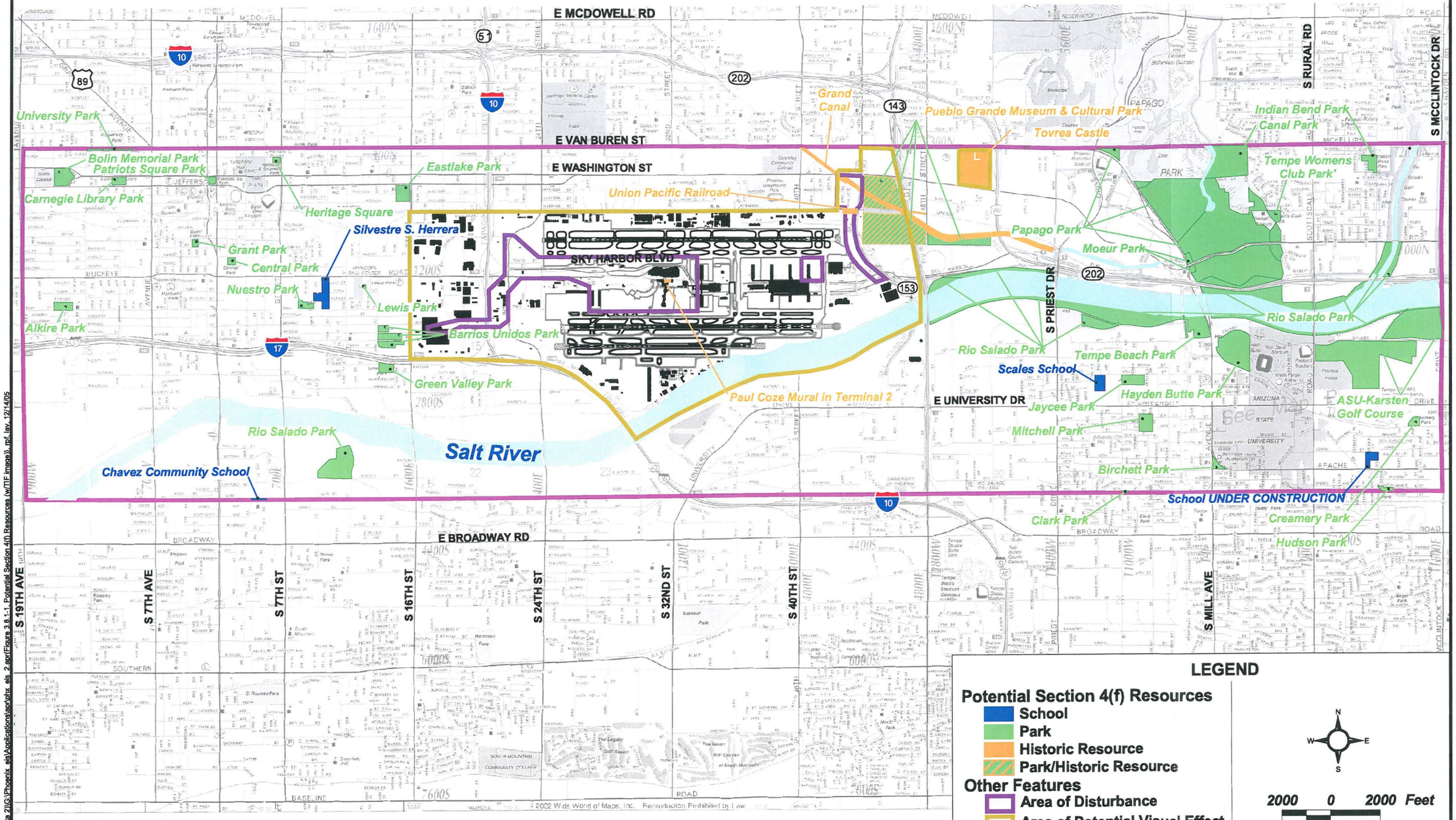
Historic sites subject to Section 4(f) protection were identified in conjunction with cultural resource studies conducted to support compliance with Section 106 of the National Historic Preservation Act (refer to **Section 3.9**). Historic resources of National, state, and local significance were identified by reviewing the National Register of Historic Places, Arizona Register of Historic Places, and City of Phoenix Register of Historic Places. The criteria for listing on all three registers are essentially identical. In addition, field inventories were conducted in consultation with the Phoenix City Historic Preservation Officer (CHPO), Phoenix City Archaeologist, and State Historic Preservation Officer (SHPO) (refer to **Appendix C**) to evaluate unrecorded historic-age buildings, structures, and objects.

Six historic resources were identified as Section 4(f) resources within the area of potential effects for construction and visual impacts defined for the Section 106 inventories (**Table 3.8.1-2**). (See **Section 3.9** and **Appendix C** for more discussion of the area of potential effect and description of these historic resources. The resources are mapped on **Figure 3.9.5-1**) Although three of the identified Section 4(f) resources are within the area of potential effects for construction impacts, no land from any of these resources would be acquired and used by the project. The sites within the area of potential effects were also evaluated for potential constructive use (proximity) impacts. Results of this evaluation are contained in **Section 4.6** of this FEIS. The three other resources are potentially subject to proximity impacts.

TABLE 3.8.1-1
SECTION 4(f) RESOURCES WITHIN THE GENERALIZED STUDY AREA

Name	Owner	Facilities
Alkire Park	City of Phoenix	Grills, playground, ramada and picnic area, softball
ASU-Karsten Golf Course	Arizona State University	Public golf course
Barrios Unidos Park	City of Phoenix	Amphitheater, basketball, volleyball, tennis courts, picnic facilities, soccer, and playground
Birchett Park	City of Tempe	Open space
Bolin Memorial Park	State of Arizona	Open Space
Canal Park	City of Tempe	Lagoon, picnic ramada/table/grill, restrooms
Carnegie Library Park	City of Phoenix	Open space
Central Park[a]	City of Phoenix	Ballfield, basketball, picnic area, playground, recreation building, volleyball
Chavez Community School	Maricopa County	Gym, recreational activities organized by the City of Phoenix
Clark Park	City of Tempe	Baseball/softball/basketball, picnic ramada/tables/grills, restrooms, public outdoor pool (available May-Sept.), and recreation center
Creamery Park	City of Tempe	Off-leash activity area, basketball court, picnic ramadas/tables/grills, playground equipment
Eastlake Park	City of Phoenix	Amphitheater, basketball, volleyball, and tennis courts, gymnasium, picnic facilities, pool, soccer and baseball fields, and restrooms
Grant Park	City of Phoenix	Basketball, gymnasium, picnic area, playfield, pool, recreation building
Green Valley Park	City of Phoenix	Basketball, playground, picnic area, soccer, softball, volleyball
Hayden Butte Park	City of Tempe	Playground, ramada, and picnic area, soccer, softball, volleyball
Heritage Square/Science Park	City of Phoenix	Historic homes, museum, carriage houses, machine shop
Hudson Park	City of Tempe	Basketball court, picnic tables/grills, restrooms
Indian Bend Park	City of Tempe	Basketball court, picnic tables/grills, tennis courts
Jaycee Park	City of Tempe	Baseball/softball fields, basketball court, picnic ramadas/tables/grills, playground equipment, restrooms, soccer fields, volleyball courts, off-leash activity area, multi-generational center, and water play structure
Lewis Park	City of Phoenix	Basketball, play area, picnic area, playground
Moeur Park	City of Tempe	Picnic tables/grills
Mitchell Park	City of Tempe	Baseball and Softball Fields, Basketball, Play Equipment, Soccer, Volleyball
New School	City of Tempe	School construction underway
Nuestro Park	City of Phoenix	Basketball, playfield, picnic area
Papago Park [a]	City of Tempe	Ramadas, picnic facilities, lake, lagoon, lighted ballfield, playground equipment, nature trails, natural desert terrain, volley courts, and restrooms, rolling hills golf course
Patriots Square Park	City of Phoenix	Seating areas, amphitheater; and food kiosks
Pueblo Grande Museum and Archaeological Park	City of Phoenix	Interpretative trails, exhibits, workshops, tours, museum, hands-on exhibits, event and meeting facilities
Rio Salado Park	City of Tempe	Boating, fishing, biking and walking trails, public art, and picnic facilities. Two automobile bridges (one historic) and one historic railroad bridge. There are walkways on the automobile bridges
Scales Elementary School	City of Tempe	Open field and playground equipment
Silveste S. Herrera Elementary School	County of Maricopa	Ballfields can be used with the proper forms completed and submitted to the district
Tempe Beach Park[a]	City of Tempe	Lighted ballfield, basketball court, picnic areas, community arts center, public arts sculpture area, playground, and restrooms
Tempe Women's Club Park	City of Tempe	Picnic tables/grills, play equipment
University Park	City of Phoenix	Recreation center; basketball, picnic area; playground; pool; ramada and picnic area; volleyball

[a] Received Land and Water Conservation Funds.
n/a = not available.
Source: Arizona State Parks (LWCF Coordinator).
http://www.tempeparks.com/map.htm
http://www.ci.phoenix.az.us/PARKS/parks.htm



Sources:
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-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

LEGEND

Potential Section 4(f) Resources
- School
- Park
- Historic Resource
- Park/Historic Resource

Other Features
- Area of Disturbance
- Area of Potential Visual Effect
- Generalized Study Area
- Water Features

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Scale: 1" = 4000'

NOTE: Individual Section 106 sites are not included

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
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Potential Section 4(f) Resources

FIGURE
3.8.1-1

c:\ 516\gc\c1 375-GIS Data 2\GC\Phoenix_eis\Applications\arcview_eis_2.apr\Figure 3.8.1-1 Potential Section 4(f) Resources (w/TIF image)_mxd_rev_12/14/05

TABLE 3.8.1-2
SECTION 4(f) HISTORIC RESOURCES WITHIN THE AREA OF POTENTIAL EFFECT

	Name	Location	Construction Year	Status
Within the Area of Potential Effects for Construction Impacts				
1	*The Phoenix,* a mural by Paul Coze	2908 E. Sky Harbor Blvd., in Terminal 2 lobby	1962	National Register eligible, Criterion C
2	Phoenix Main Line of Southern Pacific Railroad (now Union Pacific)	South of Jackson St. Stage 2 - East APM corridor	1924-1926	National Register eligible, Criterion A
3	Grand Canal	South of Washington St., Stage 2 - East APM corridor	1878	National Register eligible, Criterion A
Within the Area of Potential Effects for Visual Impacts				
4	Sacred Heart Church	900 S. 17th St., northwestern part of airport	1956	National Register eligible, Criterion A
5	Pueblo Grande Museum and Archaeological Park	4619 E. Washington St., east of Stage 2 - East APM corridor	Prehistoric ruin	National Historic Landmark, National Register listed, Criteria A and D; eligible, Criterion C; city register and city park
6	Tovrea Castle (El Castillo)	5041 E. Van Buren St., about 1 mile northeast of Stage 2 - East APM corridor	1928-1930	National Register listed, Criteria A and C, Phoenix Register and Historic Landmark

Source: City of Phoenix Aviation Department files; SHPO files.

The Phoenix, a mural by Paul Coze, is evaluated as a historical art object eligible for the National Register of Historic Places under Criterion C. The mural, which is owned by the City of Phoenix, is installed in the lobby of Terminal 2. The Stage 2 - East APM corridor crosses two historical structures. The APM would be elevated over the Grand Canal, which is part of a historical irrigation system that continues to be operated by the Salt River Project. The APM would run beneath the Phoenix main line of the Southern Pacific Railroad, within the right-of-way of the Sky Harbor Expressway and passing under the bridge that carries the railroad over the depressed Sky Harbor Expressway. The Phoenix main line was completed in 1926 and continues to be operated by the Union Pacific Railroad. The canal and railroad both are considered eligible for the National Register under Criterion A for their association with the history of settlement and development of the Salt River Valley and southern Arizona.

The Sacred Heart Church is a historical building considered eligible for the National Register under Criterion A. The abandoned church is located in the northwest corner of the airport. The Pueblo Grande Ruin and Irrigation Sites National Historic Landmark, within the Pueblo Grande Museum and Archaeological Park, is located east of the Stage 2 - East APM corridor on the opposite side of the Sky Harbor Expressway. The Pueblo Grande Ruin is listed in the National Register under Criteria A and D for its potential to yield important information about the prehistory of the region and association with the development of irrigation during the prehistoric and early historic eras. The SHPO also considers the ruins of the platform mound and surrounding residential compound at the site to be eligible under Criterion C. The Tovrea Castle is a four-story, folk-art tower built between 1928 and 1930 that is listed in the National Register under Criteria A and C, for its association with the history of resort and residential

development in Phoenix and unusual architectural style and surrounding cactus garden. The property also is listed in the City of Phoenix Register, designated as a Phoenix Historic Landmark, and has been acquired by the City and is being developed for heritage tourism. These three historic resources are subject to potential visual impacts by the elevated components of the Stage 2 APM and the APM maintenance and control facility.

Six other significant archaeological resources also were identified within the Area of Disturbance (AOD) (**Table 3.8.1-3**). Three of the resources are buried remnants of irrigation canals. Nineteen prehistoric Hohokam irrigation canals and the historic-age Joint Head Canal were documented [at sites AZ U:9:2(ASM) and AZ U:9:28(ASM)] just to the northeast of the airport when the Sky Harbor Expressway was constructed. Approximately seven other canal segments within what are known as the Hohokam Canal Systems 2 and 10 were identified between the 1920s and 1960s when they could still be traced on the surface of the ground. These canals were plotted within the area defined as the AOD on the airport, but their locations are only imprecisely mapped. The three other sites are Hohokam habitation areas. The Dutch Canal Ruin and Pueblo Salado are on the airport, and part of the Pueblo Grande site, outside the Pueblo Grande Museum and Archaeological Park, is northeast of the airport. All six of these archaeological resources are masked by modern development and their boundaries and conditions are unknown, but all could be disturbed by construction activities.

TABLE 3.8.1-3
ARCHAEOLOGICAL SITES EVALUATED AS POTENTIAL SECTION 4(f) RESOURCES

Site Name/Number		Location	Description	National Register Status	Potential Effect
1	Pueblo Salado AZ T:12:47(ASM)	Southwest Part of the Airport	Hohokam habitation site, Classic period, pit houses, adobe compounds, field houses, canals, pits, burials	Eligible, Criterion D. Data recovery studies conducted for prior projects.	Stage 2 - West APM may disturb part of site
2	Dutch Canal Ruin AZ T:12:62(ASM)	Northwest Part of the Airport	Hohokam (mostly seasonal) habitation site, pre-Classic and Classic periods, pit houses, canals, pits, burials	Eligible, Criterion D. Data recovery studies conducted for prior projects.	Sky Harbor Boulevard realignment may disturb part of site
3	Pueblo Grande AZ U:9:1(ASM)	Northeast of the Airport	Primary Hohokam village with ballcourts and platform mound, many habitation and burial areas, canals, pits	National Historic Landmark, listed Criteria A and D, part outside city park eligible, Criterion D. Data recovery studies conducted for prior projects outside the city park..	Stage 2 - East APM may disturb western edge of site outside the city park.
4	AZ U:9:2(ASM)	Northeast of the Airport	11 Hohokam canals, Sedentary and Classic periods, 1884 Joint Head Canal	Eligible, Criterion D. Data recovery studies conducted for prior projects.	Stage 2- East APM may disturb buried canal remnants that extend west of site
5	AZ U:9:28(ASM)	Northeast of the Airport	8 Hohokam canals, Sedentary and Classic periods, 2 activity areas, 3 historical trash pits	Data recovery studies conducted for prior projects.	Stage 2 - East APM may disturb buried canal remnants that extend west of site
6	Hohokam Canal Systems 2 and 10	Airport and Vicinity	Hohokam irrigation canals	Intact segments likely to be eligible, Criterion D	Construction may disturb buried canal remnants

Sources: See references cited in **Table 1, Appendix C**.

If archaeological sites are important primarily for important information that can be recovered and preserved through studies, they are not Section 4(f) resources but if they have significant features that warrant preservation in place, they are Section 4(f) resources (FAA Order 1050.1E, Environmental Impacts: Policies and Procedures, Appendix A, Section 6.2h). Prior projects have disturbed and destroyed parts of each of the six identified archaeological resources and data recovery studies have been implemented to collect and preserve information from those sites. In the course of those studies, human remains have been found, recovered, documented, and repatriated in accordance with the Arizona Antiquities Act and Arizona Burial Law. Although affiliated tribes prefer that human remains associated with archaeological sites not be disturbed, the data recovery studies and repatriation of human remains have been found to be acceptable treatment. In consultation with SHPO, FAA has determined that the six known archaeological resources within the AOD, and any other sites of similar type that might be discovered during project implementation, are important chiefly for their information content and therefore are not Section 4(f) resources.

3.8.2 SECTION 6(f) RESOURCES

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965, as amended, and codified at 16 U.S. Code, Section 4601-8(f)(3), requires that all properties receiving LWCF assistance for planning, acquisition, or development be permanently maintained for public outdoor recreation use. The Act requires, in part, that: "No property acquired or developed with assistance under this section shall, without the approval of the Secretary (of the Interior), be converted to other than public outdoor recreation uses." The City of Phoenix and the City of Tempe have acquired or developed three parks within the GSA using Land and Water Conservation funds. These parks, identified in **Table 3.8.1-1**, include Central Park (City of Phoenix), Papago Park, and Tempe Beach Park (both City of Tempe resources). Central Park includes areas of activity for baseball, volleyball, and basketball as well as a playground and picnic area. Papago Park includes picnic areas, playground, nature trails, and other recreational activities. Tempe Beach Park facilities include lighted ballfields, basketball, playground, and community arts center. Both Section 4(f) and 6(f) apply to these three parks.

3.9 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

3.9.1 STATUTORY REQUIREMENTS

NEPA requires Federal agencies work to preserve not only natural resources but also important historical and cultural aspects of our national heritage [Section 101(b)(4), 42 USC 4331(b)(4)]. FAA also must comply with Section 106 of the National Historical Preservation Act by considering the effects of the agency's undertakings on historic properties in consultation with the SHPO and other interested parties. Historic properties are defined as resources listed in or eligible for listing in the National Register of Historic Places (National Register). The National Park Service administers the National Register and has defined criteria for listing properties of national, state, or local significance, as follows:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) that are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded, or may be likely to yield, information important to prehistory or history (Title 36, Code of Federal Regulations, Part 60).

Unless historical and cultural resources have exceptional significance, they must be at least 50 years old to be considered for inclusion in the National Register. The authority to formally list properties is vested with the Keeper of the National Register, but under the framework of the Section 106 process, the lead Federal agency (FAA for this project) and the SHPO can agree to treat properties as eligible or ineligible.

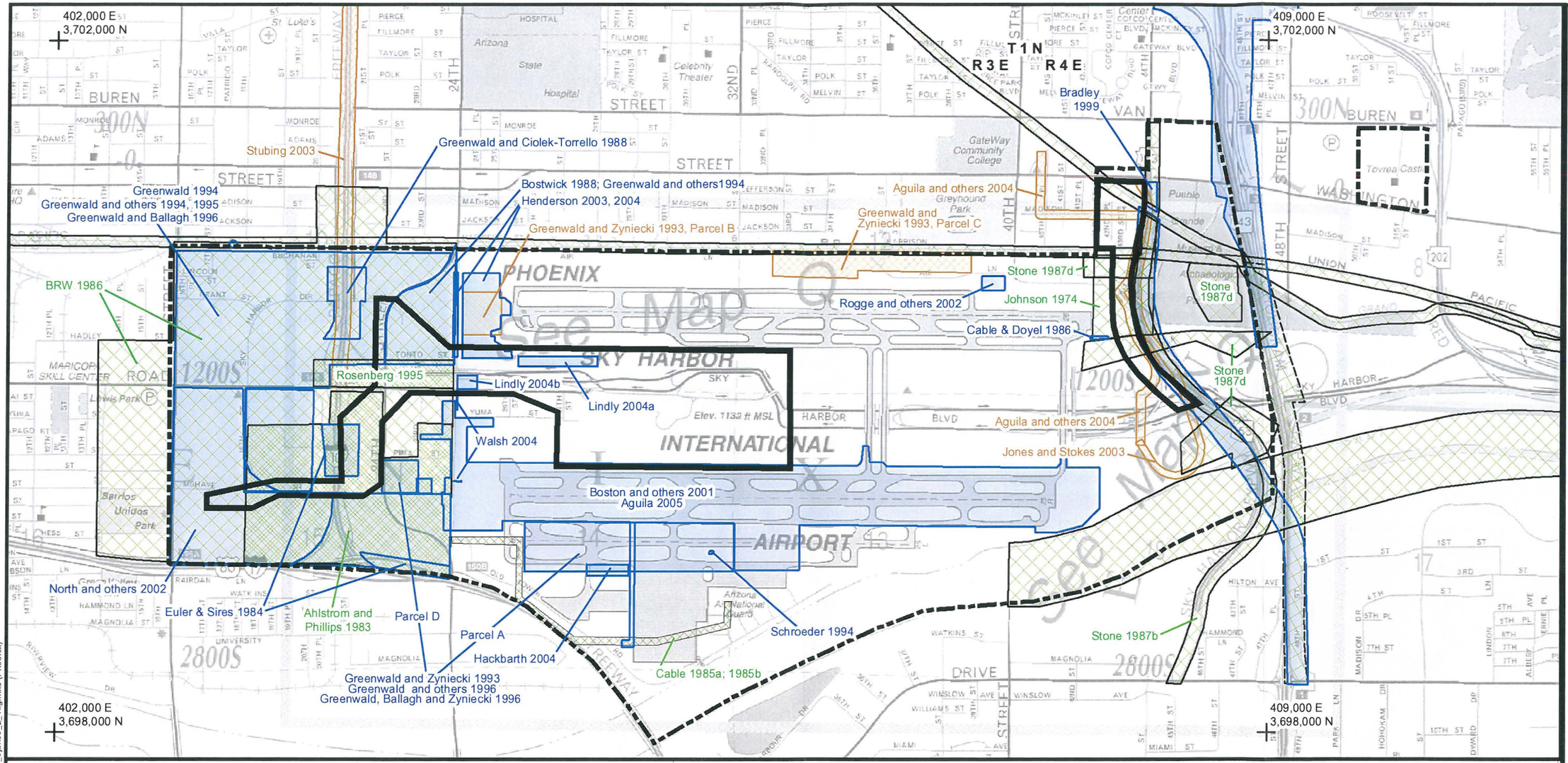
Types of resources addressed in this EIS include National Register-listed or eligible archaeological sites, potential traditional cultural resources, and historic buildings and structures. The resources potentially subject to effects from the alternatives are described in this section. Additional information is provided in a supplemental technical report (see **Appendix C**).

Section 4(f) of the U.S. Department of Transportation Act (Title 49, U.S. Code, Section 303[c]) also provides protection for some types of historic properties. Those resources are discussed in **Section 3.6**.

3.9.2 TYPES AND AREA OF POTENTIAL EFFECTS

Regulations for Protection of Historic Properties (Title 36, Code of Federal Regulations, Part 800.16[d]), which implement the National Historic Preservation Act, define the area of potential effects of a federal undertaking as the geographic area or areas within which the undertaking may directly and/or indirectly cause alterations in the character or use of historic properties, if present. The proposed project could result in two types of such alterations resulting from: 1) ground disturbance or demolition associated with construction of the proposed project, and 2) visual changes to the settings of historic properties. The area of potential effects for both types of impacts was delineated in consultation with the SHPO.

The area of potential effects for direct construction impacts was defined as the Area of Disturbance (AOD), which was delineated to facilitate analysis of direct ground disturbance and demolition impacts on all resources (refer to **Figure 3.9.2-1**). The defined AOD encompasses approximately 432 acres, including approximately 372 acres for the ADP Alternative on the airport, and approximately 60 acres for the segment of the Stage 2 - East APM off the airport. Not all of this area might actually be physically disturbed.



LEGEND

- Survey Project
- Testing / Excavation Project
- Records Review
- Area of Disturbance / Area of Potential Effects for Construction Impacts
- Area of Potential Effects for Visual Impacts

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Scale: 1" = 2,000'

Base Map Source:
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Sources: See references cited in Table 1, Appendix C

Phoenix Sky Harbor INTERNATIONAL AIRPORT
Environmental Impact Statement

Prior Cultural Resource Studies

FIGURE 3.9.2-1

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For those elements of the proposed project on airport property, the area of potential effects for visual impacts was defined as the airport property between 16th Street and the Hohokam Expressway (SR 143) on the west and east, respectively, and between the Union Pacific Railroad on the north and the Salt River and I-10 on the south (**Figure 3.9.2-1**). For the segment of the Stage 2 - East APM beyond the airport boundaries, the area of potential effects for visual impacts was defined as an area extending north from the airport boundary between 42nd Street and the Hohokam Expressway (SR 143), and encompassing the first row of parcels north of Washington Street between 42nd Street and 44th Street and extending farther north to Van Buren Street between 44th Street and the Hohokam Expressway. The noncontiguous Tovrea Castle property, located east of the Hohokam Expressway, also was included in the area of potential effects for visual impacts because this National Register-listed property is situated on a prominent hill (refer to **Figure 3.9.2-1**).

3.9.3 ARCHAEOLOGICAL RESOURCES

The characterization of archaeological resources within the area of potential effects was based on review of several prior studies (The review of prior studies included, but was not limited to, Abbot, 2003; Greenwald, 1994; Greenwald and Ballagh, 1996; Greenwald, Ballagh, and Zyniecki, 1996; Greenwald et al., 1994, 1995, 1996; and Masse, 1976. A complete listing of studies reviewed as part of this study and the study findings are presented in the "Historical, Archaeological, and Traditional Cultural Resources Technical Report" which is provided in **Appendix C** of this FEIS). No archaeological field surveys were conducted because the AOD is so highly modified and developed and virtually no natural ground surface is visible. Prior archaeological surveys, testing projects, and data recovery excavations within parts of the AOD and adjacent areas demonstrate that archaeological resources can remain partially intact beneath modern development. These studies provide substantial information for characterizing archaeological resources and assessing impacts (refer to **Appendix C**). The continuing inventory, evaluation, and consideration of archaeological resources will follow procedures defined by a Section 106 Memorandum of Agreement between the FAA, City of Phoenix, Bureau of Reclamation, Salt River Project, and SHPO that addresses modifications at the airport (refer to **Appendix C**).

Six archaeological resources might extend into the AOD (**Table 3.9.3-1** and **Figure 3.9.3-1**). These include three large habitation sites of the prehistoric Hohokam culture. The other resources are buried remnants of Hohokam or early historic-era irrigation canals. The Hohokam occupied much of central and southern Arizona for about a millennium from at least A.D. 500 to about 1450. The first Spanish explorers found the Hohokam villages abandoned when they began establishing missions in southern Arizona about two and one-half centuries later.

Pueblo Salado was a farming village occupied for about 300 years at the end of the Hohokam occupation. One feature excavated at the site may be the remnants of a much later Pima house, used during the A.D. 1600s or early 1700s. The site is eligible for the National Register for its potential to yield important information (Criterion D). Data recovery studies have been conducted across much of Pueblo Salado, but part of the site within the Stage 2 - West APM corridor has not been archaeologically tested. Buried archaeological features that were not detected during earlier investigations of the site could be present in this area.

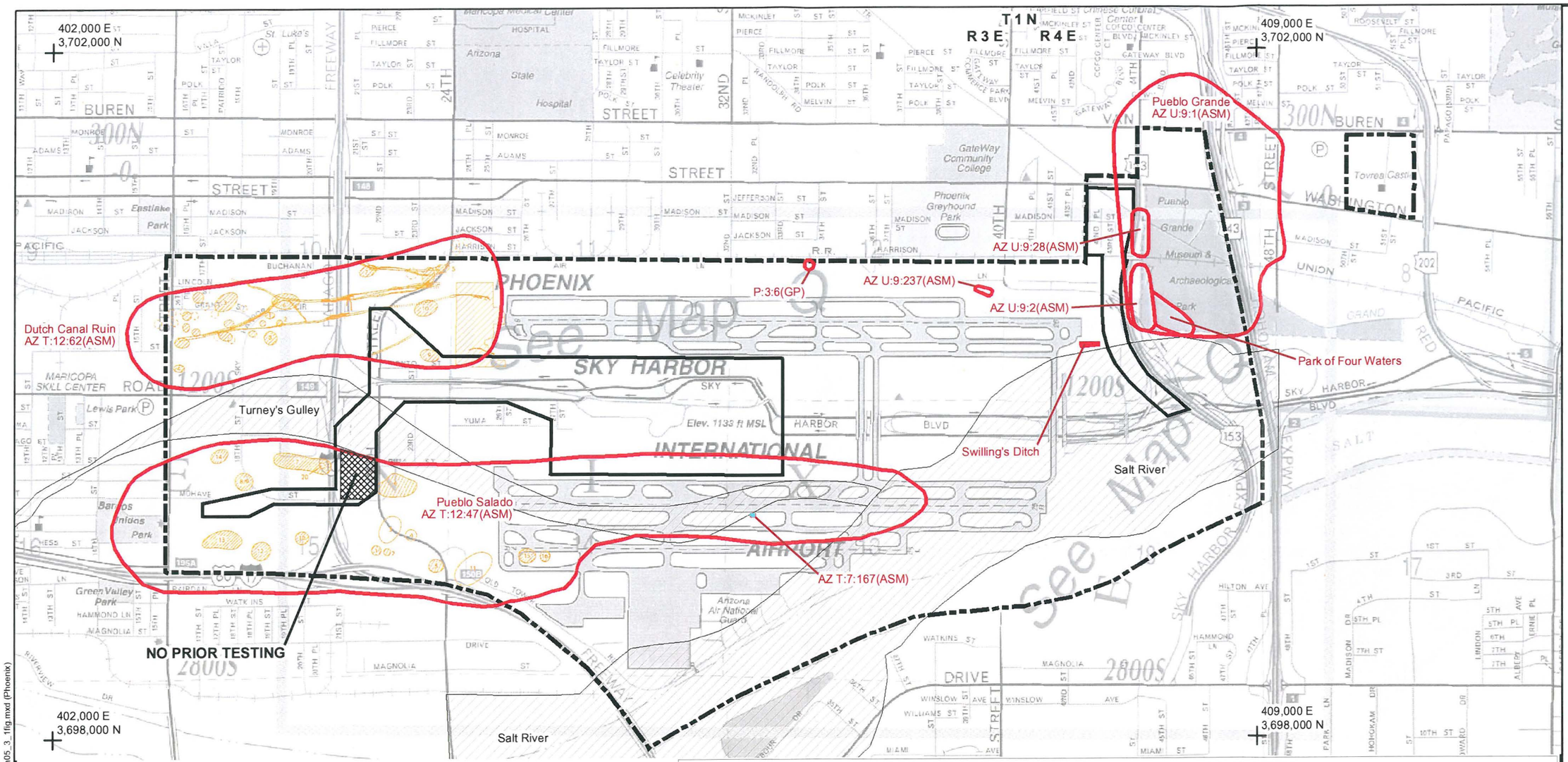
TABLE 3.9.3-1
ARCHAEOLOGICAL SITES WITHIN THE AREA OF DISTURBANCE

Site Name/Number		Location	Description	National Register Status[1]
1	Pueblo Salado AZ T:12:47(ASM)	Southwest Part of the Airport	Hohokam habitation site, Classic period, pit houses, adobe compounds, field houses, canals, pits, burials	Eligible, Criterion D
2	Dutch Canal Ruin AZ T:12:62(ASM)	Northwest Part of the Airport	Hohokam (mostly seasonal) habitation site, pre-Classic and Classic periods, pit houses, canals, pits, burials	Eligible, Criterion D
3	Pueblo Grande AZ U:9:1(ASM)	Northeast of the Airport	Primary Hohokam village with ballcourts and platform mound, many habitation and burial areas, canals, pits	Part outside city park eligible, Criterion D; inside park listed, Criteria A and D, eligible, Criterion C; National Historic Landmark
4	AZ U:9:2(ASM)	Northeast of the Airport	11 Hohokam canals, Sedentary and Classic periods, 1884 Joint Head Canal	Eligible, Criterion D
5	AZ U:9:28(ASM)	Northeast of the Airport	8 Hohokam canals, Sedentary and Classic periods, 2 activity areas, 3 historical trash pits	Eligible, Criterion D
6	Hohokam Canal Systems 2 and 10	Airport and Vicinity	Hohokam irrigation canals	Intact segments likely to be eligible, Criterion D

[1] These are consensus determinations made by the FAA in consultation with the SHPO; refer to Section 3.9.1 for definition of criteria.
Sources: See references cited in Table 1, Appendix C.

The Dutch Canal Ruin was primarily a farming area that was seasonally occupied for almost the entire period of Hohokam occupation of the Phoenix Basin. The site is eligible for the National Register for its potential to yield important information (Criterion D). Data recovery studies have been conducted across most of the Dutch Canal Ruin to mitigate the impacts of prior projects. The limits of the site are not precisely defined, but the site could extend into the corridor of Sky Harbor Boulevard that would be modified by the ADP Alternative.

Pueblo Grande is a large primary village situated at the headings of the Hohokam Canal System 2. Features interpreted as ballcourts and platform mounds used for ceremonies or residences for community leaders identify the most important settlements within the area occupied by the Hohokam. The multiple ballcourts and platform mound at Pueblo Grande, which is one of the largest documented, attest to the importance of this village. The core of the site is preserved within the Pueblo Grande Museum and Archaeological Park (park), and the National Park Service has designated part of the site within the archaeological park as the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark (landmark). The portion of the site within the park and landmark is listed in the National Register under Criteria A and D. The National Register nomination identified the site's eligibility under Criterion A as due to its association with the development of prehistoric and early historic-era irrigation. The SHPO also considers the site to be historically important for its association with the history of Phoenix because it was the first archaeological site set aside as a city park, for its importance in the history of Southwestern archaeology, and as a place of importance in the history of several Indian tribes. The SHPO also considers the architectural ruins of the site to be eligible under Criterion C because they embody the distinctive characteristics of a type of aboriginal construction. The part of the site within the park is listed in the National Register under Criterion D for having yielded important information and for its potential to yield additional important information. The part of the site outside the park is considered eligible under Criterion D.



LEGEND

- Site
- Artifact / Feature Clusters or Data Recovery Studies Completed
- Flood Scour Zone and Erosional Channel (location approximate)
- Area of Disturbance / Area of Potential Effects for Construction Impacts
- Area of Potential Effects for Visual Impacts

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Scale: 1" = 2,000'

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Sources: See references cited in Table 1, Appendix C

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Previously Recorded Archaeological Sites

FIGURE
3.9.3-1

P:\COP_AviationWest_Terminal_ES\gis\mxds\culturalEIS_Prior_Sites_MAP_76jan05_3_1fig.mxd (Phoenix)

The park is outside the AOD, but the archaeological site extends well beyond the park boundaries. How far the site might extend to the west of the park boundary into the Stage 2 - East APM corridor is unknown. Available evidence indicates that Hohokam canals are more likely to be present west of the park than habitation and burial areas. Studies at sites AZ U:9:2 and 28(ASM) along the western margin of the archaeological park documented 19 Hohokam canals, as well as the historical Joint Head Canal. These sites are considered eligible for the National Register for their potential to yield important information (Criterion D). Many of the canals at these sites are likely to extend into the corridor of the Stage 2 - East APM corridor.

The entire airport and adjacent areas are located within fields formerly farmed by the Hohokam, and other unrecorded irrigation canals could be present. Maps based primarily on observations made during the first half of the twentieth century prior to urban development indicate that main canals called Canal Patricio (the southernmost major canal of Canal System 2), and Canal Salado (Canal System 10) crossed the area. Ongoing investigations in conjunction with construction of improvements to the Center Runway have documented numerous archaeological features related to the fields that probably were farmed by the inhabitants of Pueblo Salado. Unless prior construction or erosion has disturbed sediments below a depth of 4 to 5 feet, similar features might be found within the AOD even though archaeological sites have not been recorded in those areas.

Additional inventory and evaluation of archaeological resources would be pursued through archaeological monitoring or test excavations during pre-construction efforts including, preparation of final design when more details of the proposed project become available. Any intact archaeological deposits are likely to be evaluated as eligible for the National Register for their potential to yield important information about the history of Hohokam or early Euro-American settlement systems and subsistence strategies (Criterion D). The continuing inventory, evaluation, and consideration of archaeological resources will follow procedures defined by the Section 106 Memorandum of Agreement (refer to **Appendix C**).

3.9.4 TRADITIONAL CULTURAL RESOURCES

Traditional cultural resources have significance for present-day traditional cultural groups, such as American Indian communities with traditional cultural affiliations with the Salt River Valley. The FAA contacted the leaders and cultural preservation offices of four tribal communities (Salt River Pima-Maricopa Indian Community, Gila River Indian Community, Fort McDowell Yavapai Nation, and Hopi Tribe), and provided them with information about the project (see **Appendix A** of this FEIS). These consultations were conducted in a government-to-government manner pursuant to Executive Order 13175, Consultation and Coordination with Indian Tribal Governments. The tribes were offered an opportunity to provide information about cultural resources that may have traditional cultural values for their communities and to express their concerns about impacts on such places.

The Hopi Tribe confirmed their cultural affiliation with prehistoric groups in the Phoenix area. Although other groups did not formally respond, they all are known to have concerns about the treatment of human remains, funerary objects, sacred objects, and objects of cultural patrimony that may be buried in archaeological sites within the AOD. Any human remains and funerary objects, sacred objects, and objects of cultural patrimony would be treated in accordance with an agreement that the Arizona State Museum, City of Phoenix, and tribes having traditional cultural affiliations with the Phoenix area have executed in compliance with the Arizona Antiquities Act.

On March 11, 2005, the FAA transmitted copies of the cultural resources report entitled "*Historical, Archaeological, and Traditional Cultural Resources Report*" to the tribal communities. The FAA transmittal requested that any comments on the report, or the proposed project at PHX, be transmitted to the FAA for consideration. No comments were received. On April 8, 2005, the FAA contacted representatives of the Fort McDowell Yavapai Nation to solicit any comments they might have on the project or report. Yavapai Nation representatives indicated they received the report and had no comments. The Gila River Indian Community was contacted on April 26, 2005 to solicit their comments on the project and report. Gila River representatives indicated they had no comments on the project or report at this time. Records of these telephone conversations are provided in Appendix A. Attempts to reach representatives of the remaining tribes have been as yet unsuccessful. Efforts to contact their representatives are ongoing.

3.9.5 HISTORIC BUILDINGS AND STRUCTURES

Advertising itself as the "Rainbow Route Across the Grand Canyon," Scenic Airlines established Sky Harbor Airport in 1928 to provide tourism services in the Southwest. Financial difficulties at the onset of the Great Depression forced Scenic Airlines to sell Sky Harbor to a group of investors, who then sold the airport to the City of Phoenix in 1935. During World War II, Sky Harbor was used as a pilot training facility and the U.S. Army built improvements. After the war, airport traffic increased as the local population grew dramatically and, in 1948, Sky Harbor was declared the busiest airport in the nation.

By 1952, a new terminal (subsequently known as the West Terminal and later Terminal 1) was completed, and a new state-of-the-art air traffic control tower was built. Federal funding provided in 1956 allowed the airport to purchase property to expand the clear zone, construct new support buildings, and extend taxiways. In 1962, the East Terminal (later designated Terminal 2) was completed. In the late 1960s and 1970s, Sky Harbor continued to expand, and a parking lot with capacity for 400 vehicles opened opposite the East Terminal in 1965. After an international terminal was built east of the East Terminal in 1972, Sky Harbor was renamed Phoenix Sky Harbor International Airport. In the mid-1970s, the Aviation Department embarked on a new capital improvements program that included a new terminal, renovation of the East Terminal, a new control tower, new fire station, taxiways, and a property acquisition and relocation program to expand clear zones west of the airport. In the 1980s, continued growth led to expansion of Terminal 3 from 16 to 26 gates, and the Barry M. Goldwater Terminal 4 was completed in 1990. One year later, a new international concourse opened in Terminal 4, and the original international terminal was converted to an Airport Operations Center, and Terminal 1 was closed and demolished.

Construction of the proposed project would involve the phased demolition of existing buildings through the year 2015, at which time any buildings constructed in 1965 or earlier would be 50 years old and would meet the age requirement for National Register consideration. Therefore, historic-age buildings and structures were defined for the purposes of this project as having been built in 1965 or earlier. Review of County Assessor records, airport files, and other documentation identified 21 historic-age buildings and structures and one object within the AOD (Table 3.9.5-1). The significance of these 22 historic age buildings, structures, and object was evaluated in conjunction with the SHPO using criteria for listing in the National Register.

TABLE 3.9.5-1
HISTORIC-AGE BUILDINGS, STRUCTURES, AND OBJECTS WITHIN THE APE AREA OF DISTURBANCE

	Name/Parcel Number	Location	Construction Date	National Register Status/ Criteria[1]
1	FAA/TRACON Building (121-56-001)	2801 E. Sky Harbor Blvd.	1958, modified 1996, 1997	To be demolished in 2005 by separate project; not evaluated
2	Aviation Department (121-52-058)	Southwest corner of Buckeye Road and 25th Pl.	1965-1966	Ineligible
3	Dynair Fueling Maintenance Shop (121-49-002A)	South of parking area west of Terminal 2	ca. 1955-1960	Ineligible
4	American Airlines Maintenance Shop (121-49-002A)	South of parking area west of Terminal 2	ca. 1964-1965	Ineligible
5	Delta Maintenance Shop (121-49-002A)	South of parking area west of Terminal 2	ca. 1965-1968	Ineligible
6	Delta Maintenance Shop (121-49-002A)	South of parking area west of Terminal 2	ca. 1965-1968	Ineligible
7	Terminal 2 (formerly East Terminal)	2908 East Sky Harbor Blvd.	1962	Ineligible
8	Paul Coze Mural in Terminal 2	2908 East Sky Harbor Blvd.	1962	Eligible, Criterion C
9	Union Pacific Railroad (originally Phoenix main line of Southern Pacific Railroad)	South of Jackson St.	1924-1926	Eligible, Criterion A
10	Grand Canal	South of Washington St.	1878	Eligible, Criterion A
11	Arizona Aerosol Corporation Chemical (124-06-001)	15 S. 42nd St.	1965	Ineligible
12	Valley National Bank / Bell Paint and Body Shop (124-06-002)	17 S. 42nd St.	late 1940s; moved to current location in the late 1950s; modified in 1973	Ineligible
13	Building on Parcel 124-06-003	23 S. 42nd St.	1960	Ineligible
14	Colonial Duntex Tile Contractor (124-06-004)	27 S. 42nd St.	1959	Ineligible
15	Building on Parcel 124-06-006	55 S. 42nd St.	late 1950s	Ineligible
16	Building on Parcel 124-06-008	26 S. 42nd Pl.	1939; moved to current location in the late 1950s	Ineligible
17	Stewart Concrete & Pipe (124-06-022)	4218 E. Madison St.	1965	Ineligible
18	Building on Parcel 124-06-23B	31 S. 42nd Pl.	1960	Ineligible
19	Building on Parcel 124-06-024B	37 S. 42nd Pl.	1940s; moved to current location in the late 1950s	Ineligible
20	J.T. Richmond Tool & Die (124-06-037C)	4302 E. Madison St.	1961	Ineligible
21	Western Sealant Co. (124-06-042A)	4209 E. Madison St.	1960-1970	Ineligible
22	Parcel 124-06-059A	126 S. 42nd Pl.	1962	Ineligible

[1] These are consensus determinations made by the FAA in consultation with the SHPO; refer to Section 3.9.1 for definitions of criteria.

Sources: City of Phoenix Aviation Department Files; SHPO Files; Maricopa County Assessor Records.

Seven of the historic-age buildings and the historic-age object within the AOD are on airport property. The FAA/TRACON building will be demolished in 2005 in conjunction with an independent project, and therefore was not evaluated further. The Aviation Department (facilities and services) building, built between 1965 and 1966, originally was privately owned and housed a machining company called Mech-Tronics. The building has been modified and had several additions since its original construction, and has no significant associations or other historic values that make it eligible for the National Register.

Four of the buildings are maintenance shops located west of Terminal 2. The Dynair Fueling Maintenance Shop was built circa 1955-1960, and the American Airlines Maintenance Shop was built circa 1964-1965. The other two maintenance shops, occupied by Delta Air Lines, are adjacent to each other and were constructed circa 1965-1968. All four of these simple, utilitarian buildings have no significant associations or other historic values and are ineligible for the National Register.

The seventh historic-age building within the AOD on the airport is Terminal 2. When built in 1962, Terminal 2 was considered a state-of-the-art airport terminal and architecturally significant. However, the building has been substantially altered in conjunction with subsequent upgrades, and is not eligible for the National Register because it has lost its historic integrity.

A Paul Coze mural, titled *The Phoenix*, is a historic-age art object mounted in the lobby of Terminal 2. The three-paneled mural, consisting of moveable panels, depicts Phoenix's past, present, and future and was created by Paul Coze, a prominent local artist who won a design competition. The mural, which was installed in Terminal 2 when it was constructed in 1962, is considered eligible for the National Register under Criterion C.

One of the resources crossed by the Stage 2 - East APM corridor off the airport is the Union Pacific Railroad, which was built in 1924-1926 as the Phoenix main line of the Southern Pacific Railroad. The SHPO previously evaluated this railroad as eligible for the National Register under Criterion A.

The Stage 2 - East APM corridor also crosses the Grand Canal, which was originally constructed in 1878. The canal has been maintained and upgraded over the years, and continues to function as a major component of the modern irrigation network of the Salt River Project. Prior evaluation determined that the Salt River Project canal system is eligible for the National Register under Criterion A.

The twelve other buildings are located off of the airport within the AOD. These buildings are located within an area bounded by Washington Street on the north, the Union Pacific Railroad on the south, 42nd Street on the west, and Sky Harbor Expressway (SR 153) on the east. The properties would need to be acquired, removed, and 42nd Place and 43rd Street would be abandoned to accommodate the Stage 2 - East APM and APM maintenance and control facility. This area was part of the Portland Tract that was platted in 1923 for mixed residential, commercial, and industrial use. The Portland Tract was initially promoted as a planned community for African Americans, but only a few houses were ever built in this subdivision. An aerial photograph dating from about 1954 indicates that most of the Portland Tract was vacant, but was beginning to be developed for commercial and light industrial uses. All twelve of the historic-age buildings located within the AOD off the airport were either constructed or moved onto the property in the late 1950s and are not associated with the early history of the Portland Tract.

The Arizona Aerosol Corporation Chemical building was constructed in 1965 at 15 South 42nd Street. The concrete block building is an example of a common type of building in the area. This building has no significant associations or other historic values and is not eligible for the National Register. The Valley National Bank/Bell Paint and Body Shop building was constructed in the late 1940s, but was moved to its current location at 17 South 42nd Street in the late 1950s. The building is a Quonset hut that may have been originally used as one of the first drive-through banks in Phoenix. After it was moved, it was converted to an auto body shop. The drive thru window has been removed, an addition has been constructed on the back of the building, and modifications were completed to the building after a fire. The Quonset no longer possesses sufficient integrity to be eligible for the National Register.

Three additional historic-age buildings are located on the east side of 42nd Street. The building at 23 South 42nd Street (Parcel 124-06-003) is a small, utilitarian building constructed in 1960, and the Colonial Duntex Tile building at 27 South 42nd Street is a wood frame and metal building constructed in 1959. The building at 55 South 42nd Street (Parcel 124-06-006) is a wood frame and metal shed that was built in the late 1950s. All of these buildings appear to have been modified since their original construction, and none have significant associations or historic values that would make them eligible for the National Register.

Originally constructed in 1939, the building at 26 S. 42nd Place (Parcel 124-06-008) was not moved to its current location until the late 1950s. The combination office and warehouse building is no longer within its original context and has been modified since its construction. The Stewart Concrete and Pipe building, located at 4218 East Madison Street, was constructed on-site in 1965 by a tenant. The building was installed on piers so it could be moved. The building at 31 South 42nd Place (Parcel 124-06-23B) was constructed in 1960 and is a utilitarian, concrete block building. None of these buildings have significant associations or historic values that would make them eligible for the National Register.

The building located at 37 South 42nd Place (Parcel 124-06-024B) is a one-story, wood frame structure that was built in the 1940s, and moved to its current location in the late 1950s. The building appears to be a storehouse or company administration building constructed according to standard U.S. Army World War II vintage plans. This building is no longer in its original setting and has been modified for light industrial use. The building no longer represents its earlier history, and does not retain sufficient historic integrity to be eligible for the National Register.

The J.T. Richmond Tool and Die building is located at 4302 East Madison Street and was constructed in 1961. The building has multiple additions and is an example of a common type of commercial or light industrial building. The Western Sealant Building located at 4209 East Madison Street is a wood frame shed constructed circa 1960-1970. Neither of these buildings possesses significant associations or other historic values that would make them eligible for the National Register. County assessor records indicate that a building was constructed at 126 South 42nd Place (Parcel 124-06-059A) in 1962. If the building remains intact, it has been integrated into a modern building and is no longer visible. This building is not eligible for the National Register.

County Assessor records and airport files were reviewed to identify historic-age buildings and structures within the defined area of potential effects for visual impacts. Four additional historic-age properties were identified - two on the airport and two off the airport (**Table 3.9.5-2**). The Grand Canal and Phoenix main line of the Southern Pacific Railroad also extend from the area of potential effects for construction impacts into the area of potential effects for visual impacts.

TABLE 3.9.5-2
HISTORIC ERA BUILDINGS AND STRUCTURES
WITHIN THE AREA OF POTENTIAL VISUAL EFFECT

	Name	Location	Construction Date	National Register Status/ Criteria
1	Terminal 1 Traffic Control Tower (121-48-006)	2802 E. Old Tower Rd.	1952, moved and modified in 1991	Ineligible[1]
2	Sacred Heart Church	900 S. 17th St.	1956	Eligible, Criterion A[1]
3	Pueblo Grande Museum and Archaeological Park	4619 E. Washington St.	Prehistoric ruin	Listed, Criteria A and D, eligible, Criterion C; National Historic Landmark, city park and listed in Phoenix Register
4	Tovrea Castle (El Castillo)	5041 E. Van Buren St.	1928-1930	listed, Criteria A and C , listed in Phoenix Register, designated as Phoenix Historic Landmark, and being developed for heritage tourism

[1] These are consensus decisions made by the FAA in consultation with the SHPO; refer to **Section 3.9.1** for definition criteria.
Source: Airport files; SHPO files; CHPO files, Maricopa County Assessor Records.

The historic-age resources on the airport include the old airport control tower and the Sacred Heart Church. The old control tower was built near Terminal 1 in 1952, but was removed in 1991 when Terminal 1 was demolished. Part of the tower was re-erected near the southern edge of the airport. Because it has been moved from its original setting and modified, the tower does not retain sufficient historic integrity to be eligible for the National Register.

The Sacred Heart Church was constructed in 1956 within the Golden Gate Barrio, and had a significant role in the civic and religious life of one of the oldest barrios in southeast Phoenix. When the property was integrated into the airport, the Golden Gate Barrio was razed. Although the Sacred Heart Church was abandoned, it was left standing and remains an important historical icon of the former barrio. The setting of the church was drastically altered when the surrounding residential areas and street grid were removed, but prior evaluation by the SHPO concluded that the Sacred Heart Church is eligible for the National Register under Criterion A (refer to **Section 3.9.1**).

As discussed in **Section 3.9.3**, the Pueblo Grande Ruin National Historic Landmark within the City of Phoenix-owned Pueblo Grande Museum and Archaeological Park is located just east of the northern end of the Stage 2 - East APM corridor on the opposite side of the Sky Harbor Expressway (SR 153). The Pueblo Grande Ruin is listed in the National Register under Criteria A and D, and the SHPO considers the architectural ruins within the park also to be eligible under Criterion C (refer to **Section 3.9.1**).

Tovrea Castle and Carraro Cactus Garden, located at 5041 East Van Buren Street, was historically known as El Castillo. Built between 1928 and 1930 as a resort/real estate development venture, the structure is a four-story, octagonal folk-art tower, constructed in stepped tiers. The building and the surrounding 44-acre cactus garden are listed in the National Register under Criteria A and C (refer to **Section 3.9.1**). The property also is listed in the Phoenix Register and is designated as a Phoenix Historic Landmark. The City is developing the property as a heritage tourism attraction.

In summary, the inventory identified six historic-age resources listed in or eligible for listing in the National Register that are located within the area of potential effects (**Figure 3.9.5-1**). The Paul Coze Mural, Phoenix main line of the Southern Pacific Railroad, and the Grand Canal, are within the area of potential effects for construction impacts. The Sacred Heart Church, Pueblo Grande Ruins and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park, and the Tovrea Castle are within the area of potential effects for visual impacts. See **Section 3.9.3** for a discussion of archaeological resources on or eligible for the National Register for Historic Places. See **Section 4.11** for historic resource impacts of the No-Action Alternative and proposed project.

3.10 BIOTIC COMMUNITIES

3.10.1 LAND COVERAGES

The airport is in a broad alluvial plain that has been heavily modified by urban development and the airport. It is drained by the Salt River, which forms much of the southern boundary of the DSA and the airport. The DSA is highly modified, although several native plant communities have reestablished a presence at the site. The following seven land coverage classifications have been identified in the DSA:

- Airport-urban developed,
- Disturbed unvegetated,
- Disturbed vegetated,
- Riparian scrub,
- Riparian wetland,
- Stormwater wetland, and
- Sweetbush association.

Figure 3.10.1-1 identifies land coverage distributions within the DSA. The bed of the Salt River is the only area in the DSA that is comprised of a naturally occurring biotic community. The north and south banks of the Salt River have been stabilized with concrete banks and a low flow channel has been constructed within the river in the DSA along its southern bank. The Salt River is dry most of the year, but can experience significant water flow during monsoon or winter rainfall events. These flood events scour vegetation and redistribute soil and plant matter within the Salt River. In this regard, the riverbed communities are functioning in a natural manner as vegetation is cleared by flood action and revegetated where possible. Runoff water also enters the Salt River from a series of storm drains located along the banks of the river. Water not associated with storm events also flows through these drains. This water includes the combined discharge from the City of Phoenix WWTPs, as well as intermittent discharges from sources common to the urban environment. The influence of the urban setting is seen in the high number of non-native species in the riverbed.

The following is a discussion of each of the land cover types identified in the DSA.

Airport-Urban Development - This highly modified land use coverage type occupies the vast majority of the DSA. More specifically, current airport operations and facilities utilize approximately three-quarters of the southern portion of the property, while roads and industrial development occupy the remaining portion of the airport site at its northern boundary. Vegetation types in this particular land coverage classification consist of xeriscaping along highway rights-of-way and the airport grounds.

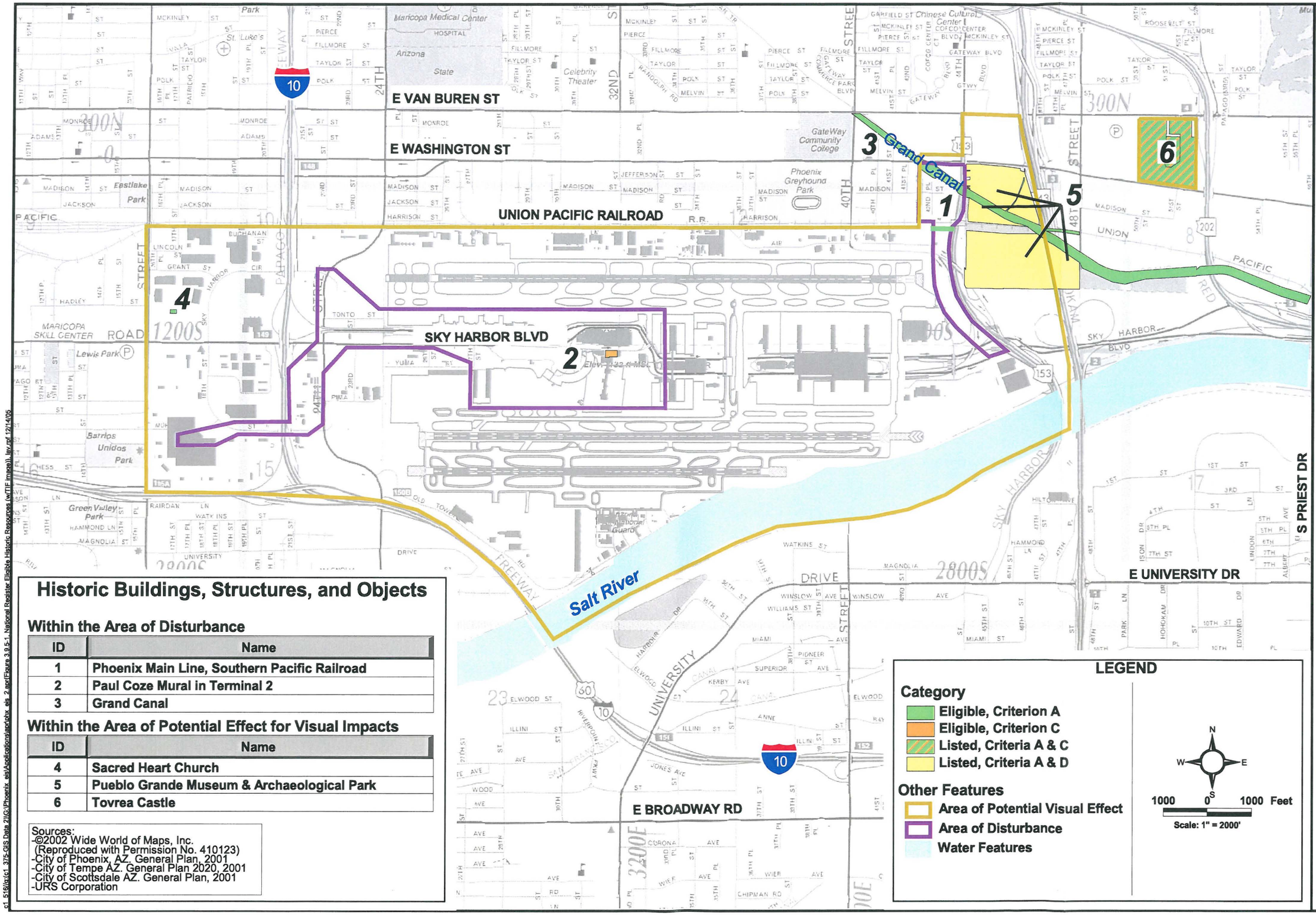
Disturbed Unvegetated - Areas south of the Salt River, west of 24th Street, and east of State Highway 153 have been cleared of all vegetation, and the topsoil has either been buried or removed. This modification has generally left these areas unsuitable for re-vegetation. There are however intermittent and random areas that include invasive and exotic species such as Russian thistle (*Salsola iberica*), common sunflower (*Helianthus annuus*), and velvet mesquite (*Prosopis veluntina*).

Disturbed Vegetated - The northeastern corner of the DSA has been cleared of much of its topsoil but many velvet mesquite remain. There are scattered invasive and exotic species such as globe mallow (*Sphaeralcea* spp.), Russian thistle, and common sunflower.

Riparian Scrub - The Salt River bed is primarily covered with large river rocks and gravel. Soil accumulates and seasonal floods heavily influence placement of such material. Grasses and fast growing shrubs such as sweetbush (*Bebbia juncea*) and desert broom (*Baccharis sarothroides*) have established along the Salt River bed. Longer-lived trees, including velvet mesquite, palo verde (*Cercidium microphyllum*), ironwood (*Olneya tesota*), white thorn acacia (*Acacia constricta*) and coyote willow (*Salix exigua*), are scattered along the edges of the bed of the Salt River and intermittently along upland areas. Salt cedar (*Tamarix pentandra*) also occurs throughout the bottom of the Salt River within the DSA, both as stand-alone plants and also as linear stands along the base of the bank of the river. Such trees are generally less than 10 feet tall.

Riparian Habitats - Three riparian wetlands have been identified within the DSA (refer to **Figure 3.10.1-1**). These particular vegetative communities are characterized as producing denser vegetation and a higher percentage of sandy soil within the Salt River bed. Riparian wetlands do not appear to be associated with stormwater runoff, but rather with the natural low flow channel identified along the bed of the Salt River. Grasses, including fountain grass (*Penisetum setaceum*) and Bermuda grass (*Cynodon dactylon*), sweetbush, and native trees (i.e., palo verde, velvet mesquite, and acacia) are also concentrated in these particular vegetative communities. Additionally, exotic species such as small fan palms (*Washintonia* sp.), pomegranate (*Punica granatum*), and eucalyptus (*Eucalyptus* sp.) also were identified in riparian wetland areas, and likely may have washed in from landscaped areas surrounding the river. Airport wetland communities are described in more detail in **Section 3.12**, Wetlands.

Stormwater Outfall Habitats - Rainwater falling on the airport and other asphalt surfaces bordering the Salt River is gathered by a stormwater drainage system and conveyed to the riverbed. This water enters the Salt River at several outlets located along the northern and southern banks of the river. Four of these outlets have discharged sufficient water to sustain a small habitat containing hydrophytic vegetation such as cattail (*Typha latifolia*), coyote willow (*Salix exigua*), and sedges (*Carex* sp.). Dense stands of upland species such as desert broom also are associated with these areas. Exotics associated with the identified stormwater habitats include fan palms, eucalyptus, salt cedar, bermuda grass, and lilac chaste tree (*Vitex agnus-castus*).



Historic Buildings, Structures, and Objects

Within the Area of Disturbance

ID	Name
1	Phoenix Main Line, Southern Pacific Railroad
2	Paul Coze Mural in Terminal 2
3	Grand Canal

Within the Area of Potential Effect for Visual Impacts

ID	Name
4	Sacred Heart Church
5	Pueblo Grande Museum & Archaeological Park
6	Tovrea Castle

Sources:
-©2002 Wide World of Maps, Inc.
(Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

LEGEND

Category
- Eligible, Criterion A
- Eligible, Criterion C
- Listed, Criteria A & C
- Listed, Criteria A & D

Other Features
- Area of Potential Visual Effect
- Area of Disturbance
- Water Features

N W E S
1000 0 1000 Feet
Scale: 1" = 2000'

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

National Register Eligible or Listed Historic Resources

FIGURE 3.9.5-1

c:_516\gis_375-GIS Data 2\IGs\Phoenix_eis\Applications\arcview_eis_2.apr\Figure 3.9.5-1 National Register Eligible Historic Resources (w/TIF images).mxd 12/14/05

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Biotic Communities within the Detailed Study Area

SKY HARBOR BLVD

E VAN BUREN ST

E WASHINGTON ST

E UNIVERSITY DR

E BROADWAY RD

Salt River

LEGEND

Biotic Communities
- Disturbed Unvegetated
- Disturbed Vegetated
- Riparian Scrub
- Riparian Habitats
- Stormwater Outfall Habitats
- Sweetbush Association
- Airport/Urban Development

Other Features
- Detailed Study Area
- Major Water Features

N W E S

1000 0 1000 2000 Feet

Scale: 1" = 2000'

Sources:
-©2002 Wide World of Maps, Inc. (Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

FIGURE 3.10.1-1

c1_516\cx\c1_375-GIS Data 2\IG\Phoenix_eis\Applications\aco\phx_eis_2.aor\Figure 3.10.1-1_Biotic Communities3_mpf_lav_12/14/05

A review of historical aerial photographs indicates that dense stands of perennial plants are occasionally removed by flood scouring. In more recent years, the airport has attempted to suppress vegetation along the northern boundary of the Salt River bed to discourage birds from gathering near the airport flight paths. This effort includes mechanical removal of dense vegetation and also channeling of water into a low flow canal to move standing water farther from the flightpath. Field reconnaissance revealed that vegetation at the stormwater outfalls along the north side of the Salt River is smaller (younger) or more restricted than on the south side of the riverbed.

Sweetbush Association - Sweetbush occurs throughout the bed of the Salt River. It also occurs in a nearly pure stand in the eastern section of the DSA. There are also scattered acacia and mesquite trees located in this particular area. A listing of vegetation species identified during field reconnaissance within the DSA is provided in Table 3.10.1-1.

TABLE 3.10.1-1
PLANT SPECIES RECORDED IN THE DETAILED STUDY AREA

Common Name	Scientific Name
Fountain grass*	*Penisetum setaceum*
Bermuda grass*	*Cynodon dactylon*
Common cat tail	*Typha latifolia*
Sacred datura	*Datura meteloides*
Arabian grass*	*Schismus arabicus*
Common Sunflower	*Helianthus annuus*
Russian thistle*	*Salsola iberica*
London rocket*	*Sisymbrium irio*
Catclaw acacia	*Acacia greggii*
Ironwood	*Olneya tesota*
Velvet mesquite	*Prosopis velutina*
Foothill paloverde	*Cercidium microphyllum*
Globe mallow*	*Sphaeralcea spp.*
Freemont cottonwood	*Populus fremontii*
Salt cedar*	*Tamarix pentandra*
Eucalyptus*	*Eucalyptus sp.*
White thorn acacia	*Acacia constricta*
Oleander*	*Nerium sp.*
Fan palm*	*Washingtonia sp.*
Pomegranate*	*Punica granatum*
Lilac Chaste tree*	*Vitex agnus-castus*
Coyote willow	*Salix exigua*
Sweetbush	*Bebbia juncea*
Sedges	*Carex sp*
Triangle-leaf bursage	*Ambrosia deltoidea*
Desert broom	*Baccharis sarothroides*

*Not native to Arizona.
Source: URS, 2002.

3.10.2 WILDLIFE

Wildlife Habitats - The DSA offers few resources to native wildlife. No undisturbed habitats exist in the DSA. Field reconnaissance indicated that limited wildlife species have adapted to the modified environments in the vicinity of the airport. The airport property and industrial areas provide food (e.g., refuse and seeds from ornamental plantings) for rodents and birds resulting from human-related activities. Many migrant bird species may use the Salt River as a corridor to move through the urban environment as they transit the Phoenix metropolitan area.

Weedy plants in the disturbed areas produce abundant seeds that are utilized by small rodents and birds including a wide variety of migrant birds. Breeding birds include seed-eating species such as Gambel's quail (*Callipepla gambelii*) and mourning dove (*Zenaidura macroura*). These, in turn, serve as food for predators such as red-tailed hawks (*Buteo jamaicensis*) and Coopers hawks (*Accipiter cooperii*). Although the study area offers few if any nesting sites for large raptors, non-nesting individuals and migrants forage the area. For instance, the kestrel (*Falco sparverius*) and small owls may nest in buildings and hunt in the DSA. See **Section 4.8** for biotic community impacts of the No-Action Alternative and proposed project.

3.11 THREATENED AND ENDANGERED SPECIES

3.11.1 OBJECTIVES AND STUDY METHODOLOGY

Special status species considered as part of this evaluation was developed from the following sources: (1) U.S. Fish and Wildlife Service (USFWS) Federally listed, proposed, and candidate species for Maricopa County, and (2) Arizona Department of Fish and Game's Heritage Data Management System (HDMS).

A response letter received by Arizona Game and Fish Department (AGFD) revealed that the Department's HDMS did not indicate the presence of any special status species within an approximate 2-mile-wide buffer surrounding the DSA. The AGFD's HDMS also revealed that there is no proposed or designated Critical Habitat in the DSA. Response letters issued by USFWS and AGFD regarding the proposed project are contained in **Appendix A**.

The potential for occurrence in the DSA of special status species was evaluated based on three criteria: (1) existing information, (2) qualitative comparisons between the known habitat requirements and biotic and abiotic conditions present, and (3) field reconnaissance conducted by qualified biologists.

3.11.2 SUMMARY AND FINDINGS

Forty-nine special status species identified by the USFWS and AGFD were reviewed for this evaluation; a list of these particular species is provided in **Table 3.11.2-1**. Of the 49 species considered, 44 do not occur or are unlikely to occur in the DSA because the project area is either: (1) clearly outside of the known geographic or elevational range of the species, or (2) does not contain habitat characteristics known to support the species. The five remaining species may occur because one or more habitat components are present in the DSA. A description of the five species is provided below.

TABLE 3.11.2-1
SPECIAL STATUS SPECIES FOR MARICOPA COUNTY, ARIZONA

Common Name	Scientific Name	Federal Status	State Status
Amphibian			
Arizona toad	*Bufo microscaphus microscaphus*	SC	--
Lowland leopard frog	*Rana yavapaiensis*	SC	--
Bird			
American peregrine falcon	*Falco peregrinus anatum*	SC	--
Bald eagle	*Haliaeetus leucocephalus*	LT	--
Cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	LE	--
Mexican spotted owl	*Strix occidentalis lucida*	LT	--
Southwestern willow flycatcher	*Empidonax traillii extimus*	LE	--
Western burrowing owl	*Athene cunicularia hypugaea*	SC	--
Western least bittern	*Ixobrychus exilis hesperis*	SC	--
Yellow-billed cuckoo	*Coccyzus americanus*	C	--
Yuma clapper rail	*Rallus longirostris yumanensis*	LE	--
Fish			
Bonytail	*Gila elegans*	LE	--
Desert pupfish	*Cyprinodon macularius*	LE	--
Desert sucker	*Catostomus clarki*	SC	--
Gila topminnow	*Poeciliopsis occidentalis occidentalis*	LE	--
Longfin dace	*Agosia chrysogaster*	SC	--
Razorback sucker	*Xyrauchen texanus*	LE	--
Roundtail chub	*Gila robusta*	SC	--
Sonora sucker	*Catostomus insignis*	SC	--
Speckled dace	*Rhinichthys osculus*	SC	--
Invertebrate			
Maricopa tiger beetle	*Cicindela oregona maricopa*	SC	--
Squaw peak talussnail	*Sonorella allynsmith*	SC	--
Mammal			
California Leaf-nosed bat	*Macrotus californicus*	SC	--
Cave myotis	*Myotis velifer*	SC	--
Greater western mastiff bat	*Eumops perotis californicus*	SC	--
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	LE	--
Pale Townsend's big-eared bat	*Plecotus townsendii pallescens*	SC	--
Sonoran pronghorn	*Antilocapra americana sonoriensis*	LE	--
Yuma myotis	*Myotis yumanensis*	SC	--
Plant			
Arizona agave	*Agave arizonica*	LE	HS
Arizona cliffrose	*Purshia subintegra*	LE	HS
Bigelow onion	*Allium bigelovii*	--	SR
Fish creek fleabane	*Erigeron piscaticus*	SC	SR
Fish creek rock daisy	*Perityle saxicola*	SC	--
Flannel bush	*Fremontodendron californicum*	--	SR
Hohokam agave	*Agave murpheyi*	SC	HS
Pima Indian mallow	*Abutilon parishii*	SC	SR
Ripley wild-buckwheat	*Eriogonum ripleyi*	SC	SR
Straw-top cholla	*Opuntia echinocarpa*	--	SR
Tonto basin agave	*Agave delamateri*	SC	HS
Toumey agave	*Agave toumeyana* var. *bella*	--	SR
Tumamoc globeberry	*Tumamoca macdougalii*	--	SR
Varied fishhook cactus	*Mammillaria virdiflora*	--	SR

TABLE 3.11.2-1 (CONTINUED)
SPECIAL STATUS SPECIES FOR MARICOPA COUNTY, ARIZONA

Common Name	Scientific Name	Federal Status	State Status
Reptile			
Arizona chuckwalla	*Sauromalus obesus tumidus*	SC	--
Arizona skink	*Eumeces gilberti arizonensis*	SC	--
Desert rosy boa	*Charina trivirgata gracia*	SC	--
Mexican garter snake	*Thamnophis eques megalops*	SC	--
Redback whiptail	*Cnemidophorus burti xanthonotus*	SC	--
Sonoran desert tortoise	*Gopherus agassizii* (Sonoran population)	SC	--

Status Definitions:

LE Listed Endangered: The ESA specifically prohibits the "take" of a species listed as endangered. Take is defined by the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct."

LT Listed Threatened: The ESA specifically prohibits the "take" of a species listed as threatened. Take is defined by the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct."

C Candidate: Species for which USFWS has sufficient information on biological vulnerability and threats to support proposals to list as Endangered or Threatened under ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity.

SC Species of Concern: Species of Concern. The terms "Species of Concern" or "Species at Risk" should be considered as terms-of-art that describe the entire realm of taxa whose conservation status may be of concern to the US Fish and Wildlife Service, but neither term has official status (currently all former C2 species).

HS Highly Safeguarded: no collection allowed.

SR Salvage Restricted: collection only with permit.

Source: USFWS July 2002; AGFD Heritage Data Management System, January 2002.

Arizona toad (*Bufo microscaphus*) (USFWS Species of Concern) - May occur at the DSA. The project area is within the known range of this species. Vegetation community (desert scrub) and landscape features (rocky stream bottom of the Salt River) resemble habitat known to support this species. Possible burrow sites may occur in the Salt River; however, no Arizona toad or signs of occupation (burrows, tracks, etc.) were detected. This species is not listed as endangered under the Endangered Species Act (ESA), and, therefore, no critical habitat has been designated.

Lowland leopard frog (*Rana yauapaiensis*) (USFWS Species of Concern) - May occur at the DSA. The study area is within the known geographic and elevational range of the lowland leopard frog. Substrate and hydrologic conditions in the Salt River are similar to habitat known to support this species. Possible burrow sites may occur in the Salt River; however, no lowland leopard frog or signs of occupation (burrows, tracks, etc.) were detected. This species is not listed endangered under the ESA, and, therefore, no critical habitat has been designated.

American peregrine falcon (*Falco peregrinus anatum*) (USFWS Species of Concern) - May occur at the DSA while foraging; however, there are no suitable roosting or nesting sites in the project area. This species is not listed endangered under the ESA, and, therefore, no critical habitat has been designated.

Cave myotis (*Myotis velifer*) (USFWS Species of Concern) - May occur in the DSA. The project area is within the known range of this species. The vegetation community and landscape features resemble those known to support the Cave myotis, including bridges and other roost sites. This species is not listed endangered under the ESA, and, therefore, no critical habitat has been designated.

Western burrowing owls (*Athene cunicularia hypugaeal*) (USFWS Species of Concern) - May occur in the DSA. The project area is within the known range of this species. Vegetation community (desertscrub) and landscape features (rodent burrows) resemble that known to support this species. Possible burrow sites in the form of underground burrows were observed, however, no burrowing owls nor signs of occupation (scat, tracks, etc.) were detected. This species is not listed endangered under the ESA, and, therefore, no critical habitat has been designated.

More detailed discussion regarding habitat requirements and potential for each respective species to occur within the DSA is included as **Appendix D** of this FEIS. See **Section 4.8** for threatened and endangered species impacted by the No-Action Alternative and proposed project.

3.12 WETLANDS

3.12.1 STUDY METHODOLOGY

Existing documents and aerial photographs were reviewed to ascertain the presence of wetland areas. Field reconnaissance of the DSA also was conducted by qualified biologists to identify wetlands. Areas were examined to determine if they exhibited the required characteristics for wetland hydrology, hydrophytic vegetation, and hydric soils that are required to be considered wetlands in accordance with the USACE delineation manual.

3.12.2 WETLAND COMMUNITIES

Two habitats that are commonly associated with wetlands were found in the Salt River channel. For the purposes of this evaluation, the habitats have been identified as riparian habitats and stormwater outfall habitats. The areas within these categories that are identified in the DSA are shown in **Figure 3.10.1-1**.

Riparian Habitat - The areas referred to as Riparian Habitat are found along the main channel of the Salt River. Though these areas appear to be wetlands, they do not possess all three of the required wetland characteristics. Therefore, they would not meet the USACE or EPA definition of wetlands.

Vegetation in these Riparian Habitats is dominated by relatively high densities of various Arizona upland plant species, which are not hydrophytic. Therefore, they are not indicators of wetlands. A small number of wetland plants are present, but their numbers are minimal. Native species such as sweetbush, palo verde, velvet mesquite, and acacia are concentrated in riparian habitat areas. Such tree species are generally less than 10 feet tall. Non-native ornamental species such as fountain grass, fan palms, pomegranate, and eucalyptus also have established in the riparian areas. These particular species may have washed in from landscaped areas surrounding the river and are associated with the natural low flow areas of the riverbed.

Water for the Riparian Habitats is primarily provided from local and regional rainfall events that result in sufficient volume to generate flow. The recently constructed low flow channel along the south bank of the Salt River has reduced the water available to the main river channel, resulting in a loss of annual or short-lived wetland species.

Because of the irregularity of flooding in the project region, hydric soils have not developed in the identified riparian areas. Although these particular areas do not consist of hydric soils, they do demonstrate a higher percentage of sandy soils than surrounding areas.

Stormwater Outfall Habitats - Rainwater falling on the airport and other impervious surfaces bordering the Salt River is gathered by a stormwater drainage system and is released into the riverbed, creating relatively small areas identified as Stormwater Outfall Habitats. When unaltered, these areas develop the three required characteristics of wetlands according to the USACE and EPA definitions. However, soil and vegetation in these areas have been previously disturbed and are removed by scouring during heavy rain events; therefore, these areas should not be characterized as wetland habitats.

Water from the stormwater drainage systems enters the Salt River at several outfall locations along the north and south banks of the river. More specifically, four outfalls were identified that discharge sufficient water to sustain an area containing hydrophytic vegetation such as cattail, coyote willow, and sedges. The additional water has also created a dense stand of Arizona upland species such as desert broom. Fan palms have become established at the outfall, as have other exotic species such as fountain grass, eucalyptus, salt cedar, bermuda grass, and lilac chaste tree.

A thin layer of rich, organic soil has developed on top of the gravel and river rocks that form the substrate for these habitats. The soil appears to be largely composed of sediment from the stormwater, but is augmented by the organic matter formed from the abundant plant growth at the location. The soil that has formed is dark and anaerobic, indicating that it is a hydric soil.

During field investigations during extended drought conditions, standing water and saturated soils were present at these particular areas. The hydrology of the sites suggests water is delivered to the site consistently enough to maintain hydrophytic plants. See **Section 4.18** for wetland impacts associated with the No-Action Alternative and proposed project.

3.13 FLOODPLAINS

3.13.1 FLOODPLAIN REGULATIONS

Minimum floodplain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations, 44 CFR 60.3. The Legislature of the State of Arizona has in ARS 48-3601 through 48-3627 empowered local government agencies to regulate flood hazard areas. Maricopa County and the City of Phoenix participate in the National Flood Insurance Program by implementing the following Floodplain Ordinances pertaining to development within 100-year floodplains:

- Maricopa County - Articles 1 through 19 of the Floodplain Regulations for Maricopa County, and
- The Code of the City of Phoenix, Arizona - Chapter 32B Floodplains (Sec. 32B-1 through 32B-17).

Executive Order *11988, Floodplain Management,* directs Federal agencies to take action to reduce the risk of flood loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural beneficial values of floodplains. The Executive Order defines floodplains as the "lowland and relatively flat areas adjoining inland and coastal waters, including flood prone areas of offshore islands, including at a minimum, those that are subject to a 1-percent or greater chance of flooding in any given year" (i.e., area inundated by a 100-year flood). The 100-year flood (1 percent annual chance) has been adopted by the Federal Emergency Management Agency (FEMA) as the base flood for floodplain management purposes.

The FEMA manages the National Flood Insurance Program (NFIP) based on maps showing floodplains and hazard areas. As part of the agreement for making flood insurance available in Maricopa County, local jurisdictions (including Maricopa County and the City of Phoenix) adopt floodplain management ordinances containing certain minimum requirements intended to reduce future flood losses. The local jurisdictions are also responsible for submitting data to FEMA reflecting revised flood hazard information so that the NFIP maps can be revised as appropriate.

Department of Transportation Order 5650.2, *Floodplain Management and Protection,* and FAA Orders 1050.1E and 5050.4A contain policies and procedures for implementing the Executive Order and evaluating potential floodplain impacts. These orders require the FAA to review potential floodplain impacts, and where encroachment would occur, take steps to minimize potential harm to or within the base floodplain. In case of significant encroachment, a finding is required to confirm there is no practical alternative and all measures to minimize harm are included in the project.

Additionally, FAA Order 5050.4A paragraph 47 (e)(12)(g)(6) requires the FAA to provide the public with an early opportunity to review base floodplain encroachments associated with aviation projects. Presently, only preliminary conceptual designs for the APM conveyance across the Grand Canal and connection to the proposed Central Phoenix/East Valley Light Rail Transit project have been developed.

3.13.2 FLOODPLAIN DESCRIPTION

A Federal Emergency Management Agency (FEMA) designated 100-year (base) floodplain is located along the Salt River at the eastern and southern portions of the airport. The Flood Insurance Rate Maps (FIRM) prepared by FEMA (July 19, 2001) were used to establish the boundary of the 100-year floodplain. **Figure 3.13.2-1** (FIRM Community Panel Nos. 04013C2145G and 04013C2165G) shows the 100-year floodplain and the existing levee improvements along the north bank of the Salt River Channel. The Salt River is a regulatory floodway as designated by FEMA. A floodway represents the deepest and fastest moving part of the river, which should not be obstructed to allow for floodwaters to flow downstream. Zone AE corresponds to the 100-year floodplains that are determined in the Flood Insurance Study (FIS) by detailed methods. Zone A corresponds to the 100-year floodplains that are determined in the FIS by approximate methods. **Figure 3.13.2-1** shows the Flood Control District Maricopa County designated Floodplains that are located within the GSA.

The entire northeast bank of the Grand Canal, to the termination of the APM area of disturbance (on Washington Street) is within the 100-year floodplain of the canal. This area is designated Zone A by

FEMA, meaning that no base flood elevation has been determined for the area. The location of the proposed APM terminus and Light Rail Transit (LRT) platform is located within this 100-year floodplain. The site, bounded by Grand Canal to the south, SR 153 to the east, and Washington Street to the north, is currently developed with a surface vehicle parking lot (paid parking facility), administrative/fee collection building, and attendant facilities (i.e., lighting and fencing). See Section 4.9 for floodplain impacts associated with the No-Action Alternative and proposed project.

3.14 COASTAL ZONE MANAGEMENT AND COASTAL BARRIERS

PHX is not located in a coastal zone nor is it in a state with an approved Coastal Zone Management Program (16 U.S.C. 1451-1464). In addition, the airport is located inland, and, therefore, no airport lands are designated as coastal barriers pursuant to the Coastal Barrier Resources Act.

3.15 WILD AND SCENIC RIVERS

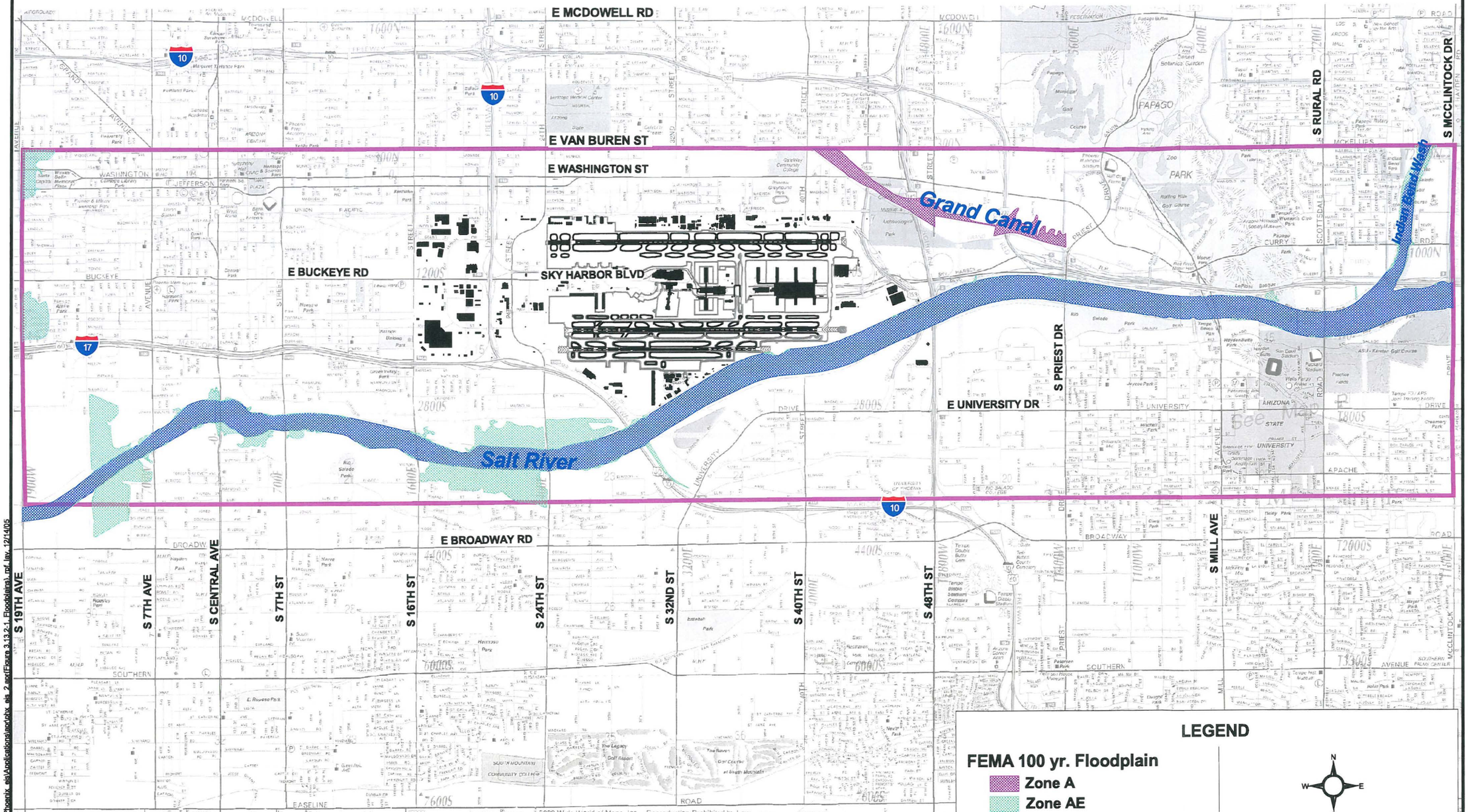
In October 1968, the Wild and Scenic Rivers Act was signed into law by Congress. The intent of the law is to preserve selected rivers of the United States that possess certain outstandingly remarkable values. To accomplish this goal, Congress established the National Wild and Scenic Rivers System (System). To qualify for enlistment in the system, a river or river segment must be in free-flowing condition and must be deemed to have one or more "outstandingly remarkable" scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values (Wild and Scenic Rivers Coordinating Council, 1998).

The U.S. Department of the Interior, National Park Service (NPS) maintains an inventory of river segments that qualify for inclusion in the system (www.wps.gov/rivers). According to NPS, there is only one Wild and Scenic River in the State of Arizona. This includes that portion of the Verde River located on the Prescott National Forest about 100 miles north (upstream) of the City of Phoenix. Therefore, there are no Wild and Scenic Rivers within the GSA.

3.16 SOILS/FARMLANDS

Airport property consists of well-drained soils of mixed alluvial origin. Table 3.16-1 provides a brief description of the soil types identified in the DSA. The DSA is comprised primarily of Alluvial Land and Gillman Loam soil types.

In 1981, Congress passed the Agricultural and Food Act of 1981 (Public Law 97-98) containing the Farmland Protection Policy Act (FPPA). The final rules and regulations regarding FPPA were published in the *Federal Register* in June 1994. In implementing NEPA, the FPPA is intended to minimize the impact federal programs have on the conversion of farmland to nonagricultural uses. It ensures, to the extent possible, that Federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland.



Sources:
-©2002 Wide World of Maps, Inc.
(Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-Federal Emergency Management Agency
-URS Corporation

LEGEND

FEMA 100 yr. Floodplain
- Zone A
- Zone AE
- Floodway

Other Features
- Generalized Study Area

N W E S

2000 0 2000 4000 Feet

Scale: 1" = 4000'

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Floodplains

FIGURE 3.13.2-1

TABLE 3.16-1
SOIL TYPES AND CHARACTERISTICS IN THE DETAILED STUDY AREA

Soil Type	Characteristics
Alluvial Land	These soils result from sediments deposited by stream channels. The material can range from acidic to basic, and from very gravely sands to very fine loams.
Gilman Fine Sandy Loams	These are well-drained soils that occur on floodplains and alluvial fans of the Salt River and other large drainages. These soils also are moderately alkaline and calcareous throughout. Runoff potential is considered slow, and wind erosion is a slight hazard.

Source: U.S. Department of Agriculture, Soil Conservation Service, 1974 Farmland Overview.

The U.S. Department of Agriculture and Natural Resource Conservation Service (NRCS) have identified several locations within the GSA that are comprised of soils that are considered to be prime or unique farmlands. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. Prime farmland does not include land already in or committed to urban development or water storage. Unique farmland is land other than prime farmland that is used for the production of specific high-value fiber crops and has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods.

The DSA has been developed and thus is no longer suitable for agricultural purposes. Importantly, none of the improvements associated with the proposed project would affect soils characterized as prime or unique by NRCS.

3.17 ENERGY SUPPLY AND NATURAL RESOURCES

Review of aerial photographs, USGS Topographic 7.5 Minute Series Quadrangles for the DSA, and land use maps were used to determine if any natural sources of mineral or energy resources are located within the AOD. Within the GSA, mining activities, for sand, gravel and crushed stone occur along the Salt River. However, the analysis indicates that there are no known natural sources of mineral or energy resources within the AOD. PHX's electrical energy is supplied by Arizona Public Service. During the period of June 2001 through May 2002, electric use to support terminal operations at PHX totaled approximately 109.1 Mw/hrs. **Section 4.13** of this FEIS provides information on the projected use of electrical power associated with the ADP Alternative.

3.18 LIGHT EMISSIONS

Airport facilities are illuminated by various types of lighting that can impact light-sensitive areas in the vicinity of an airport. These lights can emanate from any on the following:

- Airfield Lighting,
- Visual Navigational Aids,
- Terminal and Apron Lighting, and
- Surface Transportation Lighting.

Airfield lighting and visual navigational aids at PHX consist of High Intensity Runway Lights (HIRLs), Visual Approach Slope Indicators (VASIs), centerline lights, Medium intensity Approach Lighting on Rails (MALSRs) and Runway End Identifier Lights (REILs). An HIRL system consists of a configuration of lights that define the lateral and longitudinal limits of the usable landing area. A VASI-4 consists of four light units, two light units in each bar. A MALSR is a uni-directional, medium intensity white approach light system, angled slightly upward along the approach path of the runway. The REIL system is used to provide rapid and positive identification of the approach end of the runway threshold. Airfield lighting also includes taxiway lighting to guide aircraft to and from the taxiways and runways. Lighting associated with the airfields is generally low to the ground and low intensity.

Terminal lighting includes systems to illuminate both the internal and external areas of the terminal. Interior lighting illuminates the airport for usage by passengers and employees. Exterior lighting includes parking areas, aprons, airport roadways, and transfer areas to name a few.

The area surrounding PHX is an urban landscape as described in **Section 3.4**, Land Use. Illuminated areas not a part of the terminal and concourse areas include various businesses and cargo buildings north of the airport, rental car facilities to the east, Air National Guard facilities to the south and airport parking facilities to the east. In addition, the airport is encircled by major highways, interstates, and other local roads illuminated by streetlights. While light sensitive areas are located in the general vicinity of PHX, they are not located immediately adjacent to the airport. See **Section 4.12** for light emission impacts associated with the No-Action Alternative and proposed project.

3.19 SOLID WASTE

The City of Phoenix currently disposes of residential and commercial waste at the Skunk Creek Landfill that is owned and operated by the city. Skunk Creek Landfill is expected to reach capacity in 2005. The estimated total remaining capacity is 275.3 million cubic yards.

The regional landfill capacity currently available in Phoenix metropolitan area is sufficient for the regional estimated expected waste generation up to the year 2030. The city had the option of contracting with existing landfill owners to dispose of the city's waste; however, to provide sufficient future landfill capacity, a new landfill, transfer station and material recovery facilities were required. If all the waste currently collected by the city is disposed at a newly permitted landfill, an estimated landfill capacity of 171 million cubic yards will be required to provide disposal services for 50 years after the closure date of Skunk Creek Landfill (2005).

The city conducted a study to site and permit a new landfill and transfer station/material recovery facility to replace Skunk Creek Landfill and to provide disposal/capacity for the city residents well into the future. On January 15, 2002, the Phoenix City Council approved Public Works to acquire and begin the process of permitting a new landfill facility called the SR 85 site. The City of Phoenix plans to begin operations at the landfill in 2005. The Town of Buckeye annexed the property in August 2002. The SR 85 site is located on privately owned land on the west side of SR 85 just south and west of the Sam Lewis Prison on Patterson Road. The site is in unincorporated Maricopa County, but within the municipal planning area for the Town of Buckeye.

The average residential waste generation rate (WGR) for the City of Phoenix for the calendar years 1998 through 2000 was 0.70 tons/resident/year. The average commercial WGR for the City of Phoenix for the calendar years 1998 through 2000 was 0.61 tons/employee/year. Recycling efficiency is approximately 10 percent of the total waste stream into facilities.

According to FAA AC 150/5200-33A, *Hazardous Wildlife Attractants On or Near Airports*, waste disposal sites that have the potential to attract birds are considered incompatible if located within 10,000 feet (1.9 statute miles) of any runway end used or planned to be used by turbine-powered aircraft or located within a 5-mile radius of a runway that attracts or sustains hazardous bird movements into or across the runways and/or approach and departure patterns of aircraft. There are no landfills within 10,000 feet of any runway or within a 5-mile radius of PHX. See **Section 4.10** for solid waste impacts associated with the No-Action Alternative and proposed project.

Chapter 4.0
Environmental Consequences

CHAPTER 4.0
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

The potential environmental impacts resulting from the construction and operation of the Airport Development Program (ADP) Alternative and the No-Action Alternative at Phoenix Sky Harbor International Airport (PHX) are presented in this chapter. The following alternative scenarios are examined for the study year 2015.

No-Action Alternative: The No-Action Alternative assumes the proposed West Terminal Complex and associated improvements would not be developed. Terminals 2, 3, and 4 would continue to serve as the passenger processing facilities at PHX. Terminal 2 would be renovated and converted to an airfield bus terminal to serve remote gate parking positions. Internal modifications (i.e., terminal rehabilitations) would be accomplished to increase, to the extent practicable, capacity of the passenger processing facilities. Crossfield taxiways "U" and "V" and Stage 2 of the Automated People Mover (APM) would not be constructed. Sky Harbor Boulevard would not be realigned or improved.

Airport Development Program (ADP) Alternative: The ADP Alternative would replace the existing Terminal 2 and provide for the construction of a new West Terminal and associated improvements at PHX. The ADP Alternative improvements include:

- Demolition of Terminal 2 and Ancillary Facilities;
- West Terminal Development (33-gate) Garage and Terminal Facilities;
- Modifications to Terminal 4, Concourse N4 International Gates;
- Construction of Crossfield Taxiways Uniform "U" and Victor "V";
- Sky Harbor Boulevard Modifications; and
- Construction of Stage 2 of the Automated People Mover System (APM).

The proposed West Terminal would be constructed west of Terminal 3 at the location of the existing Terminal 2. This site is located in the central core of the airport along Sky Harbor Boulevard, between Runway 8/26 and Runway 7L/23R.

The year 2015, examined for the No-Action and ADP Alternative, is projected to be the first year that the West Terminal and associated developments would be operational and represents the study year for the EIS.

Comparison of the No-Action Alternative and the ADP Alternative, relative to the environmental impact categories described in FAA Orders 5050.4A and 1050.1E, show few differences in environmental impacts. **Table 4.1-1** provides a summary of environmental impacts associated with the implementation of the No-Action Alternative or ADP Alternative. These summary findings are discussed in further detail in the following subsections. Within this chapter of the FEIS, each subsection begins with a brief overview of impacts (printed in bold), followed by methodology, results, and a discussion of whether mitigation concepts are applicable. Specific mitigation measures are presented in **Chapter 5.0**, Mitigation, of this FEIS.

TABLE 4.1-1
SUMMARY OF ENVIRONMENTAL IMPACTS

Environmental Impact Categories	Level of Impact	
	No-Action Alternative	ADP Alternative
Air Quality		
• Operational Air Emissions Inventory (Annual Total - tpy)		
– CO	11,301	11,084
– NO_x	2,513	2,471
– PM_{10}	111	108
– $PM_{2.5}$	108	105
– VOCs	1,187	1,150
Coastal Resources	No	No
Construction Impacts	No	Yes
Compatible Land Use		
• Number of Land Owner Businesses Acquired and/or Relocated	0	14
• Number of Tenant-Run Businesses to be Relocated	0	17
• Number of Residences Acquired	0	0
• Number of Property Owners	0	19
• Number of Parcels Impacted	0	92
• Property Acquisition (acres)	0	16.4
DOT Section 4(f)		
• Direct Impacts	No	Yes
• Indirect Impacts	No	Yes
Farmlands (acres)	0	0
Fish, Wildlife, and Plants (Number of Species / Acres)	0 / 0	0 / 0
Floodplains	No	Yes
Hazardous Materials	Yes	Yes
Solid Waste		
• Construction and Demolition Debris	No	Yes
• Landfill Proximity Conflicts	No	No
Historic, Architectural and Cultural	No	Yes
Light Emission	No	No
Visual	No	Yes
Natural Resources	No	No
Energy		
• 2015 Fuel Consumption* (million gal/yr)	55.6	53.6
• Electric Power Consumption	No	No
Noise (acres of non-compatible land use within the DNL 65+ dBA area)	295.1	295.1
Secondary (Induced) Impacts		
• Acquisitions and relocations (residential / businesses)	0 / 0	0 / 31
• Division or disruption of established communities	No	No
• Alteration of surface transportation patterns	No	Yes[2]
• Disruption of orderly planned development	No	No
• Appreciable change in employment (additional employees at PHX)	No	5,400
Socioeconomic, Environmental Justice, Children's Health		
• Shifts in population movement and growth	No	No
• Changes in public service demands	No	No
• Changes in business and economic activity	No	Yes
• Environmental justice considerations	No	No
• Environmental health and safety risks to children	No	No
Water Resources		
• Water Consumption [1]	0	16.9 mg/y
• Water Quality	No	No
Wetlands (acres)	0	0
Wild and Scenic Rivers	No	No

Notes: tpy - tons per year Yes - Potential impacts, but not significant No - No impacts

[1] Net change in water consumption following demolition of Terminal 2 and development of the West Terminal.

[2] Sky Harbor Boulevard realignment will improve traffic flow and reduce congestion.

Source: URS Corporation, 2004.

4.2 AIR QUALITY

4.2.1 OVERVIEW OF IMPACTS

Maricopa County is currently designated by the U.S. Environmental Protection Agency (EPA) as "nonattainment" for the following criteria air pollutants: ozone (O_3) 8-hour standard and particulate matter (PM_{10}). These designations signify that the air quality in this area does not meet the National Ambient Air Quality Standards (NAAQS) and that a State Implementation Plan (SIP) is in place to bring the area into compliance. The area recently met the NAAQS for carbon monoxide (CO) and ozone 1-hour standard and was redesignated attainment/maintenance. Maricopa County is in attainment of the $PM_{2.5}$ and other three EPA criteria air pollutant standards (NO_2, SO_x, and Pb).

When compared to baseline (2001) conditions, the total amounts of air emissions at PHX are expected to increase in the future (2015), with or without the proposed improvements. This outcome is based on an air quality analysis conducted for airport sources of emissions and is largely attributable to the forecasted increased aircraft operations at PHX over the same timeframe.

However, under the future ADP Alternative, total operational emissions are expected to be less than that expected for the future year No-Action Alternative. This is primarily due to the improved airfield operating characteristics, reduced delay times, and the projected reduction of aircraft hardstand operations in the terminal area. A temporary increase in air emissions associated with the construction of the ADP Alternative would occur.

The sum of project-related construction and operational emissions for each year, from 2008 through 2015, are all below the *de minimis* thresholds of the General Conformity Rule. As a result, the General Conformity Rule does not apply and no further demonstration is required to show that the ADP Alternative conforms to the SIP. Since there are no roadway improvements connected with the ADP Alternative, which are funded or approved by the Federal Highway Administration (FHWA)/Federal Transit Authority (FTA), the Transportation Conformity Rule also does not apply. Hazardous Air Pollutants (HAPS) have also been addressed.

4.2.2 METHODOLOGY

The methodology (including computer models, technical approaches, etc.) used to prepare the emission inventory for this air quality analysis is consistent with the latest version of the Federal Aviation Administration (FAA) *Air Quality Handbook* (FAA, 1997 and 2004). This guidance document provides both regulatory context and technical direction for completing airport-related air quality impact assessments.

The primary tool that was used to assess the operational emissions is the FAA *Emissions Dispersion & Modeling System* (EDMS) (FAA, 2003). EDMS is identified as the "required" model by FAA and the "preferred" model by the EPA for the conduct of airport air quality assessments. The most recent version of EDMS (Version 4.12) at the time of analysis was used, which incorporates up-to-date aircraft emission

factors, included the latest motor vehicle emissions from the MOBILE 6.2 model (EPA, 2003). The EPA and the FAA's *Air Quality Handbook* require the use of this model to evaluate motor vehicle emissions.

For the emissions inventory, the pollutants analyzed include CO, NO_x, PM_{10}, $PM_{2.5}$, and O_3. Because O_3 emissions cannot be calculated directly by EDMS, hydrocarbons (represented by VOCs) and NO_x, the two primary precursors to O_3 formation, are used to evaluate the impact of this pollutant. Sulfur dioxide (SO_2) was not included in the emission inventory calculations because: 1) the Phoenix area is in attainment for SO_2, 2) ongoing regulatory mandated reductions of the sulfur content in liquid fuels will reduce SO_2 emissions in the future, and 3) transportation sources emit very small quantities of SO_2. Lead (Pb) was also not included in the emission inventory calculations because: 1) the Phoenix area is in attainment for Pb, and 2) as stated in Section 2.1.2 of the FAA's Air Quality Handbook, "Analyses routinely do not consider the pollutant lead (Pb) since airports ... typically are not significant sources of lead emissions." In addition, as shown below, emissions of all other pollutants will be reduced due to the implementation of the proposed ADP project; thus, emissions of SO_2 and Pb will also be reduced.

4.2.2.1 Operational Emissions Inventory

For this analysis, standard EDMS parameters and databases were used except where PHX-specific inputs were available and more appropriate. Aircraft, ground service equipment (GSE), motor vehicles, and other sources of emissions included in the emissions inventory are briefly described below.

Aircraft

The most recent forecasts of future year operations at PHX by aircraft type (e.g., commercial, cargo, general aviation, etc.) used for the noise impact analysis in **Section 4.14** were also used as the basis for the air quality analysis. Aircraft/engine combinations and individual aircraft engine emission factors were obtained from the EDMS database. Summary tables provided in **Appendix F** list the aircraft and engine type combinations used for this analysis.

The times that aircraft are in their airborne and ground-based operational modes are referred to as a Landing and Takeoff (LTO) cycle. An LTO cycle equals two operations (i.e., one landing and one takeoff) and within EDMS, they are further subdivided into the following four modes:

- **Approach/Landing Mode** - Begins when an aircraft descends below the atmospheric mixing height (default 3,000 feet above ground level (AGL)) and ends when the aircraft touches down on the runway and decelerates to the taxi/idle mode. Depending on the aircraft type, this time varies from 1.02 to 3.54 minutes in this analysis.

- **Climbout Mode** - Begins when the aircraft is 1,000 feet AGL and ends when the aircraft reaches an altitude of 3,000 feet AGL (the default atmospheric mixing height). Again, depending on the aircraft type, this time ranges from 0.02 and 0.22 minutes.

- **Takeoff Mode** - Begins when takeoff power is applied to an aircraft and ends when an aircraft reaches 1,000 feet AGL. This time varies between 0.65 and 1.98 minutes, again by aircraft type.

- **Taxi/Idle Mode** - Comprises all of the time periods when an aircraft is on the airport taxiway system or terminal area aprons with its engines running. This includes all

ground-based delays incurred or encountered between the runway ends and the terminal gates. The total duration of this mode is largely a function of the airport design, layout, and operational capacity and assumes that all aircraft travel at approximately the same speed while on the airfield. For this air quality analysis, the full time for this mode (which includes taxi-in, taxi-out, and delay) is taken to be about 20 minutes under baseline conditions and projected to extend up to about 51 minutes by 2015.

Instead of using the default atmospheric mixing height of 3,000 feet, an actual mixing height for the Phoenix area was determined following guidance from Section 5.2.2 in the *Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources* (EPA, 1992). For this analysis, five years of Phoenix mixing height data (1987-1991) were averaged to determine a five-year annual morning average of 1,121 feet AGL.

EDMS automatically calculates the times-in-mode for the approach/landing, climbout, and takeoff modes for each aircraft classification type (e.g., heavy jet, turbo prop, etc.). These model inputs were the same for the No-Action and ADP Alternatives because the durations of these low-level airborne operations are essentially independent of runway/taxiway utilization and location scenarios. For this analysis, the taxi/idle times were derived from Table V-2 in the *Crossfield Taxiway Simulation Analysis*, (Ricondo, 2003). Consistent with FAA guidelines, aircraft emissions above the atmospheric mixing height would have no ground-level effect and were not included in the inventory. All of the aircraft times-in-modes used in this analysis are listed in summary tables contained in **Appendix F**.

Particulate emissions from aircraft engines were calculated using the procedure described in the FAA's policy memorandum of May 24, 2005 titled *Use of First Order Approximation (FOA) to estimate aircraft engine particulate matter (PM) emissions in NEPA Documents and Clean Air Act General Conformity Analyses*. This method is based on a mathematical estimation of particle mass emissions based on a correlation between an aircraft's Smoke Number (a dimensionless term, SN, which quantifies smoke emissions from aircraft engines based on opacity), as reported by the International Civil Aviation Organization's (ICAO) engine emissions certification databank and the engine's fuel flow characteristics at different modal power settings. To account for the volatile portion of PM emissions, a conservative adjustment factor is included based on field measurements and theoretical relationships. Particulate matter emission indices by aircraft operating mode (takeoff, climbout, approach, and taxi/idle) were provided by FAA's Office of Environment and Energy.

The calculation of PM emissions consists of the following steps:

- For each aircraft, calculate the emission rate for each LTO using the following equation:

$$ER_i = \sum_{j=1}^{4} (EI_j \times TIM_j)$$

Where,

ER_i is the emission rate of "aircraft i"

EI_j is the engine's emission index of mode j (1 – takeoff, 2 – climbout, 3 – approach, 4 – idle) and

TIM is the time-in-mode of mode j (in minutes)

- The total PM emissions of an aircraft is calculated using the following equation:

$$EM = \sum (ER_i \times LTO_i)$$

LTO_i is the annual LTO of aircraft i.

The PM emission indices for each aircraft type are shown in Appendix F.

Ground Service Equipment

GSE associated with both commercial and cargo aircraft at PHX include baggage and pushback tugs, baggage and cargo loaders, fuel trucks and other service vehicles, and auxiliary power units (APU). For this analysis, the GSE fleet, fuel types and operating times were derived from surveys performed at the airport in February 2003, along with supporting data from PHX and other airports. Due to the southern location of PHX, weather is not a factor in the operation of the airport, and the number of operations and passengers do not vary significantly during the year, therefore, the survey of GSE operating times in February would be representative of any time of year. Also, if there would be an increase in operations and/or passenger loads, it would probably occur during the months of January through March, due to increased tourism. This in turn may equate to higher or more conservative GSE operating times during this period, due to the increased activity. These data were supplemented with information contained in the EDMS GSE database, which is also the source of the GSE emission factors. Summary tables contained in Appendix F list the GSE population, operational times, etc., used in this analysis.

Motor Vehicles

For this analysis, airport-related motor vehicles were segregated into two categories: on-airport motor vehicles and off-airport motor vehicles. This differentiation method avoids the duplication, or double counting, of motor vehicle emissions associated with PHX.

On-airport motor vehicles (i.e., cars, vans, limousines, buses, trucks, etc.) are those that are operating on the airport's primary internal roadway network and within the parking facilities located on the airport. These motor vehicles are primarily associated with airport patron, employee, and cargo trips operating within the airport's borders. Traffic volumes on these roadways and facilities were based on the *West Terminal EIS Future Traffic Condition - 2015 No Build Alternative and 2015 Build Alternative* reports

(HDR, June and November 2003). Total on-airport daily vehicle miles traveled (VMT) between the 2015 No-Build and Build Alternatives were also specifically computed for this analysis (HDR, 2004).

The motor vehicle engine emission factors were derived from the EPA mobile source emissions model, MOBILE 6.2. For this analysis, the most recent available Maricopa County-specific motor vehicle operating characteristics (i.e., fleet mix, emission control programs, operating temperatures, etc.) were obtained from the Maricopa Association of Governments (MAG) (MAG/URS, September 2005). These and other supporting data used to assess on-airport motor vehicle emissions are contained in **Appendix F**.

Off-site airport-related motor vehicle traffic traveling to and from PHX is inherently integrated with all of the non-airport traffic operating on the same highways, toll roads, and roadways. Therefore, this airport traffic is already included in the regional transportation system Traffic Demand Model for the metropolitan Phoenix area. As a result, the emissions associated with these vehicles are already accounted for in the Transportation Improvement Plan (TIP) for Maricopa County (MAG Conformity Analysis, 2003). As such, PHX-related off-site motor vehicle emissions are considered covered under the TIP and are not duplicated in this analysis.

Other Sources of Operational Air Emissions

Stationary sources of emissions at PHX, such as boilers, incinerators, and emergency generators, are documented by the Maricopa County Environmental Services Department (MCESD), Emission Inventory Unit (MCESD, 2003). This information served as the basis of the baseline conditions (year 2001) emissions inventory as discussed previously in **Section 3.5**, Air Quality, of this FEIS. Future year emissions from stationary sources were derived by extrapolation from this baseline to the year 2015 based on the increase of terminal area, which includes the demolition of Terminal 2 and the construction of the West Terminal Complex. The difference in the footprint area of the terminals would be approximately an additional 725,000 square feet in 2015 for the ADP Alternative. A growth rate for the airport was also applied to account for additional stationary source air emissions due to the increase in passengers (approximately 45 percent) over 2001 levels.

Emissions from fuel used at the Aircraft Rescue and Fire Fighting (ARFF) Training Facility were not available; however, it was assumed that the same amount and type of fuel used in the training fires in 2015 would be the same for both alternatives, causing no net increase in future year emissions.

Fueling activities represent potential sources of evaporative VOC emissions. At PHX, the primary source of evaporative VOC emissions are associated with the refueling of commercial jet aircraft, with comparatively smaller utilization of aviation gasoline (AVGAS), gasoline, and diesel. For this analysis, the amounts of fuel-related VOC emissions generated are based on the types and amounts of fuels stored and dispensed as provided by MCESD. Future year emissions were projected from existing values according to the forecasted increase in aircraft operations at PHX for the year 2015 (21 percent).

Other minor potential air emissions sources at PHX such as the storage and use of evaporative solvents, paints, and other coatings that contain VOCs, constitute a minor contribution and were not included in the inventory.

4.2.2.2 Construction Air Emissions Inventory

The construction of the ADP Alternative at PHX represents temporary sources of emissions; the types and amounts of which would vary in time and by location depending on the nature of the operation, the level of activity, and the local weather conditions. These emissions are primarily associated with the exhaust products from construction equipment; the disturbance and movement of earthen materials, various forms of solid waste, debris and building materials; and evaporative VOCs from asphalt paving operations. Even though these emissions are temporary, they are potentially subject to the CAA General Conformity requirements as a "direct source" and make up part of the SIP emissions budget for the metropolitan Phoenix nonattainment area. For this reason, construction-related emissions are also included in the emissions inventory.

The following construction projects are included in this analysis as they are considered to be the "direct and connected" actions making up the ADP Alternative as discussed in **Section 2.3.2.4**, Airport Development Program, of this FEIS:

- Demolition of Terminal 2 and Ancillary Facilities,
- West Terminal Development (33-gate Terminal), Garage, and Terminal Roadways,
- Modifications to Terminal 4, Concourse N4 International Gates,
- Construction of Crossfield Taxiways Uniform "U" and Victor "V,"
- Sky Harbor Boulevard Modifications, and
- Construction of Stage 2 of the APM.

According to the development schedule for the ADP Alternative at PHX, these individual projects are planned for construction between the years 2008 to 2014. The modifications to Terminal 4 and the concourse providing service to international operations would be done internally and would not have any significant outside construction emissions associated with the ADP Alternative.

For this analysis, it was conservatively assumed that there would be no construction emissions associated with the No-Action Alternative. For the ADP Alternative, construction-related emissions were computed based on equipment type and hours of operation information based on the *Construction Quantities and Equipment Usage Technical Memorandum* (HDR, 2005) and other supporting information (see **Appendix F**). These estimates were based on conservative approximations of scheduling, manpower, and equipment required for the individual elements of the project.

Additional information and data collected and developed in support of this analysis are also included in **Appendix F**.

4.2.3 YEAR 2015 IMPACT POTENTIAL

4.2.3.1 Operational Emissions Inventory

The results of the air quality assessment conducted for the ADP Alternative are presented in this section. This includes emissions inventories for both operational and construction-related emissions.

The year 2015 operational air emissions inventory for PHX is summarized in Table 4.2.3-1. The results are segregated by pollutant type (i.e., CO, VOCs, NO_x, PM_{10}, and $PM_{2.5}$) and project alternative (i.e., No-Action Alternative and ADP Alternative). The data is further subdivided by emission source (i.e., aircraft, GSE, on-site motor vehicles, etc.). Based on the EDMS output, these results are presented as annual totals in units of tons per year (tpy).

TABLE 4.2.3-1
2015 OPERATIONAL AIR EMISSIONS INVENTORY[1]

Source	Pollutant				
	CO	NO_x	PM_{10}	$PM_{2.5}$	VOCs
No-Action Alternative					
Aircraft	5,739	2,170	84[3]	84[3]	898
GSE	4,536	255	22	21	190
Motor Vehicle Idle Time	26	2	< 1	< 1	5
Motor Vehicle Roadways[2]	1,000	86	5	3	66
Stationary Sources	< 1	< 1	< 1	< 1	9
Fueling Emissions	---	---	---	---	19
Annual Total (tpy)	**11,301**	**2,513**	**111**	**108**	**1,187**
ADP Alternative					
Aircraft	5,493	2,125	81[3]	81[3]	858
GSE	4,536	255	22	21	190
Motor Vehicle Idle Time	23	2	< 1	< 1	4
Motor Vehicle Roadways	1,032	89	5	3	68
Stationary Sources	< 1	< 1	< 1	< 1	11
Fueling Emissions	---	---	---	---	19
Annual Total (tpy)	**11,084**	**2,471**	**108**	**105**	**1,150**

Notes:
[1] Based on approximately 335,000 LTOs projected for 2015.
[2] Includes hardstand shuttle bus emissions (0.34 CO, 0.57 NO_x, 0.04 PM_{10}, 0.03 $PM_{2.5}$, and 0.11 VOC) tpy.
[3] Particulate emissions from aircraft were calculated using the procedure described in FAA policy memorandum of May 24, 2005 titled *Use of First Order Approximation (FOA) to estimate aircraft engine particulate matter (PM) emissions in NEPA Documents and Clean Air Act General Conformity Analyses.*

Sources: EDMS Version 4.12; MOBILE6.2, URS Corporation, 2004 and 2005.

From these data, several general observations and trends are evident in connection with future year (2015) operational emissions at PHX and they are summarized as follows:

- Emissions of CO, NO_x, PM_{10}, $PM_{2.5}$, and VOCs are expected to increase from 2001 levels in response to the forecasted increase in the airport's operational levels and the anticipated increase in the aircraft taxi/idle (delay) modes over the same timeframe.

- Because of efficiencies that will be achieved with the ADP Alternative, there are only minor differences in total emissions between the Build and No-Action Alternatives,

which range from 0 to 3 percent between pollutants. When compared with the No-Action Alternative, the total emissions for all criteria pollutants associated with the ADP Alternative would decrease.

- Aircraft represent the largest source of CO (approximately 49 percent of the total), NO_x (approximately 86 percent of the total), PM_{10} (approximately 75 percent), $PM_{2.5}$ (approximately 77 percent), and VOC (approximately 75 percent of the total) emissions.
- GSE represents the second largest source of CO (approximately 41 percent of the total) emissions.
- On-airport motor vehicles represent 10, 4, 5, 3, and 6 percent, respectively, of total emissions of CO, NO_x, PM_{10}, $PM_{2.5}$, and VOCs.
- Stationary and fueling sources represent 3 percent or less of all emissions.

Specific findings and outcomes from the 2015 operational emissions inventory are discussed below, by alternative.

4.2.3.2 No-Action Alternative

As shown in **Table 4.2.3-1**, total emissions of CO would be 11,301 tpy; 2,513 tpy for NO_x; 111 tpy for PM_{10}; 108 tpy for $PM_{2.5}$; and 1,187 tpy for VOCs under this alternative. Compared to the results of the 2001 (baseline conditions) emissions inventory presented in **Section 3.5.8**, Air Quality, this represents an increase in total emissions of approximately 22 percent. This increase is largely attributable to the forecasted growth in operations at the airport and anticipated increase in the aircraft taxi/idle (delay) mode over this same timeframe, which will occur regardless of whether the ADP Alternative is implemented. Although the hardstand shuttle bus emissions are <1 tpy per pollutant, they do increase emissions slightly for the No-Action Alternative.

4.2.3.3 Airport Development Program Alternative

The ADP Alternative total emissions of CO are predicted to be 11,084 tpy; 2,471 tpy for NO_x; 108 tpy for PM_{10}; 105 tpy for $PM_{2.5}$; and 1,150 tpy for VOCs. Compared to the 2015 No-Action Alternative, this represents lower emissions of 217 tpy (-1.9 percent) for CO; 42 tpy (-1.7 percent) for NO_x; 3 tpy (-2.7 percent) for PM_{10}; 3 tpy (-2.9 percent) for $PM_{2.5}$; and 37 tpy (-3.2 percent) for VOCs under the ADP Alternative compared with the No-Action Alternative. These changes are attributable to the forecasted reduction in aircraft taxi/idle (delay) times associated with this alternative, along with the removal of aircraft hardstand shuttle bus emissions. There would be some slight increase in stationary source and roadway emissions due to the increase in terminal area and new on-airport roadways for this alternative; however, there is a larger decrease in emissions from aircraft operations. Compared to the results of the No-Action emissions inventory, this represents lower emissions of approximately 2 percent.

4.2.3.4 Emissions of Hazardous Air Pollutants

Emissions of a number of substances commonly called "hazardous air pollutants" (HAPs) are produced by a wide range of airport and non-airport sources, including (but not limited to) aircraft, ground support equipment, motor vehicles, home furnaces, evaporating fuel and paints, commercial and industrial facilities, wood burning, carpets, and dry-cleaning of clothing. The term HAPs refers to pollutants that do

not have established NAAQS but present potential adverse human health risks from short-term or long-term exposures. These substances are a subset of VOC and particulate emissions. Their effects and potential toxicity vary, and they have or are suspected to have impacts on human health, including risks of cancer, respiratory conditions, and other health effects. The substances referred to here include formaldehyde, acetaldehyde, benzene, and acrolein, among others. A list of aircraft and airport-related pollutants can be found in Table 1 of FAA's guidance document *Select Resource Materials and Annotated Bibliography on the Topic of Hazardous Air Pollutants Associated with Aircraft, Airports, and Aviation* (FAA, 2003).

In recent years, public and agency interest has increased regarding the effects of HAPS on human health. The influence of the proposed airport development project on the health of those living in the vicinity of airports cannot currently be quantified in a meaningful way. Given the limitations of the existing modeling tools and critical input data (e.g., HAPS emissions data and the HAP speciation profiles for commercial jet aircraft engines), it is not possible to prepare an accurate emissions inventory or a scientifically sound and defensible human health risk assessment.

The data in the EIS indicates that the proposed ADP project is likely to reduce HAPS emissions in the long-term. As a result of the crossfield taxiways and improved surface transportation (which decrease idle time of both aircraft and motor vehicles) in the proposed ADP, overall operational emissions of VOCs and particulates would decrease in comparison to the No-Action Alternative in 2015. The trends in HAPS emissions generally correlate with those for VOC and PM_{10} emissions. Emissions of individual HAPs due to the proposed project are therefore expected to decrease as well.

Since overall VOCs and particulate emissions would decrease between the No-Action and the ADP Alternatives in 2015, as a result of the crossfield taxiways and improved surface transportation, which decrease idle time of both aircraft and motor vehicles, emissions of individual HAPs due to the ADP Alternative are expected to decrease as well.

4.2.4 CONSTRUCTION EMISSIONS INVENTORY

4.2.4.1 No-Action Alternative

The No-Action Alternative would not involve construction activities connected with the ADP Alternative at PHX. There will continue to be construction activities ongoing at the airport that are not associated with the ADP Alternative. For example, Concourse S1 in Terminal 4 will be constructed as currently planned and approved. However, there would be some construction emissions generated in association with Terminal 2 modifications to accommodate remote gate busing operations. Fugitive dust resulting from internal building modification would be the largest emissions source. There is also the potential that asbestos abatement will be required as part of the Terminal 2 modifications. See Section 4.10.4 for a discussion of asbestos abatement measures.

4.2.4.2 Airport Development Program Alternative

The proposed construction schedule for projects included in the ADP is shown in Figure 4.2-1. The construction-related emissions inventory for the ADP Alternative was developed in accordance with this schedule and is summarized in Table 4.2.4-1. The construction period for this alternative is expected to occur over a seven-year period extending from 2008 to 2014. The results represent the sum of all construction emissions associated with each project per year and include emissions from heavy equipment, motor vehicles, and fugitive dust operations. For consistency with the Operational Emissions Inventory presented previously, the results are also expressed as tpy, by pollutant (i.e., CO, NO_x, PM_{10}, $PM_{2.5}$, and VOCs).

Table 4.2.4-1 contains the estimated construction-related annual emissions (in tons per year) of the pollutants for which the Phoenix area is designated as non-attainment, as well as $PM_{2.5}$. The maximum years of construction are in the 2009 to 2011 timeframe. Maximum emissions of CO (74 tpy), PM_{10} (12.6 tpy), and $PM_{2.5}$ (12.4 tpy) would occur in 2010, while maximum emissions of NOx (43 tpy) would occur in 2009, and maximum emissions of VOC (13 tpy) would occur in 2011.

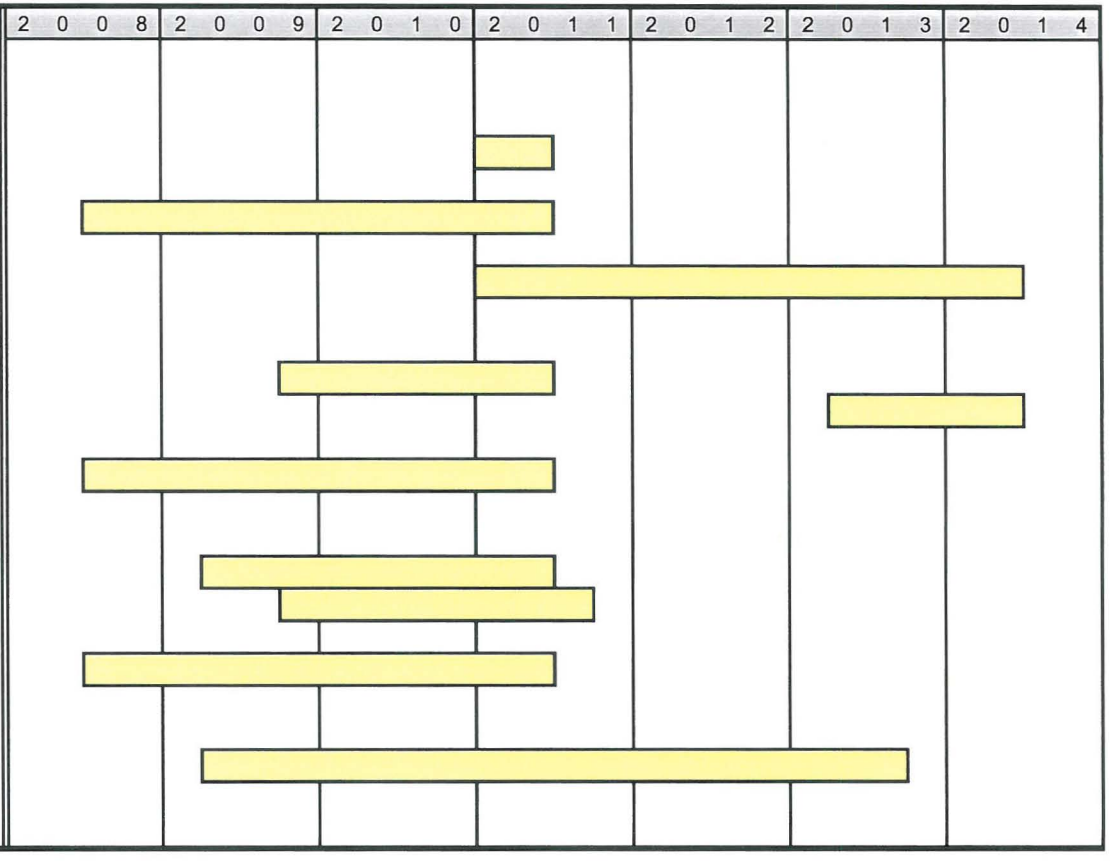
TABLE 4.2.4-1
CONSTRUCTION AIR EMISSIONS INVENTORY

Year	Pollutants (tpy)				
	CO	NO_x	PM_{10}	$PM_{2.5}$	VOC
2008	11	19	9.4	9.4	2
2009	47	43	12.5	12.4	4
2010	74	41	12.6	12.4	5
2011	48	28	11.2	11.1	13
2012	33	19	9.5	9.5	3
2013	16	10	8.4	8.3	2
2014	7	4	7.6	7.6	1

Source: Data derived by URS, 2004 and 2005
Notes:
VOC emissions are assumed to be equivalent to hydrocarbon (HC) emissions.
Construction Equipment (off-road) emissions were calculated from the NONROAD Model.
Fugitive dust emissions were based on AP-42 calculations.
On-Road motor vehicle emissions were calculated using the MOBILE6 model.

Figure 4.2-1
Potential ADP Alternative Construction Schedule

Project	Start Date	Finish Date
ADP Alternative		
Terminal 2 Demolition	Jan-11	Jun-11
West Terminal (18 Gates)	Jul-08	Jun-11
West Terminal (+15 Gates = 33 gates)	Jan-11	Jun-14
West Terminal Apron		
South	Oct-09	Jun-11
North	Mar-13	Jun-14
West Terminal Roadway	Jul-08	Jun-11
Crossfield Taxiways		
Taxiway "U"	Mar-09	Jul-11
Taxiway "V"	Oct-09	Sep-11
West Roadway	Jul-08	Jun-11
APM		
Stage 2	Mar-09	Sep-13



Source: City of Phoenix Aviation Department, 2005.

4.2.5 *GENERAL CONFORMITY RULE*

The metropolitan Phoenix area (including Maricopa County and PHX) has been designated as a serious nonattainment area for PM_{10}; and basic nonattainment for the 8-hour ozone standard, and attainment/maintenance for CO and the 1-hour ozone standard. As a result, ADEQ submitted a SIP for the area; the goals and objectives of which are to manage the growth of the pollutants and bring the area into attainment with the NAAQS[1]. A SIP for the 8-hour ozone standard is being developed by ADEQ.

Under the provisions of the CAA General Conformity Rule (40 CFR Part 93, Subpart B), Federal agencies are prohibited from approving, funding, or promoting any projects or actions that do not conform to the objectives and goals of the SIP. As previously stated, the General Conformity Rule stipulates that Federal actions or projects will not cause or contribute to any new violation of the NAAQS, increase the frequency or severity of any existing violation, and/or delay the timely attainment of the standards or other SIP milestones.

4.2.5.1 Applicability Criteria

As a means of determining whether or not the requirements of the General Conformity Rule apply, the EPA has established *de minimis* levels for the nonattainment/maintenance air pollutants. For the pollutant O_3, its precursors (i.e., VOCs and NO_x) are used as surrogates. As shown in **Table 4.2.5-1**, the applicable *de minimis* values for the area are 50 tpy for VOCs, 50 tpy for NO_x, 70 tpy for PM_{10}, and 100 tpy for CO. However, because EPA issued a NO_x waiver for Arizona in 1995, *de miminis* levels for NO_x do not apply under the current SIP. A NO_x waiver means that no further demonstration is required to show that these emissions conform to the SIP. Also, because the area around PHX is designated as an attainment area for $PM_{2.5}$, SO_x, and lead, no *de minimis* values apply to these criteria pollutants and no further discussion of these pollutants is needed with respect to General Conformity.

TABLE 4.2.5-1
GENERAL CONFORMITY *DE MINIMIS* LEVELS IN THE PHOENIX NONATTAINMENT AREA

Pollutant	*de minimis* Level (tpy)
VOC	50
NO_x	50*
PM_{10}	70
CO	100

Note: * Currently, EPA has given the state of Arizona a NO_x waiver. The potential NO_x emissions have been included.
Sources: 40 Code of Federal Regulations (CFR) Parts 6, 51, and 93, November 30, 1993; 40 CFR Part 52, April 19, 1995.

Under the applicability test, the sum of future "net project-related direct and indirect emissions" must be evaluated. Net project-related direct and indirect emissions include only those emissions that are explicitly created by the ADP Alternative, that are reasonably foreseeable, and are controllable by the Federal agency. These emissions are determined by subtracting the future No-Action emissions from the future Build emissions. Net project-related emission levels below the *de minimis* thresholds are

[1] Maricopa County was designated as "serious nonattainment" for the CO, 1-hour O_3, and PM-10 NAAQS. In June 2004, the area was also designated "nonattainment" for the new 8-hour O_3 standard. In April 2005, EPA determined that the area meets the CO NAAQS and the area was classified as maintenance for CO. On June 14, 2005, the area was designated maintenance for the 1-hour ozone standard.

presumed to conform to the SIP and the General Conformity Rule is not applicable. However, when the net project-related direct and indirect emissions exceed the *de minimis* levels, the General Conformity Rule does apply. In these cases, further demonstration must be made in a formal General Conformity Determination to show that the project conforms to the applicable SIP before the Federal agency is allowed to approve and/or fund the project or action.

Based on this approach, the outcomes of the General Conformity Rule applicability test for operational and construction-period emissions are discussed by alternative.

4.2.5.2 Operational Emissions Applicability Test

The information and data used in support of this analysis was obtained from the operational emissions inventory results presented previously in Table 4.2.3-1. Although the crossfield taxiways are scheduled to become operational in 2012, the quantitative estimate of emissions for use in this FEIS used the FAA approved 2015 forecast of aviation activity. The 2015 forecast, with its greater number of aircraft operations, should provide a conservative estimate of operational emissions. Based on preliminary estimates the taxiways should improve overall taxi times, which in turn would reduce emissions. Therefore, based on the proposed construction schedule (2008-2014), it was assumed that project-record operational emissions (those associated with the operation of the airport) for the ADP Alternative would not occur until the projects are fully developed (in 2015).

The total amounts of PHX operational emissions of the pollutants are tabulated in Table 4.2.5-2 for both the 2015 No-Action Alternative and the ADP Alternative. As shown, there would be a net reduction in emissions for these pollutants as follows: -217 tpy for CO; -42 tpy for NO_X; -3 tpy for PM_{10}; and -37 tpy for VOCs.

TABLE 4.2.5-2
***DE MINIMIS* COMPARISON OF 2015 OPERATIONAL EMISSIONS**

Conditions	Pollutants (tpy)			
	CO	NO_X	PM_{10}	VOC
No-Action Alternative	11,301	2,513	111	1,187
ADP Alternative	11,084	2,471	108	1,150
Change in Project Emissions with ADP Alternative	-217	-42	-3	-37
Applicable *de minimis* Levels	100	50	70	50

Source: URS Corporation, 2004 and 2005.

4.2.5.3 Construction Period Emissions Applicability Test

The information and data used in this analysis was obtained from the construction period emissions inventory results presented previously in Table 4.2.4-1. The maximum annual total amounts of construction emissions associated with the ADP Alternative are shown in Table 4.2.5-3.

TABLE 4.2.5-3
MAXIMUM ANNUAL CONSTRUCTION EMISSIONS FOR THE ADP ALTERNATIVE

Years	Pollutants (tpy)			
	CO	NO_X	PM_{10}	VOC
2009	47	43	12.5	4
2010	74	41	12.6	5
2011	48	28	11.2	13
Applicable *de minimis* Levels	100	50	70	50

Note: Only the three highest years of emissions are shown in this table. These years correspond with the period when construction activities with the ADP Alternative will be the greatest, thereby resulting in the highest levels. Additional years are shown in Table 4.2.4-1.
Source: URS Corporation, 2004 and 2005.

4.2.5.4 Conformity Assessment

As shown in Table 4.2.5-4, the changes in pollutant emissions in 2015 due to routine operations of the ADP Alternative are less than the General Conformity *de minimis* thresholds. When compared to the No-Action Alternative, the changes in emissions show decreases in emissions for the ADP Alternative, an improvement in conditions when compared to the status quo.

Compliance with the General Conformity Rule also requires that pollutant emissions due to construction activities are addressed. As presented in Table 4.2.5-4, the sum of project-related construction and operational emissions for each year, from 2008 through 2015, are all below the *de minimis* thresholds of the General Conformity Rule. It is anticipated that none of the proposed improvements will be fully operational during the construction period (2008-2014). Therefore, the conservative assumption was made that there will be no changes in project-related emissions during this period.

TABLE 4.2.5-4
ANNUAL PROJECT-RELATED CONSTRUCTION AND OPERATIONAL EMISSIONS FOR THE ADP ALTERNATIVE (tpy)

Pollutant	2008	2009	2010	2011	2012	2013	2014	2015
Carbon Monoxide								
- Construction Activities	11	47	74	48	33	16	7	0
- Operations	0	0	0	0	0	0	0	-217
Total CO Emissions	11	47	74	48	33	16	7	-217
Applicable *de minimis* Level	100	100	100	100	100	100	100	100
Nitrogen Oxides								
- Construction Activities	19	43	41	28	19	10	4	0
- Operations	0	0	0	0	0	0	0	-43
Total NOx Emissions	19	43	41	28	19	10	4	-43
Applicable *de minimis* Level	50	50	50	50	50	50	50	50
Particulate Matter - 10 Microns								
- Construction Activities	9.4	12.5	12.6	11.2	9.5	8.4	7.6	0
- Operations	0	0	0	0	0	0	0	-3
Total PM_{10} Emissions	9.4	12.5	12.6	11.2	9.5	8.4	7.6	-3
Applicable *de minimis* Level	70	70	70	70	70	70	70	70
Volatile Organic Compounds								
- Construction Activities	2	4	5	13	3	2	1	0
- Operations	0	0	0	0	0	0	0	-37
Total VOC Emissions	2	4	5	13	3	2	1	-37
Applicable *de minimis* Level	50	50	50	50	50	50	50	50

Source: Data derived by URS Corporation, 2004 and 2005.

According to the General Conformity Rule, a regionally significant action/project is a Federal project or action with total direct and indirect emissions greater than 10 percent of the emissions inventory for the nonattainment area. If a project is determined to be regionally significant, a General Conformity Determination must be prepared. As shown in **Table 4.2.5-5**, total PHX project-related emissions show a decrease in emissions. Total PHX project-related construction emissions are presented in **Table 4.2.5-6** and are also less than 10 percent of the emissions inventory for the nonattainment area. Thus, the increases in project-related emissions are less than 10 percent of the Maricopa County emissions for all pollutants. It is, therefore, concluded that the planned improvements to PHX are not regionally significant and conform to the goals and requirements of the CAA and the SIP. Thus, FAA has met the requirements of the General Conformity Rule.

TABLE 4.2.5-5
PHX EMISSIONS COMPARED TO REGIONAL EMISSIONS (tpy)

Source	CO	NOx	PM_{10}	VOCs
Maricopa County Emissions[1]	173,467	107,503	82,161	52,339
Emissions generated from PHX Build Alternative[2]	-217	-42	-3	-37
Percent of Regional Total	-0.13%	-0.04%	-0.004%	-0.07%

[1] Taken from the Maricopa.Gov website for Periodic Emission Inventories. (Accessed April 2005).
[2] Emissions associated with airport projects for the ADP Alternative (No Build - Build).
Sources: URS Corporation, 2005; MCESD, Maricopa County Periodic Emission Inventories for CO, O_3, and PM (June 2004).

TABLE 4.2.5-6
PHX CONSTRUCTION-RELATED EMISSIONS COMPARED TO REGIONAL EMISSIONS (tpy)

Source	CO	NO_x	PM_{10}	VOCs
Maricopa County Construction Emissions[1]	15,585	9,835	859	1,786
Maximum Construction Emissions from All PHX Projects Between 2008-2014[2]	74	43	12.6	13
Percent of Regional Total	0.5%	0.4%	1.5%	0.7%

1 Includes all construction-related emissions (tpy) in Maricopa County.
2 Includes all construction emissions (tpy) associated with airport projects for the ADP Alternative.
Sources: URS Corporation, 2005 (for PHX construction-related); MCESD, Maricopa County Periodic Emission Inventories for CO, Ozone and PM (June 2004).

4.2.5.5 Transportation Conformity

Off-site airport-related motor vehicle traffic traveling to and from PHX is inherently integrated with all of the non-airport traffic operating on the same highways and roadways. Therefore, this airport traffic is already included in the regional transportation system Traffic Demand Model for the Phoenix area. The emissions associated with these vehicles are already accounted for in the TIP for Maricopa County (MAG, 2003). Additionally, there are no roadway improvements associated with the ADP Alternative which are funded or approved by the FHWA/FTA. As a result the Transportation Conformity Rule does not apply.

4.2.6 OTHER AIR PERMITS

There are a number of other air quality permits and regulatory requirements that would apply to the proposed ADP Alternative. These are briefly discussed as follows:

Stationary Sources

The planned West Terminal Complex is the only component of the ADP Alternative that would likely involve the operation of a heating plant. As a stationary source of air emissions, the facility would be permitted separately from this FEIS by the City of Phoenix.

Dust Control

Activities, specifically including construction, which disturb more than 0.1 acre (4,356 sf) of surface area are subject to MCESD Rule 310: *Control of Air Contaminants - Fugitive Dust Sources*. Among the requirements of Rule 310 are an Earthmoving Permit, a Dust Control Plan, adequate dust control measures and a Daily Log. Permits must be obtained prior to any disturbance of surface soil and be displayed at the site. Permits must be renewed annually if the project lasts for more than 1 year.

Permit for Emergency Generator

If the emergency generator proposed for the West Terminal Complex exceeds the definitions for a standby emergency generator (operated at or below 500 hours per year and do not exceed 4,000 pounds of NO_x or CO emissions per year), then the provisions of MCESD Rule 200 Section 303 for a Non-Title V installation, operating and/or operational permit for new stationary sources would apply.

Asbestos Notification

For all demolitions, even when no asbestos is present, and renovations involving threshold amounts of regulated asbestos-containing material (RACM), it is required to provide the National Emissions Standards for Hazardous Air Pollutants (NESHAP) agency (e.g., MCESD) overseeing the job site with written notice of intention to demolish or renovate at least 10 working days prior to the activity.

The Air Quality Division of the MCESD issues air quality permits for ADEQ in Maricopa County. Should any other stationary sources of emissions be added to the ADP Alternative that require air pollution construction and operating permits from MCESD, these permits would be applied for by the City of Phoenix, as the owner/operator, or the contractor.

4.2.7 POTENTIAL MITIGATION MEASURES

Air pollution minimization and mitigation measures that are already in place at PHX or are being considered for implementation as part of the ADP Alternative at the airport are discussed in Chapter 5.0, Mitigation, of this FEIS. These apply to both the construction and operational phases of the projects to further minimize the impacts to air quality.

4.2.8 GOVERNOR'S CERTIFICATION OF REASONABLE ASSURANCE (GOVERNOR'S CERTIFICATE)

This certification, formerly required under the Airport and Airway Improvement Act of 1982, was eliminated by Congress in Vision 100 (P.L. 108-176, Section 305) in December 2003 and is no longer required.

4.3 COASTAL RESOURCES

4.3.1 OVERVIEW OF IMPACTS

There are no areas within Maricopa County or the State of Arizona that have been designated as coastal zones pursuant to the Coastal Zone Management Act of 1972 (CZMA). Arizona does not have an approved Coastal Zone Management Plan. No portion of Maricopa County is included as a designated unit within the Coastal Barrier Resources System. Therefore, it was concluded that implementation of the ADP Alternative would not result in impacts within either coastal management zone or coastal barrier resources.

4.4 COMPATIBLE LAND USE

4.4.1 OVERVIEW OF IMPACTS

Under the No-Action Alternative, there would be no changes in off-airport land use within the study area other than those resulting from the continuation of routine airport operations. There would be no increase or change in the level of impacts to off-airport land use in the area.

The proposed improvements associated with the ADP Alternative would have a minor effect upon off-airport land use. Most of the improvements associated with the proposed ADP Alternative would be constructed on airport property. Development of the APM Stage 2 and the connection to the LRT and APM maintenance facility would require the acquisition and conversion of

approximately 16.4 acres of privately held property to airport use. The project site is surrounded by other airport, commercial, and light industrial land uses. Potential impacts associated with the relocation of businesses and facilities are discussed in Section 4.15. Noise levels due to the improvements would not differ at all compared to the No-Action Alternative and are not expected to result in new noise impacts to noise sensitive areas. Changes to land use would be minimal and result from the conversion and redevelopment of existing facilities to airport uses. This conversion could affect prehistoric Hohokam archaeological sites [Pueblo Grande/AZ U:9:1(ASM) and AZ U:9:28(ASM)] that are eligible for the National Register for their potential to yield important information (Criterion D). Those impacts would be addressed in accordance with a Section 106 Memorandum of Agreement (MOA), as discussed in Section 4.11. The conversion also may need to address some areas of existing environmental contamination.

The FAA has consulted with the State Historic Preservation Office concerning impacts to historic architectural, cultural and archaeological resources. Results of the consultation are presented in Section 4.11 of this FEIS. The potential involvement of environmentally contaminated sites is discussed in Section 4.10 of this FEIS.

4.4.2 METHODOLOGY

The land use analysis considered existing and future land use plans from the jurisdictions within the GSA along with the various environmental analyses conducted in conjunction with the study. Parameters evaluated included changes in land use as a result of noise levels and property acquisition. Details regarding the environmental analyses for these and other environmental resource categories are provided in the applicable methodology discussion for each resource category in this chapter.

4.4.3 YEAR 2015 IMPACT POTENTIAL

4.4.3.1 No-Action Alternative

Construction of the ADP Alternative would not occur under this alternative; therefore, the No-Action Alternative would not result in direct land use impacts. Refer to Section 4.14 of this FEIS for a discussion of compatible land use associated with aircraft noise impacts (indirect impacts) associated with the No-Action Alternative.

4.4.3.2 Airport Development Program Alternative

Off-Airport Land Use - The proposed ADP Alternative would not have a significant impact upon off-airport land uses in the vicinity of the airport when compared to the No-Action Alternative. Development patterns in the area are well established and would not be affected by the improvements. The majority of development actions being proposed are confined to the existing airport and would not significantly affect surface transportation, result in community disruption or long-term impacts to businesses. Development of the APM Stage 2 would result in the acquisition of approximately 16.4 acres (92 parcels) of property. This acquisition is required to provide property for the right-of-way and construction of the APM maintenance building and APM Station at 44th Street (see Figure 4.4-1). Development of the APM Stage 2 would potentially convert the land use to public/quasi-public as characterized by the City of Phoenix (2004). Land uses impacted by the proposed action include commercial and light industrial. No residential land uses would be converted. Any land acquisition and relocation would be performed in

accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

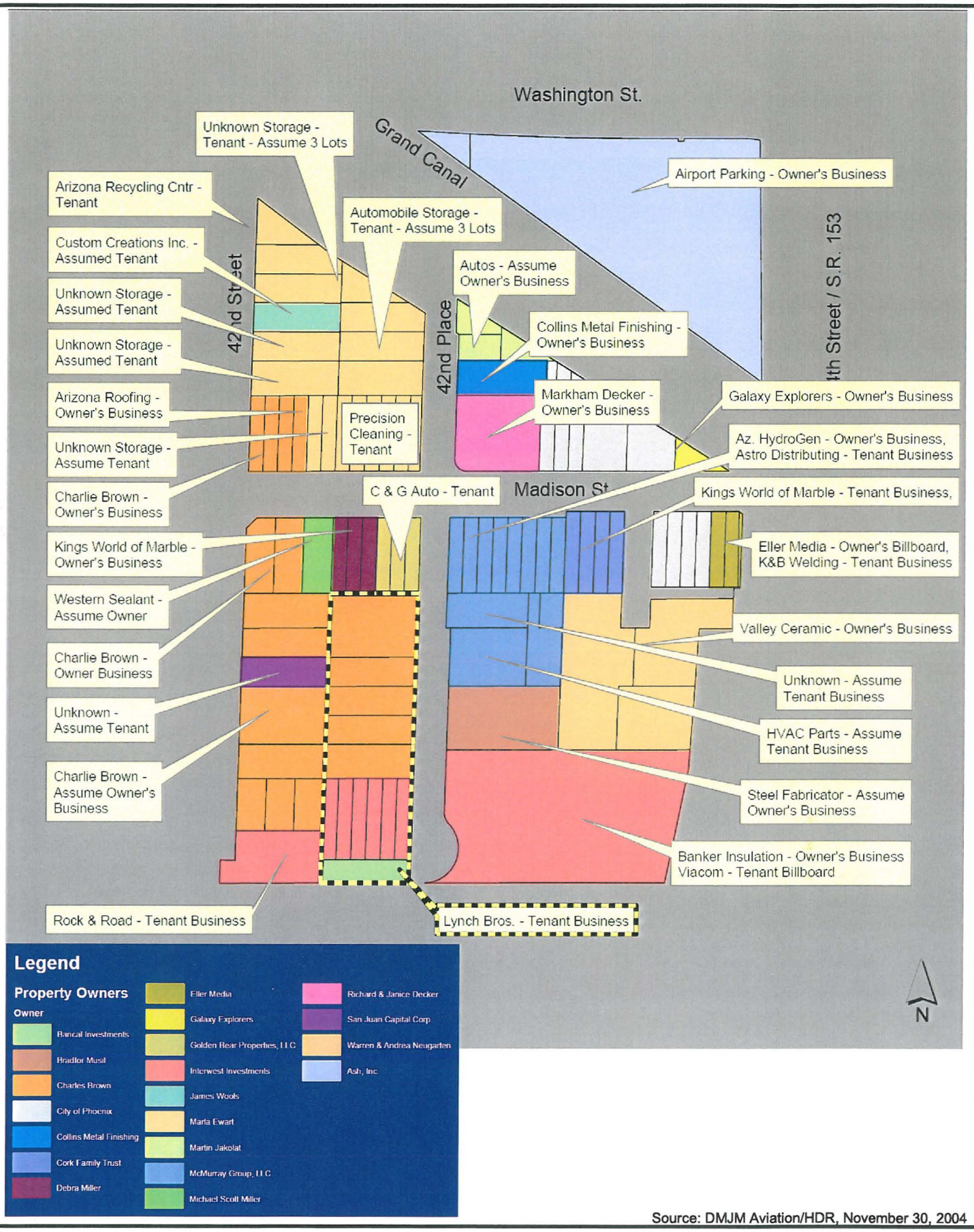
Projected aircraft noise levels are not expected to differ from the No-Action Alternative. Section 4.14 of this FEIS provides a detailed analysis of compatible land use associated with aircraft noise impacts (indirect impacts) associated with the ADP Alternative.

PHX, in accordance with Section 511(a)(5) of the Airport and Airway Improvement Act of 1982, coordinates with local governments to promote existing and future compatible land use in the vicinity of the airport. This assurance relates to existing and planned land use and involves the adoption of zoning laws and other measures, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations. A letter confirming this assurance has been provided by the City of Phoenix and contained in Appendix A of this FEIS.

On-Airport Land Use - The changes to on-airport land use relate to the redevelopment of previously developed airport property. The areas to be redeveloped include existing terminal, cargo, parking, and warehousing facilities. Redevelopment would also include roadway realignments and routing. Because the majority of the airport site proposed for construction of the West Terminal and associated projects has been previously developed for airport use, there would be no substantial on-airport land use impacts. All potential impacts relative to these and other impacts on the airport would be coordinated through the appropriate agencies and properly mitigated, as described in each specific environmental impact category.

4.4.4 POTENTIAL MITIGATION MEASURES

There would be no significant land use impacts off-airport property and therefore land use mitigation measures are not warranted. Acquisition of property would result in the potential relocation of 14 property owner-operated businesses (including two billboards) and 17 tenant-run businesses. These acquisitions would be mitigated in accordance with applicable Federal requirements (see Section 4.15).



Source: DMJM Aviation/HDR, November 30, 2004

Phoenix Sky Harbor INTERNATIONAL AIRPORT
Environmental Impact Statement

ADP Alternative Off-Airport Land Use Impact

FIGURE 4.4-1

c:\ 516\rje\c1 375-GIS Data 2\IG\Phoenix els\Applications\aprlphx els 2\Layout: Figure 4.4-1, ADP Alternative Off-Airport Land Use Impact).rpf, 12/07/04

4.5 CONSTRUCTION IMPACTS

4.5.1 OVERVIEW OF IMPACTS

Under the No-Action Alternative, there would be some construction-related impacts resulting from the renovation and conversion of Terminal 2 to accommodate remote gate hardstand operations. The No-Action Alternative construction impacts in Terminal 2 include a short-term increase in solid waste production and hazardous waste generation resulting from asbestos abatement. Construction impacts resulting from the implementation of the ADP Alternative at PHX would include temporary and unavoidable impacts related to noise, air quality, water quality, solid waste, hazardous waste, and traffic congestion. These impacts would be temporary and would be minimized through the establishment and use of environmental controls (such as Best Management Practices (BMPs) and adherence to Federal, state and local construction guidelines.

All on-airport construction activities would adhere to FAA Advisory Circular (AC) 150/5370-10B, *Standards for Specifying Construction at Airports,* and Federal, state, and local permitting requirements for construction activities. All contractors performing work at the airport are required to comply with the City of Phoenix's AZPDES Construction General Permit. The City of Phoenix Aviation Department performs routine surveillance during construction to document this compliance.

4.5.2 METHODOLOGY

In accordance with FAA Order 5050.4A, "Specific effects during construction which may create adverse impacts include noise of construction equipment on the site, noise and dust from delivery of materials through residential streets, creation of borrow pits and disposal of spoil, air pollution from burning debris, and water pollution from erosion. The extent to which any of these effects are subject to local, state, or Federal ordinances or regulations shall be discussed as applicable together with measures to be taken to conform with such requirements." The proposed construction activities as proposed by the City have been evaluated for each of the resource categories identified in FAA Order 5050.4A.[1]

In addition to the specific impact categories identified in FAA Order 5050.4A, construction-related impacts pertaining to solid and hazardous waste generation and surface transportation issues were also considered. Construction related impacts pertaining to these issues are discussed in Sections 4.10 and 4.20, respectively.

4.5.2.1 Anticipated Construction Activities

No-Action Alternative

Under the No-Action Alternative, modifications would be made to Terminal 2 to upgrade existing out-of-date and obsolete facilities and to convert the terminal to an airfield bus terminal to serve remote aircraft parking positions. In addition, facilities in Terminal 3 would be upgraded to accommodate the existing contact gate positions as well as remote aircraft parking positions for ADG IIIa and smaller aircraft.

[1] Section 4.5.3 provides a discussion of the impact analysis for the No-Action and ADP Alternatives. Additional detail and discussion on construction-related impacts for resource categories such as air quality, noise, stormwater, etc., are contained within their respective sections of Chapter 4.0.

Airport Development Program Alternative

The ADP Alternative would involve the construction of the West Terminal, realignment of Sky Harbor Boulevard, construction of new crossfield taxiways, development of the APM Stage 2, and modifications to Terminal 4, Concourse N4. Most construction is expected to occur from 2007 through 2014. Figure 4.2-1 illustrates the proposed phasing of construction activities relating to implementation of the ADP Alternative.

4.5.3 Year 2015 Impact Potential

4.5.3.1 No-Action Alternative

Construction activities required under the No-Action Alternative would be largely confined to the interior areas of Terminal 2 and a portion of Terminal 3. Therefore, noise and water quality impacts, and impacts to surface transportation would not occur. Physical modifications to Terminal 2 would be complicated by the presence of large amounts of asbestos containing materials (ACM). Removal and proper disposal of these materials would be required. Asbestos abatement activities would be performed in compliance with Section 112 of the Clean Air Act, Arizona Administrative Code R18-2-1101, and all other applicable Federal, state, and local regulations.

Renovation and construction activities in Terminals 2 and 3 would generate additional solid wastes above that generated through routine terminal operations. Examples of construction-related solid wastes include empty construction supply containers, discarded shipping pallets, excess concrete batches (from concrete mixer trucks), conduit, and excess electrical wiring materials. These construction materials would be transferred to a local transfer station for sorting and potentially to the Southwest Regional, Queen Creek, Northwest Regional, or Butterfield Station landfills for proper disposal.

4.5.3.2 Airport Development Program Alternative

In general, the project site is located on airport property, and the ADP Alternative is for the development of facilities required for the operation of the airport. Development of the APM Stage 2 would require the acquisition of 16.4 acres of offsite property. This property, which is currently in business and light industrial land use, will be converted to airport use. The construction activities associated with the ADP Alternative could result in temporary adverse impacts in terms of noise, air quality, water quality, surface transportation, solid waste generation, and hazardous materials. Temporary increases in noise associated with construction would affect only the immediate project area, which is completely within the airport property or right-of-way and within an area designated for airport-related or compatible use. Construction noise would temporarily increase ambient noise levels in the immediate vicinity of the construction activity. There are no residences or other sensitive receptors located within the immediate vicinity of the ADP Alternative. Because distance rapidly attenuates noise levels, noise experienced by area residents would result in only a slight increase in ambient background conditions. There will be no

change to airport noise levels as a result of the ADP Alternative. The 65 DNL noise contour would not change and no site would experience an increase in noise of 1.5 db or more.

The potential effects of construction of the ADP Alternative on air quality are discussed in Section 4.2 of this FEIS. Temporary reductions in air quality due to emissions from construction equipment and fugitive dust from construction and excavation areas would be minimized through the enforcement of the terms and conditions of an Excavation and Dust Prevention Permit that would be issued by Maricopa County prior to the start of construction. Particulate pollution would be minimized by treating excavated areas with water and not allowing burning during unfavorable weather conditions.

Because soil erosion by wind and surface water represents a potential for short-term and temporary impacts, procedures outlined by FAA AC 150/5370-10B, *Standards for Specifying Construction of Airports* and the USDA Natural Resource Conservation Service's *Erosion Handbook - Water and Wind* can be used to minimize impacts. The construction documents incorporate measures to address soil erosion, revegetation, sediment control, and the protection of surface water quality. Turbidity that could occur during the construction period when excavated areas are exposed would be mitigated by controls implemented prior to construction such as straw or baled hay barriers used in conjunction with silt curtains. The City of Phoenix would perform construction activities in accordance with the existing AZPDES construction general permit and will obtain all additional required permits.

The servicing of heavy construction equipment would require the storage and dispensing of oil, gasoline, greases, and solvents. Therefore, maintenance and repair of such equipment would be confined to areas specifically designed for that purpose, such as the construction contractor's staging area. When equipment servicing is not conducted in these designated areas, special care would be taken to ensure that these potential pollutants do not wash into surface water drainage channels. All construction would be in compliance with a stormwater management plan developed by the contractor prior to the initiation of construction.

Development of the ADP Alternative at PHX may require the closure and rerouting of traffic along Sky Harbor Boulevard and adjacent roadways to accommodate construction. To the extent practicable, lane closures could occur at night from approximately 10:00 p.m. to 6:00 a.m. The scheduling of roadway construction activities could be designed to minimize on-airport traffic impacts during times of normal peak airport activity.

The demolition of Terminal 2 would result in the generation of hazardous waste through the removal of ACM present in the building. All ACM would be removed prior to demolition and would be performed following development and regulatory approval of a Terminal 2 Asbestos Abatement Plan. See Section 4.10 for construction-related waste.

4.5.4 Potential Mitigation Measures

Construction impacts would be short-term and temporary in nature and would be discontinued after the ADP Alternative projects are completed. Specific BMPs should ensure potential construction impacts are minimized and/or avoided. See Chapter 5.0 for mitigation measures proposed for the ADP Alternative.

4.6 DEPARTMENT OF TRANSPORTATION SECTION 4(f)

4.6.1 OVERVIEW OF IMPACTS

Under the No-Action Alternative, there would be no use of Section 4(f) resources.

The ADP Alternative would not directly or constructively use any publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance. Although the ADP Alternative does have the potential to impact land of a historic site of national, State, or local significance, the ADP alternative would not result in a physical or constructive use. Six historic Section 4(f) resources were identified within the area of potential effects of the ADP Alternative. If the ADP Alternative were selected, *The Phoenix*, a historic mural by Paul Coze installed in the Terminal 2 lobby, would be removed before the terminal is demolished, and be mounted elsewhere in a public space on the airport. The mural is owned by and would remain in the ownership of the City of Phoenix. The relocation of the mural would not substantially impair its values as a historic art object and not constitute a Section 4(f) physical or constructive use.

The Stage 2 - East APM would cross beneath the historic Phoenix main line of the Southern Pacific Railroad using the existing bridge that carries the railroad over the depressed Sky Harbor Expressway (SR 153). The Stage 2 - East APM would span the historic Grand Canal on an elevated structure. The project would not acquire land from the canal or railroad right-of-way and would not substantially diminish their historic values and ongoing uses. Therefore, the crossings of the canal and railroad would not be a Section 4(f) physical or constructive use.

The elevated sections of the Stage 2 - East APM facilities would be visible from the historic Sacred Heart Church, Tovrea Castle, and the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park. The Sacred Heart Church is about one-half mile from the closest proposed elevated section of the Stage 2 APM, and the Tovrea Castle is about one mile away. The project would not substantially alter the settings of these properties. The northern elevated section of the Stage 2 - East APM guideways, station, and the APM maintenance and control facility would be within 250 to 1,000 feet of the western edge of Pueblo Grande Museum and Archaeological Park. Sensitive design of elevated portions of the Stage 2 - East APM facilities in the vicinity of the park would minimize any incompatible visual intrusions and avoid any substantial impairment of the use of the park. The FAA in consultation with the SHPO determined that a sensitive and compatible design will avoid adverse visual effect to the Pueblo Grande Museum and Archaeological Park. The ADP Alternative would not result in a Section 4(f) physical or constructive use of the Sacred Heart Church, Tovrea Castle, or Pueblo Grande Museum and Archaeological Park.

4.6.2 METHODOLOGY

Section 4(f) of the Department of Transportation Act of 1966, as amended, [49 USC 303(c)] provides that the U.S. Department of Transportation may not approve the use of publicly owned lands of a public park, recreation area, wildlife and wildfowl refuge of National, state, or local significance, or any historic site of National, state, or local significance unless a determination is made that:

- There is no feasible and prudent alternative to the use of land from the property; and
- The action includes all possible planning to minimize harm to the property resulting from such use.

Impacts on Section 4(f) resources are categorized as involving a "use" or "constructive use" of such resources (Title 23, CFR, Part 771.135(p)). FAA uses the Federal Highway Regulations as guidelines when assessing use for Section 4(f) purposes. A Section 4(f) use occurs when land is permanently incorporated into a transportation facility, or there is a temporary occupancy of land that is adverse in terms of the statute's preservationist purposes. A Section 4(f) constructive use occurs when there are adverse indirect impacts that would substantially impair the significance or enjoyment of the Section 4(f) resources. For example, a constructive use can occur when one or more of the following conditions apply:

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

The following criteria, based on 23 CFR 771.135(p), were applied to evaluate whether the ADP Alternative would result in a use of a Section 4(f) resource:

- Would land need to be acquired from a Section 4(f) resource?
- Would increased noise levels substantially affect a Section 4(f) resource?
- Would visual intrusions substantially impair a Section 4(f) resource?
- Would construction or operation vibrations substantially damage a Section 4(f) resource?
- Would access to a Section 4(f) resource be restricted?

Based on conceptual design and layout of the ADP Alternative, determinations of Section 4(f) applicability, uses, and constructive uses were assessed.

4.6.3 YEAR 2015 IMPACT POTENTIAL

4.6.3.1 No Action Alternative

No impacts would occur to Section 4(f) resources under the No-Action Alternative.

4.6.3.2 Airport Development Program Alternative

The ADP Alternative would not directly or constructively use any publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance. Although the ADP Alternative does have the potential to impact land of a historic site of national, state, or local significance, the ADP alternative would not result in a physical or constructive use to any of these sites.

Park Resources

No impacts would occur to Section 4(f) park resources under the ADP Alternative. As discussed in Section 3.8.1, there are approximately 30 parks located within the GSA. Results of the point source noise analysis performed for the ADP Alternative indicate that no Section 4(f) resources would be subject to an increase in noise levels greater than 1.5 dB (see Section 4.14.3.1 and Appendix B). Therefore, noise would not represent a constructive use of any park resource.

Construction impacts relating to development of the ADP Alternative would not represent a constructive use of any park facilities. All construction activities would be performed on or in close proximity to airport property.

With the exception of the proposed APM station to be located in the northeast corner of the airport, light and visual impacts associated with development of the ADP Alternative would be restricted to onsite locations or would be integrated into the existing visual and light environment at the airport. Design and construction of the APM station would incorporate context-sensitive design techniques to minimize and mitigate any potential impacts to park facilities in the project area.

Historic Resources

Historic sites protected by Section 4(f) were identified in conjunction with cultural resource studies conducted to support compliance with Section 106 of the National Historic Preservation Act (refer to Section 3.9). Six historic Section 4(f) resources were identified within the area of potential effects defined for the Section 106 analysis of the ADP Alternative (Table 4.6.3-1). They include an art object, two historic buildings, a historic canal, a historic railroad, and an archaeological museum and park. The project impacts on these resources are discussed in the following paragraphs. (See Appendix C for additional information about these resources). The potential impacts of the project on the historic integrity and historic value would not diminish the visitor use of the properties studied.

The ADP Alternative would involve moving *The Phoenix* mural from Terminal 2 before it is demolished, and remounting the mural in another public space on the airport. In contrast to a historical building or structure, the mural is an inherently moveable object of art, and its historical artistic values are not based in the particular location in which it is currently displayed. The FAA, in consultation with the SHPO, concluded that moving the mural to another location at the airport would not adversely affect the historic values that make the mural eligible for the National Register. Therefore, the FAA has determined that the ADP Alternative would not result in a Section 4(f) physical or constructive use of the mural because its historic qualities and integrity would not be substantially impaired.

The ADP Alternative would result in the Stage 2 - East APM spanning the Grand Canal on an elevated guideway, and a station would be built at the terminus of the guideway on the north side of the canal. An APM maintenance and control facility would be constructed south of the canal. An easement is required to cross the canal, which is owned by the Federal government and administered by the Bureau of Reclamation, but no land within the right-of-way of the canal would be acquired and the use of the canal would not be affected. The APM facilities would alter the setting of this section of the Grand Canal, but the original rural agricultural landscape was converted to urban uses decades ago. The visual changes in the current commercial and light industrial setting of the canal would not substantially diminish the historic values of the canal, and therefore would not be a Section 4(f) physical or constructive use.

TABLE 4.6.3-1
IMPACTS ON HISTORIC SECTION 4(f) RESOURCES

	Name	Location	Description	Status	Impact
Within the Area of Potential Effect for Construction Impacts					
1	*The Phoenix,* a mural by Paul Coze	2908 E. Sky Harbor Blvd., in Terminal 2	Art object created in 1962	National Register eligible, Criterion C	To be relocated, not a use or physical or constructive use.
2	Grand Canal	South of Washington St., Stage 2 - East APM corridor	Historic canal built in 1878	National Register eligible, Criterion A	APM Stage 2-East would cross over canal on an elevated structure, not a use or physical or constructive use.
3	Phoenix Main Line of Southern Pacific Railroad (now Union Pacific)	South of Jackson St. Stage 2 - East APM corridor	Historic railroad built in 1924-1926	National Register eligible, Criterion A	APM Stage 2 - East would cross beneath railroad under existing bridgel, not a use or physical or constructive use.
Within the Area of Potential Effect for Visual Impacts					
4	Sacred Heart Church	900 S. 17th Street,	1956	National Register eligible, Criterion A	Minor change to visual setting, not a use or physical or constructive use.
5	Pueblo Grande Museum and Archaeological Park	4619 E. Washington St., east of Stage 2 - East APM corridor	Prehistoric ruin	National Register National Historic Landmark listed, Criteria A and D; eligible, Criterion C; city register and city park National Historic Landmark	Change in visual setting to be minimized through sensitive design, not a use or physical or constructive use.
6	Tovrea Castle (El Castillo)	5041 E. Van Buren St., about 1 mile northeast of Stage 2 - East APM corridor	Four-story, folk art tower built in 1928-1930	National Register listed, Criteria A and C	Minor change to visual setting, not a use or constructive use.

Sources: City of Phoenix Aviation Department files, State Historic Preservation Office files, City Historic Preservation Office files; refer to Appendix C for more details.

The ADP Alternative would result in the Stage 2 - East APM crossing beneath the historic Phoenix main line of the Southern Pacific Railroad using the existing bridge that carries the railroad over the depressed Sky Harbor Expressway (SR 153), and an APM maintenance and control facility would be built north of the tracks. The Union Pacific Railroad continues to operate the line, which has the appearance of a modern railroad. There are no historic materials at this location, and the setting of the railroad has been

highly altered by urban development. No land within the right-of-way of the railroad would be acquired and the use of the line would not be affected. The changes to the visual setting would not substantially impair the historic value of the railroad, and, therefore, would not be a Section 4(f) physical or constructive use.

The ADP Alternative would not require acquisition of land from the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park. Potential for construction-induced ground vibration to damage the archaeological ruin within the park was evaluated. A previous study recommended restricting use of heavy equipment within 150 feet of the platform mound and remnants of the surrounding residential compound. The Stage 2 - East APM would be no closer than approximately 1,000 feet of this restricted zone, and therefore, construction-induced ground vibration is not expected to threaten the ruin. If construction requires blasting, pile driving, or other techniques that might create high levels of vibration, the potential impact would be reassessed, and if warranted, a vibration abatement and monitoring program would be implemented to avoid damage to the ruin.

The elevated Stage 2 – East APM station at the Valley Metro Rail Light Rail Transit interconnection and approximately 1,500 feet of elevated APM guideway to the south would be visible from some locations within the Pueblo Grande Museum and Archaeological Park across the Sky Harbor Expressway (SR 153). The APM station has yet to be designed, but it could be the equivalent of a two- to four-story building or taller. The guideway structure for the elevated section south of the station also has yet to be designed, but is expected to be approximately 11 feet deep and a maximum of approximately 27 feet above the existing grade. After crossing the Grand Canal, the elevated section of the APM would descend below grade approximately 250 feet north of the Union Pacific Railroad.

An APM maintenance and control facility would be built on the west side of Sky Harbor Expressway between the canal and railroad, replacing commercial and light industrial buildings that currently occupy the area. This facility also has yet to be designed, but is unlikely to be substantially taller than the elevated guideway. The APM maintenance and control facility and the elevated guideway and station at the north end of the APM corridor would be within approximately 250 to 1,000 feet of the western boundary of the park.

Approximately 3,000 feet south of the railroad, the APM would rise above grade, and approximately 1,000 feet of the guideway would be elevated until reaching the East Economy Parking Garage. The top of this section of the guideway would be approximately 45 feet above Sky Harbor Boulevard, which is depressed below normal grade at this location at the eastern end of the airport. This elevated segment would be within approximately 1,000 feet of the southern boundary of the Pueblo Grande Museum and Archaeological Park.

The size of the park (more than 100 acres) and use of sensitively designed museum buildings, walls, and natural vegetation has created a sense of place appropriate for public interpretation of the archaeological ruin. However, major freeways and streets, as well as numerous multistory commercial and office buildings border the park. The Crowne Plaza hotel on the northwest corner of Washington Street and 44th Street, just north of the proposed interconnection of the APM and the Light Rail Transit station, is

one of the tallest at approximately 10 stories. The urban development surrounding the park and the noise of traffic and airplanes make it obvious to visitors standing on the platform mound, which is the main publicly interpreted outdoor feature of the park that the park is in the middle of a large metropolitan area.

Views to the west, where the APM facilities would be built include light industrial and commercial properties, mostly with one-story buildings, and power lines, tall metal storage tanks, and billboards. From many places within the park, including the platform mound, museum buildings, walls, and trees partially screen views to the west. Nevertheless, the facilities would be visible from parts of the park. The impact of the changes to the visual setting of the park would be minimized through sensitive design of the Stage 2 - East APM facilities, considering factors such as massing, style, color, texture, glare, and potential for screening with vegetation. The FAA in consultation with the SHPO determined that a sensitive and compatible design will avoid adverse visual effect to the Pueblo Grande Museum and Archaeological Park. The proximity impacts would not be so severe that they would substantially impair the features and activities of the landmark and park that qualify it for protection under Section 4(f), and therefore would not constitute a Section 4(f) constructive use.

The elevated Stage 2 - East APM station at the Valley Metro Rail Light Rail Transit interconnection, an elevated section of the APM, and the APM maintenance and control facility would be visible from the hill on which the Tovrea Castle is located, but the facilities would be about 1 mile away and on the opposite side of the elevated Hohokam Expressway (SR 143). The APM facilities would not be visible from lower elevations within the Tovrea Castle parcel. Modern development has altered the setting of the Tovrea Castle considerably, and the minor change in the setting resulting from the ADP Alternative would not substantially impair the historic qualities that make the Tovrea Castle eligible for the National Register, and therefore would not be a Section 4(f) physical or constructive use.

The elevated section at the western end of the Stage 2 - West APM would be about one-half mile from the Sacred Heart Church. Within the context of the new multistory rental car center, the Stage 2 - West APM would be a minor alteration of the existing landscape. The setting is not an important characteristic of the Sacred Heart Church because it was drastically altered when the surrounding residential areas and street grid were removed after the property was incorporated into the airport. Therefore, the ADP Alternative would not be a Section 4(f) physical or constructive use of the historic church.

4.6.4 Potential Mitigation Measures

Because no physical use or constructive use of Section 4(f) resources was identified, no mitigation measures are proposed. If the ADP Alternative were selected, project planning would continue and final designs would be prepared in accordance with procedures defined in a new Section 106 Memorandum of Agreement between the FAA, City of Phoenix, Bureau of Reclamation, Salt River Project, and SHPO to address improvements at the airport (an unsigned copy of the MOA is contained in Appendix C of this FEIS). This also would include involvement of the Museum Director, Phoenix CHPO, and SHPO in the design of the State 2 - East APM facilities to ensure they are sensitive to and compatible with the adjacent park, and consider ways to have a beneficial impact by enhancing pedestrian access to the park. Construction techniques would be reviewed to reassess potential for construction-induced ground

vibration to damage the Pueblo Grande Ruin. If warranted, a program to monitor vibrations would be implemented to avoid damage to the ruin.

4.7 FARMLANDS

4.7.1 OVERVIEW OF IMPACTS

The No-Action Alternative would not impact farmlands protected by the FPPA because there would be no new construction or development activities relating to the proposed project. There is no farmland designated by the Natural Resource Conservation Service (NRCS) as prime or unique farmlands or otherwise protected by state or local agencies within the DSA. Therefore, none of the improvements associated with the ADP Alternative would affect protected farmlands.

4.7.2 METHODOLOGY

Under the implementing regulations for the FPPA, 7 CFR 658.2, areas that are already in urban development or committed to urban development are not protected farmlands. Property within the DSA was evaluated for existing and future land uses. The evaluation determined areas of urban and non-urban land uses and areas committed to urban development.
Property within the DSA was evaluated for existing and future land uses. The evaluation determined areas of urban and non-urban land uses and areas committed to urban development.

4.7.3 YEAR 2015 IMPACT POTENTIAL

4.7.3.1 No-Action Alternative

Development of the No-Action Alternative would occur on airport property and would not involve any ground disturbing activities. The land use associated with the No-Action Alternative is committed to urban development. Therefore, the No-Action Alternative would not result in farmland impacts.

4.7.3.2 ADP Alternative

Land use within the DSA is urban or committed to urban development. Therefore, the FPPA would not apply and no impacts to farmlands would occur as a result of the ADP Alternative.

4.8 FISH, WILDLIFE AND PLANTS

4.8.1 OVERVIEW OF IMPACTS

Under the No-Action Alternative there would be no construction or development activities relating to the proposed project. Therefore, there would be no impacts to biotic communities at the airport.

The potential impacts to biotic communities within the DSA resulting from the ADP Alternative were evaluated through field observations and by comparing aerial photographs of the DSA to detailed schematics of the alternatives. Within the DSA, no threatened or endangered species occur. Additionally, there are no native plant communities associated with the area of

disturbance and therefore no significant vegetative impact. No significant impacts to the biotic communities would result from the ADP Alternative.

4.8.2 METHODOLOGY

Early consultation was initiated with environmental review agencies due to the proximity of the ADP Alternative to the Salt River. Letters were obtained from the U.S. Fish and Wildlife Service (USFWS) and the Arizona Game and Fish Department to identify potential wildlife impacts which could be associated with the ADP Alternative. The USFWS letter, which is included in **Appendix A**, states that:

> "The Heritage Data Management System has been accessed and current records do not indicate the presence of any special status species as occurring in the project vicinity (2-mile buffer)."

Existing land coverage associations within the DSA were determined using aerial photographs and existing layouts of the ADP Alternative. In addition, potentially affected habitats within the DSA, including the terminal footprint and the Salt River, were visually confirmed through field reconnaissance by qualified biologists on July 16th and August 13th 2002 (see **Appendix D**). The Arizona Ecological Service Field Office (AESF) database, was researched for species information (http://arizonaes.fws.gov). Potential impacts associated with disturbance to the biotic communities as a result of each alternative were assessed by comparing layouts of the No-Action Alternative and ADP Alternative to aerial photographs and field reconnaissance.

4.8.3 YEAR 2015 IMPACT POTENTIAL

As described in **Section 3.10** of this EIS, PHX is located within a greatly disturbed and developed segment of the Salt-Gila Basin. The Salt River, a main biotic community in the area, is located south of the ADP Alternative.

4.8.3.1 No-Action Alternative

No impacts to the vegetative cover or wildlife habitat within the DSA would occur as a result of the No-Action Alternative. No new facilities would be constructed, and there would be no encroachment upon the vegetative cover or wildlife habitat.

4.8.3.2 Airport Development Program Alternative

Construction of the ADP Alternative would not significantly impact potential fish or wildlife habitat, or threatened or endangered species. The Salt River bed represents the only naturally occurring biotic associations within the DSA. The APM Stage 2 would cross the Grand Canal near Washington Street and SR 153, northwest of the airport property. At this location, the canal is concrete-lined and the adjacent area is primarily gravel with no vegetation associated with the canal. Waterfowl are infrequently observed in the canal. The proposed ADP Alternative should not impact the birds' ability to use the canal nor otherwise affect these or other species. Due to the distance from the area of disturbance and because there would be no proposed construction within and surrounding the riverbed, riparian and stormwater habitats, significant impacts would not occur. No federally or state-listed threatened or

endangered species are known or expected to occur in the DSA; therefore, the ADP Alternative would not impact such species.

4.8.4 POTENTIAL MITIGATION MEASURES

Due to a lack of potential impacts to wildlife habitats associated with the ADP Alternative, no mitigation measures are proposed.

4.9 FLOODPLAINS

4.9.1 OVERVIEW OF IMPACTS

Under the No-Action Alternative, there would be no development activities associated with the proposed project. Therefore, there would be no impacts to designated floodplains. For the ADP Alternative, potential floodplain encroachment is anticipated by the construction of the Stage 2 APM near the Grand Canal. The APM structure will be elevated above the floodplain, however, some piers and support infrastructure may be located in a 100-year floodplain. A review of potential impacts concludes that the encroachment would not be significant and no Federal finding is required. Mitigation measures may be implemented during the design and local approval process to minimize impact. No significant floodplain impact is expected.

4.9.2 METHODOLOGY

The potential impacts to the base flood elevations in areas affected by the ADP Alternative were evaluated by using the FEMA Flood Insurance Rate Maps for Maricopa County, specifically Map Numbers 04013C2135, 04013C2145, 04013C2155G, and 04013C2165 (all rev. 7/19/2001). Potential floodplain encroachments associated with the ADP Alternative were determined from a comparison of conceptual project drawings and the FEMA maps. Where potential encroachments were identified, local and Federal guidelines were employed to evaluate potential impact.

As discussed in Section 3.13.1, the MCFCD has regulatory authority through floodplain management in the DSA. According to local ordinances and policy, consistent with FEMA requirements, a significant encroachment upon the floodplain would be one that increases the base flood elevation by one foot within the designated region. This change would necessitate a floodplain map revision and a change in floodplain management in the study area.

FAA Order 1050.1E and 5050.4A state that if a project is not within the limits of a base floodplain, no further analysis is required. However, if the only practicable alternative results in a floodplain encroachment, further analysis is needed. The analysis would consider ways to minimize potential harm and determine if the encroachment is significant or not. A significant encroachment would involve: 1) high probability of loss of life; 2) substantial cost or damage, including interruption of aircraft service or loss of a vital transportation facility; and/or, 3) cause adverse impacts on natural and beneficial floodplain values. If the potential impact is considered significant, a finding would be required to confirm there is no practicable alternative to placing the project in a floodplain and that all measures to minimize harm would be included in the project.

4.9.3 YEAR 2015 IMPACT POTENTIAL

This section discusses the encroachment of constructed structures on the existing floodplains within the study area (see Figure 4.9.3-1).

4.9.3.1 No-Action Alternative

Under the No-Action Alternative, there would be no adverse effect on floodplains. No new facilities would be constructed, and there would be encroachment upon the existing floodplain.

4.9.3.2 Airport Development Program Alternative

Salt River Floodplain

The Salt River channel in the study area is confined with levees. The areas adjacent to the Salt River within the study area lie within FEMA FIRM Zone X designation, which include areas outside of 100-year floodplains; outside of 100-year floodplains with average depths of less than 1 foot or drainage areas less than 1-square mile; or areas protected by levees from the 100-year flood. The floodplain and floodway associated with the Salt River in this location is located within the levee system. Under the ADP Alternative, there would be no structures constructed within the Salt River floodplain or floodway and would not affect the river's levee system.

Grand Canal Floodplain

Stage 2 of the APM includes an elevated track that would cross the Grand Canal in the near the intersection of Washington Street and SR 153. The conceptual plan and profile show the APM crossing Grand Canal west of the SR 153 bridge and east of the Washington Street bridge (DMJM Aviation/ HDR 2004). This location, north of Grand Canal, is within a floodplain designated as Zone A. This corresponds to the 100-year floodplain, however, detailed hydraulic studies are not performed for such areas and no Base Flood Elevation are defined. Since the area north of the Grand Canal at the APM terminus is located in FEMA flood zone A, the 100-year elevation was estimated from the FEMA FIRM map and USGS Quadrangle maps. The estimated 100-year elevation at the APM terminus is 1,145 feet. Compliance with local flood regulations is mandatory for this site.

At the location of the proposed crossing, there would be approximately 12.1 feet of clearance between the north bank of the canal and the bottom of the APM aerial structure and LRT platform (see Figure 4.9.3-1). Piers would be constructed in the floodplain to support the elevated structures. The number and location of the piers and support infrastructure is unknown at this time. The development of the APM would also include the removal of an existing administrative/fee collection building that is located in the floodplain. This building is approximately 3,750 square feet in size.

In accordance with FAA Orders 1050.1E and 5050.4A, an analysis was conducted to consider alternatives, identify potential methods to minimize harm, and determine whether the potential impact is significant or not. The analysis is summarized in the following discussion.

Alternatives Considered - The development of the Stage 2 APM conceptual alignment included consideration of the need to provide efficient service to airport facilities; integration with other modes of transportation; airport-related approach and/or setback requirements; and existing physical and

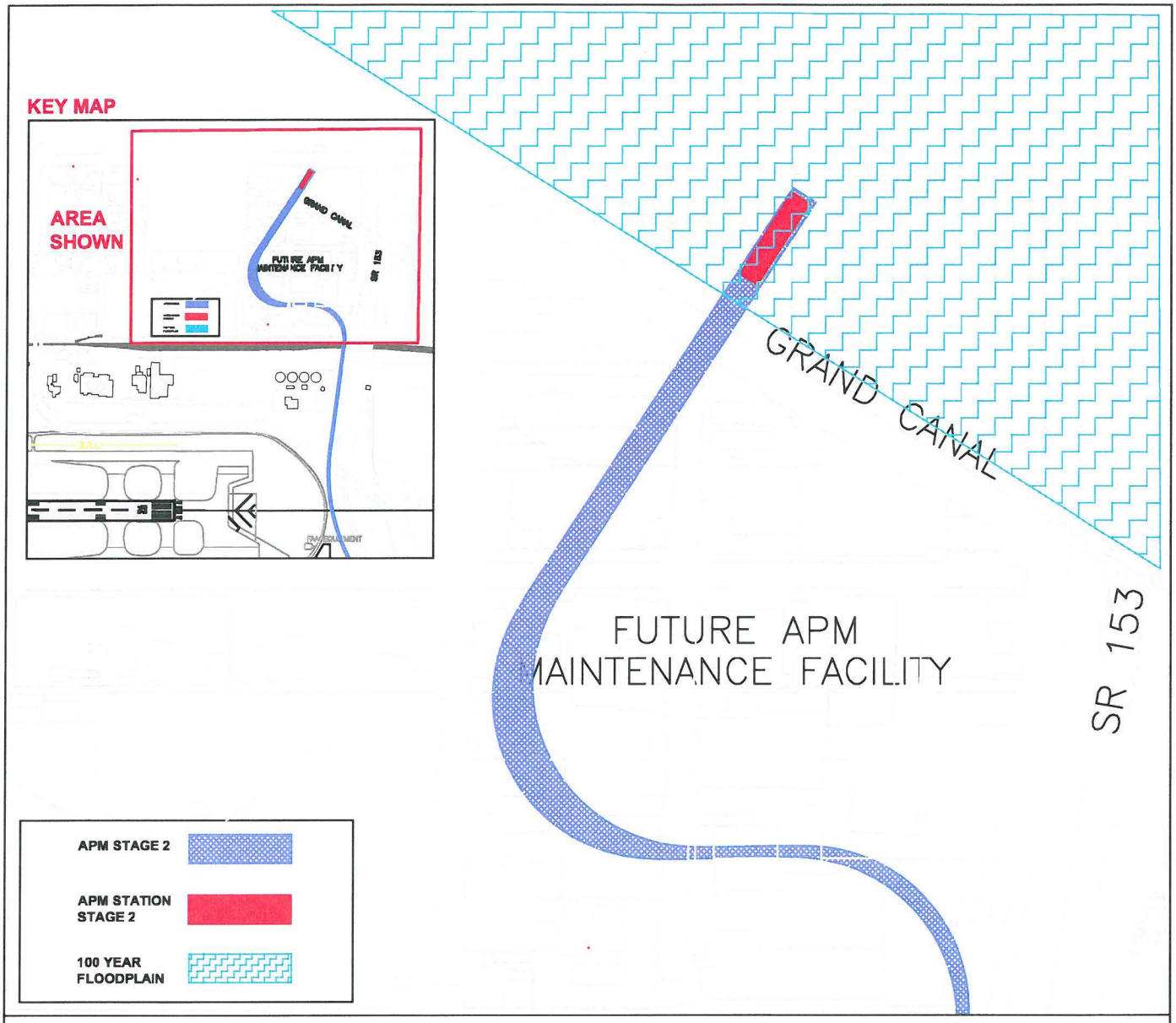
environmental constraints (i.e., dense urban development, the Salt River, and several major highways). Providing linkage with other transportation systems east of the airport would involve crossing either the Salt River or the Grand Canal. A review of FIRM maps show floodplains along the entire section of the Grand Canal in the study area. No practicable alternative outside a floodplain was identified.

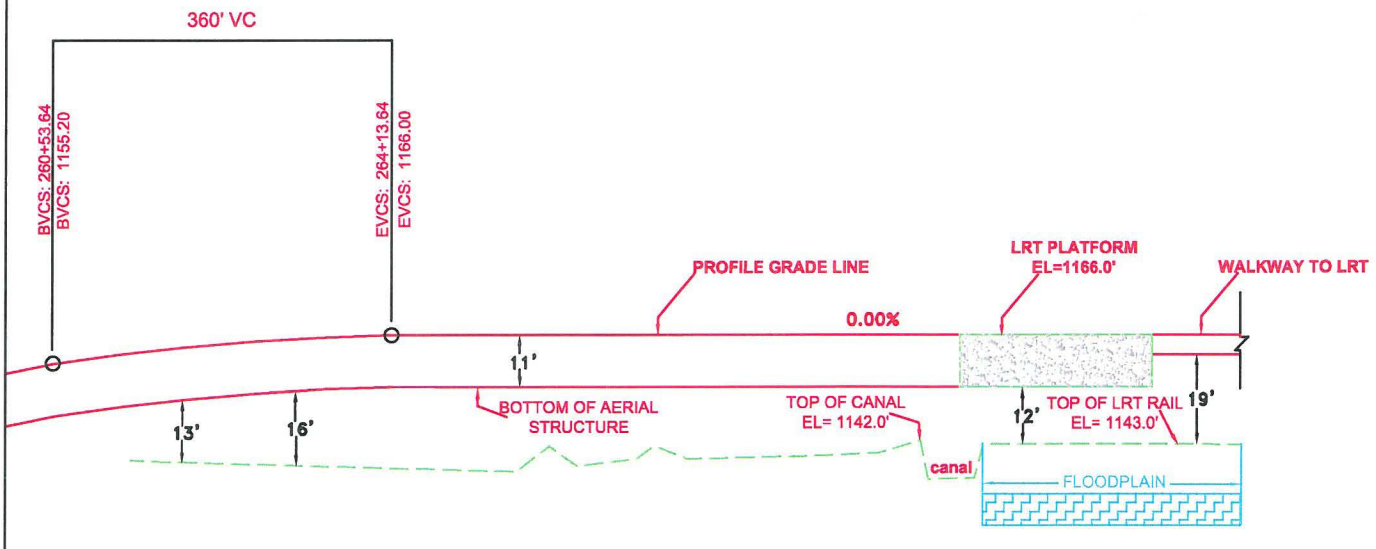
Potential Direct/Indirect Impacts - The proposed alignment of the Stage 2 - East APM has been identified in conceptual studies; however, engineering design for the ADP Alternative has not been conducted. The APM would be located on a bridge structure elevated on piers. For the Grand Canal crossing, the APM bridge structure would span the canal with no pier structures proposed in the canal. The bridge low member would be set approximately 12 feet above the canal top of bank elevation and 9 feet above the estimated 100-year flood elevation. This would eliminate any flow restrictions to the Grand Canal channel.

Based upon the APM alignment drawing (**Figure 4.9.3-1**), the APM would extend approximately 200 feet into the Zone A floodplain north of the Grand Canal. As an estimate of potential floodplain encroachment volume, it was assumed that there would be approximately three piers consisting of four 48-inch diameter piles located in the floodplain for the APM facility north of the Grand Canal. At the tie in to the LRT, there would be an additional twelve pilings 36 inches in diameter. These pilings would have a total area of 85 square feet. The footprint of the piles would be an equivalent area of only approximately 236 square feet. This encroachment area is not significant and would be offset by the removal of the 3,750-square-foot building from the floodplain.

The area proposed for the APM terminus within the Zone A floodplain area north of the Grand Canal is currently approximately 90 percent impervious area developed with parking lot and building facilities. The ADP Alternative only includes the elevated APM facility. No surface parking or building structures is included with this action. The APM facility would tie into the LRT facility that may include other facilities. Floodplain impacts associated with the LRT have been previously addressed in the *Central Phoenix/East Valley Light Rail Transit Project FEIS* dated November 1, 2002. As detailed in this FEIS, design data for the LRT is not currently available. The design of the LRT facilities will incorporate features minimizing potential impacts to the 100-year floodplains. The apron designs would incorporate similar or equivalent design features. During the permitting process in the final design stage, a hydraulic model would be developed to quantify potential impacts of the elevated APM and pilings on the 100-year surface elevation. Given the fact that the APM and LRT platform would be elevated, substantial direct impacts are not anticipated.

Based upon the projected change in runoff from impervious surfaces, the probable indirect impact of stormwater discharge from the airport due to the ADP Alternative is an insignificant change over baseline conditions. Adverse indirect impacts to beneficial floodplain values, cultural features, or wildlife habitat is not expected.





Source: West Terminal E.I.S. Project Description, June 2004, DMJM Aviation / HDR

Phoenix Sky Harbor International Airport	FLOODPLAIN IMPACTS OF THE ADP ALTERNATIVE	FIGURE 4.9.3–1

Methods to Minimize Harm - The APM and LRT platform would be elevated over the floodplain. The design of the piers and support infrastructure in the floodplain would consider methods to minimize adverse affects. This may include, but not be limited to, designing and placing piers and support infrastructure in a manner to minimize restrictions on the flow of flood waters and impacts to floodplain values. The removal of existing structures and facilities not necessary for the APM and LRT platform (e.g., existing 3,750 square feet administrative/fee collection building) from the floodplain would improve the existing condition and lessen the impact of the proposed piers and support infrastructure. Further, mandatory compliance with local floodplain ordinances would also impose measures to minimize and mitigate unavoidable impacts. This would require the APM and LRT platform to safely accommodate the design flood, withstand the attendant inundation, and perform satisfactorily under flood conditions.

Potential Significance of Impact - Based on the analysis of potential floodplain impacts, the encroachment is not considered to be significant and a Federal finding is not required. The following conditions were considered for this conclusion:

1. The proposed project would not have a high probability of loss of human life.
2. The proposed project would not have substantial encroachment-related costs or damage or cause interruption of aircraft service or loss of a vital transportation facility.
3. The proposed project would not have an adverse impact on natural and beneficial floodplain values.

4.9.4 POTENTIAL MITIGATION MEASURES

As indicated, the potential impact of the APM and LRT platform over the Grand Canal is not expected to be substantial and would not be considered a significant encroachment. Therefore, specific mitigation measures are not identified in this FEIS; however, based on the design of the project, mitigation measures may be required to satisfy local floodplain management ordinances. See Chapter 5.0 for potential mitigation measures associated with floodplain impacts.

4.10 HAZARDOUS MATERIALS AND SOLID WASTE

4.10.1 OVERVIEW OF IMPACTS

4.10.1.1 Hazardous Materials

Under the No-Action Alternative, modifications to Terminal 2 would be required to support remote gate and hardstand operations. The Terminal 2 modifications would require demolition and renovation activities in areas contaminated with asbestos containing materials (ACM). As part of the Terminal 2 No-Action Alternative, the City (or subcontractor) would prepare and implement an asbestos abatement program. This program would be developed in full compliance with applicable Federal, state and local regulations including Section 112 of the CAA and Arizona Administrative Code R18-2-1101.

The airport area planned for development of the ADP Alternative has been documented to contain environmental contamination resulting from activities associated with past land uses on or in the vicinity of the airport. The two known areas of environmental contamination in the vicinity of the proposed West Terminal are subsurface fuel plumes located in the vicinity of Terminal 2 and the former West Sky Harbor Fuel Facility. The nature of the contamination at these sites is well documented, and programs are in place or planned for the recovery and treatment of contaminated materials (e.g., fuel, soil, and groundwater).

Construction of the APM Stage 2 would require the City to purchase approximately 16.4 acres of privately held property in, and adjacent to, the APM right-of-way. As discussed in Section 3.7 of this FEIS, the Motorola 52nd Street/Honeywell 34th Street Facility National Priority List (NPL) site is located in the vicinity of the proposed APM Stage 2. A Corrective Action Plan for the Honeywell 34th Street facility was approved by the ADEQ on October 7, 2005. The potential for environmental contamination to airport property from the NPL site has not been determined. Due diligence audits and site surveys would be performed to verify the status of the property prior to acquisition.

During construction of the West Terminal and associated projects, or Terminal 2 renovations under the No-Action Alternative the contractors would use various forms of materials on a temporary basis that are classifiable as hazardous or are otherwise regulated. Consisting primarily of fuels and other petroleum-based products, these materials would be stored, transported, and disposed of in accordance with applicable regulations and BMPs. The City of Phoenix has committed they will perform all ADP development activities in full compliance with all applicable Federal, state and local regulations.

It is not expected that implementation of the ADP Alternative would substantially alter the types of hazardous materials and other regulated materials currently used at the airport. However, the amounts may increase in the future, under both the ADP Alternative or the No-Action Alternative, due to the forecasted increase in the number of aircraft operations and associated activity at PHX. Any construction activities that involve disturbance of the surface have the potential to expose and release previously unknown hazardous materials and wastes that may be located in the vicinity. In the event of a spill or unanticipated release of regulated materials including fuels, contractors will be required to cease work in the immediate area and report the release to the National Response Center (NRC).

4.10.1.2 Solid Waste

The No-Action Alternative and the ADP Alternative were evaluated for their potential municipal solid waste impacts. Such impacts would result from the temporary generation of solid waste due to demolition and construction activities and from future operations at PHX. Also, PHX was evaluated for the ability to comply with guidelines contained in FAA's AC 150/5200-33A, *Hazardous Wildlife Attractants On or Near Airports*.

The ADP Alternative would result in a temporary increase in construction and demolition waste at PHX. This would not significantly impact the ability of area landfills to accommodate this increase in capacity demand. The ADP Alternative has the potential to increase solid waste generation resulting from an increased availability of concessions and other passenger amenities in the new West Terminal. Neither the No-Action Alternative nor the ADP Alternative would result in a significant impact to regional landfill capacity nor activities leading to an increased bird strike potential at PHX.

4.10.2 METHODOLOGY

4.10.2.1 Hazardous Materials

Information presented previously in **Section 3.7** summarized what is known about facilities and sites that currently (or historically) contain hazardous materials (including hazardous wastes, hazardous substances and dangerous goods), other regulated substances (fuel, oil and similar types of petroleum products) or environmental contamination on, and in the vicinity of, PHX. For the purposes of this analysis, this assessment focused on the ADP Alternative Area of Disturbance (AOD) shown previously on **Figure 3-2**.

Information was acquired or developed using a variety of investigative methods and sources including: a) visual in-the-field inspection of baseline conditions; b) review of available environmental site assessments, contamination reports, and remediation plans; c) an electronic database survey of regulatory agency records; and d) information from City of Phoenix Aviation Department staff. This assessment was not meant to serve as an Environmental Site Assessment or hazardous material survey of the project site or study area nor were the sampling and testing of environmental media conducted.

Various forms of aircraft and motor vehicle fuel (i.e., jet, avgas, gasoline, and diesel) are, by a large measure, the most common materials at PHX that are classifiable as hazardous or otherwise regulated. With a few exceptions, these substances are contained in above ground storage tanks (ASTs) and underground storage tanks (USTs) or fuel hydrant piping systems. Within the AOD, many of these facilities have been removed, are closed and no longer used. However, over the years, some of these facilities experienced accidental discharges to the soil and groundwater that have resulted in environmental contamination.

Because building of the ADP Alternative would involve a variety of construction methods that would require subsurface excavation, the potential impacts to these contaminated areas are assessed in this section. The temporary use of hazardous materials and other regulated substances during the construction process and the long-term involvement associated with the operation of the new facilities are also briefly discussed. Finally, mitigation measures designed to minimize the potential environmental impacts are presented.

4.10.2.2 Solid Waste

The No-Action and ADP Alternatives were evaluated for the potential to result in impacts associated with the generation and/or disposal of municipal solid waste (MSW). Specifically, the evaluation included MSW impacts from:

- Demolition and construction activities;
- Future operations at PHX; and
- Compliance with the guidelines contained in the FAA's AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*.

The potential for temporary generation of solid wastes due to demolition and construction activities was based on the type of construction activities associated with the individual projects that constitute the ADP Alternative.

According to FAA AC 150/5200-33, waste disposal sites having the potential to attract birds are considered incompatible if located within 10,000 feet (1.9 statute miles) of any runway used or planned to be used by turbine-powered aircraft or located within a 5-mile radius of a runway that attracts or sustains hazardous bird movements into or across the runways and/or approach and departure patterns of aircraft.

4.10.3 YEAR 2015 IMPACT POTENTIAL

4.10.3.1 No-Action Alternative

Hazardous Materials

Since the No-Action Alternative would not involve construction or operation of any new buildings, roadways or other airport facilities, there are no anticipated impacts associated with hazardous or other regulated materials or environmental contamination. Implementation of the No-Action Alternative would require that modifications to Terminal 2 be accomplished to provide for remote gate busing operations. Physical modifications to Terminal 2 would be complicated by the presence of large amounts of ACM. Removal and proper disposal of these materials would be required. Asbestos abatement activities would be performed in compliance with Section 112 of the Clean Air Act and all other applicable Federal regulations. Further, the City has stated they will perform asbestos abatement activities in compliance with Arizona Administrative Code R-18-2-111 and all other applicable state and local regulations.

The No-Action Alternative would not impact any ongoing or planned remediation activities associated with either the Terminal 2 Jet Fuel Plume, the Motorola 52nd Street NPL Site, or the West Sky Harbor contaminant plumes. Any construction activities that involve disturbance of the surface have the potential to expose and release previously unknown hazardous materials and wastes that may be located in the vicinity. In the event of a spill or unanticipated release of regulated materials including fuels, contractors will be required to cease work in the immediate area and report the release to the National Response Center (NRC).

There would also be an increased use of fuel, lubricating oils, cleaners, and other similar substances attributable to the forecasted increase in aircraft operations at PHX. Because of the need to transport fuel to aircraft parked at remote parking positions under the No-Action Alternative, there would be a greater

potential for accidental fuel spills during the transport or fueling operation than would exist with full contact gates supported by a hydrant fueling system.

Solid Waste

The No-Action Alternative assumes that the ADP Alternative would not be constructed and there would be no generation of ADP construction debris. The modification of Terminal 2 would include the generation of small quantities of demolition and construction debris, and the removal of small quantities of ACM. Terminal 2 construction/renovation debris would be disposed of at the landfill currently utilized by PHX for other non-connected airport construction activities. ACM would be disposed of in accordance with all appropriate Federal, state, and local regulations. In 2004, Terminal 2 was staffed with approximately 2,400 full-time and part-time employees. Based on historical employment growth rates (estimated to be 2.51 percent per year) employment in Terminal 2 would total approximately 3,150 employees in 2015. The additional solid waste generated by this change in employment is not significant when considered within the context of solid waste generated for the entire airport.

Construction debris generated by the demolition of Terminal 2 and ADP activities would be disposed of at the new SR 85 landfill. Communication with the City of Phoenix Solid Waste Department (see **Appendix A**) indicates that sufficient landfill capacity is available in the Phoenix/Maricopa County area to accommodate this construction debris.

There are no landfills within 10,000 feet of any runway or within a 5-mile radius of PHX. The No-Action Alternative is consistent with the recommended guidance provided in FAA AC 150/5200-33.

4.10.3.2 Airport Development Program Alternative

Hazardous Materials

As shown previously on **Figure 3.7.2-1**, the ADP Alternative is located in areas of the airport that are reported to contain sites of environmental contamination and facilities that used hazardous materials or other regulated substances. These include portions of the West Terminal Complex (terminal building, passenger concourses, parking garage and aircraft aprons), the Stage 2 - East APM, crossfield taxiways, and the modification/relocation of Sky Harbor Boulevard. The two principal areas of environmental contamination are Terminal 2 and the former West Sky Harbor Fuel Facility plumes. These sites are shown on **Figure 4.10-1** and discussed below.

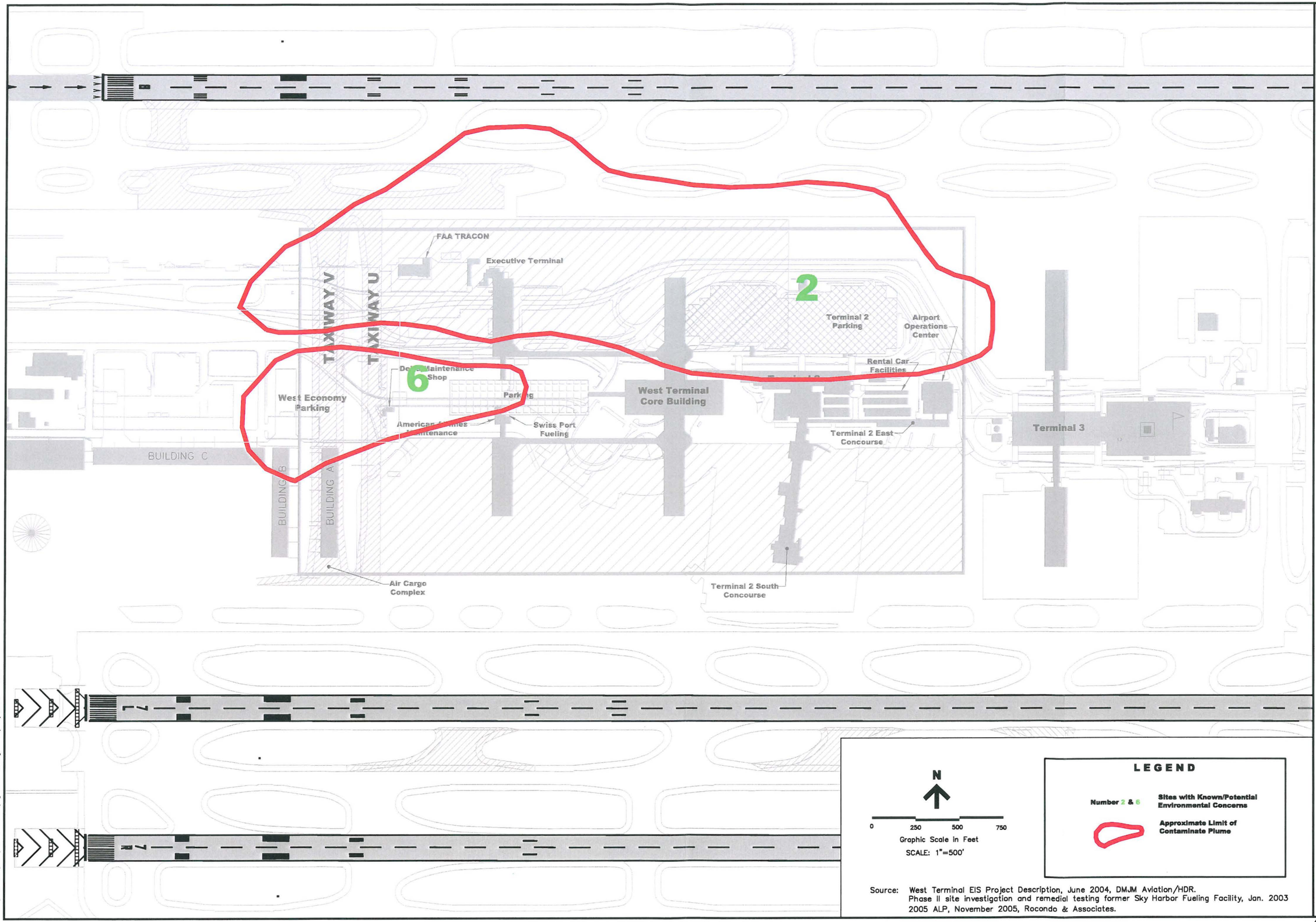
Terminal 2 Fuel Plume (Site 2) - As shown on **Figure 4.10-1**, the individual elements of the ADP Alternative located in the area of the Terminal 2 Plume include sections the West Terminal Complex northern concourses, the aircraft apron, the crossfield taxiways and portions of Sky Harbor Boulevard. The Arizona Fueling Facility Corporation (AFFC) reports that it is currently remediating the Terminal 2 plume in accordance with all applicable regulations. In order to accelerate the remediation process, supplemental clean-up measures were installed and activated in 2004 (AFFC, 2002). Also, according to the AFFC, there is a small possibility of exposures to petroleum products to construction workers in this area, but the site does not represent an impediment to the completion of the ADP Alternative nor constitute a threat to the public health and welfare. All work on the ADP Alternative would be performed in accordance with OSHA requirements and documented in a project-specific Health and Safety Plan.

West Sky Harbor Fuel Facility Fuel Plume (Site 6) - As shown on Figure 4.10-1, the ADP Alternative is located within the area bounded by the West Sky Harbor fuel plume site. ADP projects within the fuel plume site include the West Terminal Complex, parking garage and northwest concourse; the Stage 2 - East APM; crossfield taxiways, and modification/realignment of Sky Harbor Boulevard. The contamination plume is under a remediation program involving an extensive network of soil gas and groundwater recovery wells. Pilot studies have been performed to evaluate a variety of remedial technologies applicable at this site. As a result of these studies, the City of Phoenix has selected soil vapor extraction (SVE) and biosparging as the remedy at the West Sky Harbor Site. Pilot studies of this technology are ongoing. Upon satisfactory completion of these studies, the SVE/biosparging technology would be implemented. The design and construction of the ADP Alternative would include appropriate measures to further remediate this site and to prevent the migration of contaminants to other areas of the airport. Project specific hazardous materials management plans will be developed as part of the project design. These plans will be submitted to the appropriate regulatory agencies for approval.

Motorola 52nd Street National Priority List Site / Honeywell 34th Street Facility - The Motorola 52nd Street NPL site, which is part of the Honeywell 34th Street Facility is located immediately north of PHX. Contamination from this site consists of free project jet fuel which has been mixed with chlorinated solvents. Chlorinated solvents detected within the jet fuel plume include trichloroethene (TCE), vinyl choride, 1,1-dichloroethane (1,1-DCA) and Freon (ADEQ, 2005). The contaminant plume from the site extends to within approximately 400 feet northeast of Terminal 3 and extends from the Honeywell Facility south beyond Runway 8-26 and taxiways B and C (see Figure-3.7.2-1). A Corrective Action Plan for the Honeywell 34th Street facility was approved by the ADEQ on October 7, 2005. A copy of the ADEQ approval letter is provided in Appendix A. Further characterization of the contaminant plume is ongoing. Honeywell intends on initiating cleanup activities to remove the fuel within two years.

Data published by the ADEQ in the *Motorola 52nd Street Superfund Site Update Report,* dated February 2005, indicates that the contaminant plume has not migrated into the area proposed for APM development. However, in ADEQ correspondence to the FAA following release of the ADP DEIS, ADEQ identified parcels that are potentially to become part of the APM station at 44th and Washington Streets and of the APM Maintenance Facility. ADEQ believes that these parcels and the underlying groundwater are potentially contaminated with chlorinated solvents. The facilities proposed for this area will be largely at or near grade and will not require extensive excavation. Groundwater contamination conditions are not likely to have a significant impact on the project. However, the City will conduct appropriate due diligence for acquisition of the parcel and as a part of the design of the proposed facilities. The City of Phoenix does not believe that either the jet fuel free product or the dissolved phase CVOC plumes from the Honeywell site would impact the proposed project.

Other Sites Located in the AOD - The remaining sites identified in Section 3.7 reported as containing hazardous materials, regulated substances and/or environmental contamination were determined not to represent potentially significant impacts to the construction and operation of the ADP Alternative. This includes the areas along the Stage 2 - East APM and Sky Harbor Boulevard corridors located to the west of the planned West Terminal Complex and Crossfield taxiways.



Source: West Terminal EIS Project Description, June 2004, DMJM Aviation/HDR.
Phase II site investigation and remedial testing former Sky Harbor Fueling Facility, Jan. 2003
2005 ALP, November 2005, Rocondo & Associates.

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Extent of Fuel Plumes Contamination Sites 2 and 6

FIGURE 4.10-1

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The City of Phoenix is actively reviewing data from the Motorola 52nd Street/Honeywell 34th Street Site as it becomes available. The City does not believe that either the jet fuel free product or the dissolved phase of the VOC plume from Honeywell site would impact development of the ADP Alternative.

Approximately 16.4 acres of land within the Stage 2 - East APM corridor are in private ownership, and would be purchased by the City. Due diligence audits and surveys would be performed as part of the acquisition process to verify there is no onsite contamination. If contamination is found, the sites would be remediated in accordance with state and local environmental requirements and BMPs.

During construction of the APM Stage 2, it is possible that tunnels would be constructed at depths at or below groundwater elevation in some locations. The tunnels in those locations would be constructed using a tunnel boring machine (TBM) that would require continuous grouting in a closed-face mode. Minimal or no dewatering would be required. Therefore, the construction would have minimal impact on groundwater migration patterns or altering the contaminant concentrations of potentially contaminated groundwater in the area of the ADP Alternative.

The contractor would be required to obtain the necessary permits regarding dewatering, discharge and, if necessary, treatment of water, as required, from the Arizona Department of Environmental Quality (ADEQ) and the Arizona Department of Water Resources prior to construction. (Several of these permits would require the contractor to be a co-permittee with the City of Phoenix.) Under the provisions of the permits, if no contamination of groundwater is encountered during dewatering, the water could be discharged to a stormwater drain. If contaminated groundwater were encountered, an action plan would be established, with the approval of ADEQ, and the contaminated groundwater would have to be treated onsite or transported offsite for treatment to surface water quality standards prior to release.

Any construction activities that involve disturbance of the surface have the potential to expose and release previously unknown hazardous materials and wastes that may be located in the vicinity. In the event of a spill or unanticipated release of regulated materials including fuels, contractors will be required to cease work in the immediate area and report the release to the National Response Center (NRC).

Operational Impacts - It is not expected that the operation of the ADP Alternative would substantially alter the types of hazardous and other regulated materials used at the airport. However, the use of fuel and other regulated substances necessary for routine operations at the airport would continue and may increase to correspond to the forecasted growth in operations at the airport and would occur with either alternative. The storage, use, and disposal of these materials are subject to an extensive array of Federal and state requirements designed to help prevent their unauthorized or accidental release into the environment.

Hazardous materials (also termed "dangerous goods" by the airline and air cargo industry) may be transported by air when they comply with certain restrictions. These restrictions include packaging, labeling, and reporting requirements, which are mandated by the Federal Hazardous Materials Transportation Act. This statute and its implementing regulations also place restrictions on the type of hazardous materials that may be carried on aircraft. All airlines and air cargo carriers have established guidelines for handling and transporting hazardous materials that are intended to comply with these Federal regulations, protect employee health and safety, and minimize any potential risks to the public and the environment. These measures will remain in-place and unchanged with the implementation of the ADP Alternative.

Solid Waste

Construction and demolition debris associated with the ADP Alternative would likely consist of typical building materials including vegetative debris, wood waste, excess wiring, conduits and other electrical materials, empty construction supply containers, asphalt, metal, and concrete.

Demolition debris for the ADP Alternative could potentially equate to 596,400 tons of asphalt, concrete, and steel (*West Terminal Development Program, Task 2 Conceptual Study,* Turner, 2002). This would include, but not be limited to, approximately 264,000 tons of debris of Terminal 2 parking and roadway, 30,000 tons for the West Terminal Roadway, 27,000 tons for the Terminal 2 apron, and 22,000 tons for Sky Harbor Boulevard. Remaining construction waste would be removed by private contractors and transported to a local transfer station for additional sorting and potentially to the Southwest Regional, Queen Creek, Northwest Regional, or Butterfield Station landfills for disposal.

Implementation of the ADP Alternative would require the demolition of Terminal 2. This demolition would require the removal and disposal of asbestos-containing materials (ACMs). Due to the age of Terminal 2, asbestos could be found in insulation, flooring tiles, and other construction materials. Prior to demolition, asbestos abatement activities would be performed in compliance with Section 112 of the CAA, Arizona Administrative Code R18-2-1101, and all other applicable Federal and state regulations. The City of Phoenix has committed in writing that they will perform all ADP development activities in full compliance with all applicable Federal, state, and local regulations. Communications with the City of Phoenix Solid Waste Department indicate that the Phoenix/Maricopa County area has sufficient landfill capacity to accommodate solid waste generated as a result of the ADP Alternative.

Based on future aircraft operations at PHX being equal to the No-Action Alternative, the volume of solid waste generated due to passenger enplanements would be similar to both the No-Action and ADP Alternatives. The ADP Alternative would employ approximately 800 persons in 2015, which would generate additional solid waste as compared to the No-Action Alternative. However, because the planned employment for the ADP Alternative represents less than 15 percent of the total onsite part-time and full-time workforce, this increase would not be significant. This amount of MSW would be capable of being accommodated at the new SR 85 Landfill, to open in 2005. The landfill is projected to have a MSW capacity of 50 years.

There are no landfills within 10,000 feet of any runway or within a 5-mile radius of PHX. The ADP Alternative is consistent with the recommended guidance provided in FAA AC 150/5200-33.

4.10.4 Potential Mitigation Measures

4.10.4.1 Hazardous Materials

Construction of the ADP Alternative would be conducted in areas of the airport that are known to contain environmental contamination. The contamination, consisting of aviation fuel, is present in the areas proposed for construction of the West Terminal, Stage 2 - East APM, and Sky Harbor Boulevard redevelopment. However, it is not anticipated that the existing plumes would substantially interfere with the construction process. Furthermore, it is not expected that development of the ADP Alternative would

exacerbate the existing contaminant conditions, nor would the project impede the clean-up process (Hughto, 2004). Any construction activities that involve disturbance of the surface have the potential to expose and release previously unknown hazardous materials and wastes that may be located in the vicinity. In the event of a spill or unanticipated release of regulated materials including fuels, contractors will be required to cease work in the immediate area and report the release to the National Response Center (NRC). Further information associated with mitigating hazardous materials can be found in Chapter 5.0.

4.10.4.2 Solid Waste

The generation of demolition and construction debris would be closely phased with construction activities and, therefore, would not occur all at once. This would allow the waste product to be disposed of in an orderly, planned fashion that would reduce the overall impact to the SR 85 Landfill. Recycled materials (concrete and asphalt) could be reused on airport projects associated with the ADP Alternative. See Chapter 5.0 for further information associated with mitigating solid waste impacts.

4.11 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

4.11.1 OVERVIEW OF IMPACTS

There would be no impacts on historic, architectural, archaeological, or cultural resources associated with the No-Action Alternative. The ADP Alternative would result in construction activities that may affect historic properties eligible for the National Register of Historic Places and the proposed facilities could modify their visual settings.

Construction impacts of the ADP Alternative on three historic properties, including: 1) *The Phoenix*, a mural by Paul Coze installed in the Terminal 2 lobby, 2) the Grand Canal, and 3) the Phoenix Main Line of the Southern Pacific Railroad, are not considered adverse. The ADP Alternative could disturb parts of three large prehistoric Hohokam archaeological sites (Pueblo Salado, Dutch Canal Ruin, and Pueblo Grande), which may have associated human remains and funerary objects that are of concern to affiliated tribes. In addition, two other archaeological sites [AZ U:9:2 and 26(ASM)], where buried remnants of 19 Hohokam canals and the 1884 Joint Head Canal have been recorded, as well as other canals of the Hohokam irrigation canal Systems 2 and 10, also could be disturbed by construction activities. Modern development has masked those archaeological sites and the locations, condition, and extent of potential impacts are ambiguous, but disturbance of intact deposits that have potential to yield information would be an adverse effect. The project also has potential to adversely affect the visual setting of the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park.

The ADP Alternative would result in the FAA continuing to inventory, evaluate, and assess effects in accordance with a Section 106 Memorandum of Agreement to be executed (see Appendix C for an unsigned copy of the MOA). There is potential to satisfactorily mitigate adverse effects on archaeological sites by conducting studies to recover and preserve important information before

they are disturbed. If associated human remains were found, they would be treated and repatriated in accordance with a 1995 burial agreement that the City of Phoenix has executed to comply with the Arizona Antiquities Act. The FAA and Phoenix Aviation Department would avoid potential visual effects on the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park through sensitive design of the Stage 2 - East APM facilities. The Museum Director, Phoenix CHPO, and SHPO would be involved in defining design criteria and reviewing developing designs of the Stage 2 - East APM station and maintenance facility. The FAA concluded, in consultation with the SHPO, that a sensitive design of the proposed facilities consider factors such as massing, style, color, texture, glare and potential for screening with vegetation, would have no adverse effect on the Pueblo Grande Museum and Archaeological Park. Future consultation between the FAA, Director of the Pueblo Grande Museum and Archaeological Park, City of Phoenix Archaeologist, City of Phoenix Historic Preservation Officer, and SHPO will occur throughout the design process to ensure that a sensitive design and compatible design will avoid adverse effect to the Pueblo Grande Museum and Archaeological Park. The project has potential to result in a beneficial effect by enhancing public awareness of the Pueblo Grande Museum and Archaeological Park and enhancing pedestrian access from the APM and Valley Metro Rail stations.

4.11.2 METHODOLOGY

Assessment of the potential effects on historic, architectural, archaeological, and cultural resources was based on criteria defined by regulations for Protection of Historic Properties (Title 36, CFR, Part 800). These regulations define an effect as a direct or indirect alteration to 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 (Title 36, CFR, Part 800.5 (a)(2)):

- 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 (Title 36, CFR, Part 68) and applicable guidelines;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features in the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property, which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

- 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.

The FAA applied criteria of adverse effect to each historic property listed in or eligible for the National Register within the area of potential effects. The results of this evaluation were documented in a technical report: *Historical, Archaeological, and Traditional Cultural Places Technical Report*, dated March 2005. This report was submitted to SHPO in March 2005. Based on the results of this report, SHPO recommended that a Memorandum of Agreement (MOA) be developed for the proposed ADP Alternative project (see SHPO correspondence dated April 20, 2005 in **Appendix A**). The FAA concurred with this recommendation. Because of the potential for avoidance, reduction, or mitigation of adverse effects through the Section 106 consultation process, a determination of adverse effect does not automatically equate with a significant impact for the NEPA analysis. FAA considers these factors, in consultation with the SHPO, in deciding whether impacts to historic properties exceed the threshold for a significant impact as defined by NEPA (FAA Order 1050.1E, Environmental Impacts: Policies and Procedures, Appendix A, Section 11.3).

4.11.3 YEAR 2015 IMPACT POTENTIAL

4.11.3.1 No Action Alternative

The No-Action Alternative would result in the proposed ADP projects not being built and there would be no ground disturbance, demolition, or alteration of the visual landscape as a result of a Federal undertaking. Such a decision would result in no effect on historic properties listed in or eligible for listing in the National Register.

4.11.3.2 Airport Development Program Alternative

Construction Impacts

Potential sources of construction impacts include (1) right-of-way acquisition, (2) physical disturbance due to demolition and construction activities, (3) noise and vibration effects of construction. The inventory of historical, architectural, archaeological, and cultural resources identified nine National Register-eligible properties within the area of potential effects for construction impacts, which was defined as the AOD (**Table 4.11.3-1**). Definition of the AOD was coordinated with the SHPO early in the EIS process (see correspondence in **Appendix A**).

Because modern development has masked archaeological resources that may be present, the extent of and condition of those resources, as well as potential effects on them are ambiguous. Ground disturbance associated with construction of the ADP Alternative has potential to disturb parts of three archaeological sites that are remnants of large Hohokam habitation sites. Substantial archaeological excavations have been conducted at all three of these sites. Construction of the Sky Harbor Boulevard modifications could disturb the southern edge of the Dutch Canal Ruin [AZ T:12:62(ASM)]. Construction of the Stage 2 - West APM could disturb part of the northern edge of the Pueblo Salado archaeological site [AZ T:12:47(ASM)] that has not been previously studied. Construction of the northern end of the Stage 2 - East APM corridor could disturb the western margin of the Pueblo Grande archaeological site [AZ U:9:1(ASM)].

Construction of the Stage 2 - East APM could disturb 19 Hohokam canals and the historical Joint Head Canal recorded in sites AZ U:9:2 and 26(ASM). Construction on the airport could disturb other canals mapped decades ago as part of the Hohokam irrigation canal Systems 2 and 10, which extend into the AOD on the airport, but their conditions are unknown. Other archaeological evidence of historic-era agricultural and urban development could be found on and off the airport, but the potential for significant historic-era archaeological resources is low (refer to Appendix C).

TABLE 4.11.3-1
POTENTIAL CONSTRUCTION IMPACTS

Site Name/Number		Location	Description	National Register Status[1]	Potential Effect
1	Pueblo Salado AZ T:12:47(ASM)	Southwest part of the Airport	Prehistoric Hohokam habitation site	Eligible, Criterion D	APM Stage 2-West might disturb unstudied part of site: adverse effect
2	Dutch Canal Ruin AZ T:12:62(ASM)	Northwest part of the Airport	Prehistoric Hohokam (mostly seasonal) habitation site	Eligible, Criterion D	Sky Harbor Boulevard realignment might disturb margin of site: adverse effect
3	Pueblo Grande AZ U:9:1(ASM)	Adjacent to Stage 2 - East APM corridor	Prehistoric Hohokam primary village with ballcourts and platform mound	Part outside city park eligible, Criterion D	Stage 2 - East APM might disturb western edge of site: adverse effect
4	AZ U:9:2(ASM)	Adjacent to Stage 2 - East APM corridor	11 prehistoric Hohokam canals, 1884 Joint Head Canal	Eligible, Criterion D	Stage 2 - East APM might disturb buried canal remnants that extend west of site: adverse effect
5	AZ U:9:28(ASM)	Adjacent to Stage 2 - East APM corridor	8 prehistoric Hohokam canals, 2 activity areas, 3 historical trash pits	Eligible, Criterion D	Stage 2 - East APM might disturb buried canal remnants that extend west of site: adverse effect
6	Hohokam Canal Systems 2 and 10	Airport and vicinity	Prehistoric Hohokam irrigation canals, recorded decades ago and condition unknown	Any intact segments likely to be eligible, Criterion D	Construction might disturb buried canal remnants: adverse effect
7	*The Phoenix,* a mural by Paul Coze	2908 E. Sky Harbor Blvd., in Terminal 2	Historic art object created in 1962	Eligible, Criterion C	To be relocated: no adverse effect
8	Phoenix Main Line of Southern Pacific Railroad (now Union Pacific) AZ T:10:84(ASM)	South of Jackson St., Stage 2 - East APM corridor	Historic railroad built in 1924-1926	Eligible, Criterion A	Stage 2 - East APM would cross beneath railroad under existing bridge: no adverse effect
9	Grand Canal AZ T:7:167(ASM)	South of Washington St., Stage 2 - East APM corridor	Historic canal constructed in 1878	Eligible, Criterion A	Stage 2 - East APM would cross over canal on elevated structure: no adverse effect

[1] Determinations of eligibility and effects made by FAA in consultation with the SHPO; refer to Section 3.9.1 for definition of eligibility criteria. The FAA concurs with the SHPO conclusions regarding potential impacts as detailed in the SHPO correspondence dated April 20, 2005 (see Appendix A).

Source: City of Phoenix Aviation Department, SHPO files, Maricopa County Assessor Records.

Any intact archaeological resources within the AOD are likely to have potential to yield important information and therefore be eligible for the National Register under Criterion D. Some of the sites also might have associated human remains and funerary objects. Treatment of human remains and such objects is of concern to affiliated tribes and the FAA. Construction disturbance of archeological sites eligible for the National Register and any associated human remains would be an adverse effect.

None of the buildings that would be demolished by implementation of the ADP Alternative are listed in or eligible for the National Register. However, *The Phoenix*, a mural by Paul Coze installed within the Terminal 2 lobby, is considered eligible for the National Register under Criterion C. The ADP Alternative would demolish Terminal 2 and replace it with a new West Terminal. The Phoenix Aviation Department would remove and preserve the mural prior to demolition of the terminal. In contrast to a historical building or structure, the mural is an inherently moveable object of art, and its historical artistic values are not tied to its location. The FAA, in consultation with the SHPO, has concluded that moving the mural and remounting it in another public location at the airport would not adversely affect the historic values that make the mural eligible for the National Register.

Before the Paul Coze mural is removed from Terminal 2, the mural would be photo-documented. The airport art curator would ensure that the mural is carefully removed to avoid damage to the multimedia mural. The Phoenix Aviation Department would remount the three panels of the mural together in an appropriate public location on the airport in a timely manner. The history of the mural would be documented and publicly interpreted when it is remounted. The FAA would consult the SHPO and Phoenix CHPO as detailed plans for removing and remounting the mural are developed and implemented.

Two other historic structures are within the AOD along the Stage 2 - East APM corridor off the Airport: 1) the Grand Canal (AZ T:7:167(ASM)], and 2) the Phoenix main line of the Southern Pacific Railroad (AZ T:10:84(ASM)]. Both are considered eligible for the National Register under Criterion A. The Stage 2 - East APM would cross beneath the Phoenix main line of the Southern Pacific Railroad using the existing bridge that carries the railroad over the depressed Sky Harbor Expressway (SR 153). The Stage 2 - East APM would cross over the Grand Canal on a proposed elevated guideway structure. An APM maintenance and control facility would be constructed between the railroad and canal. The railroad and canal would not be altered, and the ADP Alternative is not expected to adversely affect the historic qualities of the canal and railroad that make them eligible for the National Register.

Construction activities would result in short-term increases in noise levels, but those would comply with City of Phoenix regulations, and be restricted to the immediate vicinity of the construction zones. In an urban setting, such noise is not projected to have any potential permanent adverse effects on the identified historic properties.

The potential for construction-induced ground vibration to damage the archaeological ruins within the Pueblo Grande Museum and Archaeological Park also was evaluated. A previous study recommended restricting use of heavy equipment within 150 feet of the platform mound and surrounding residential compound. The Stage 2 - East APM would be no closer than approximately 1,000 feet, and therefore construction-induced ground vibration is not expected to adversely affect the ruin. The FAA will review

construction plans for the Stage 2 – East APM and APM maintenance and control facility to determine whether any blasting, pile driving, or other techniques that might create high levels of ground vibration have the potential to damage the archaeological ruins of the parks. If warranted, a vibration-abatement monitoring plan would be implemented to avoid damage to the ruins. Vibration resulting from operation of the APM would be attenuated because the APM will be constructed on pilings or piers. Because the APM tracks would be approximately 1,000 feet from the ruins and on the opposite side of Sky Harbor Expressway (SR 153), there would be no adverse affect on the ruins due to vibration resulting from operation of the APM.

Potential Visual Impacts

Potential visual impacts could stem from construction of the elevated elements of the ADP Alternative, including the new West Terminal, elevated structures associated with modification of Sky Harbor Boulevard, elevated sections of the Stage 2 APM, and the APM maintenance and control facility. Potential visual impacts on five historic properties were assessed (Table 4.11.3-2).

The one historic building on the airport is the Sacred Heart Church, which is approximately one-half mile from the Stage 2 - West APM alignment - the closest elevated element of the ADP Alternative. Within the context of the new multistory rental car center, the Stage 2 - West APM would be a minor alteration of the existing landscape. The church is eligible for the National Register under Criterion A for its historic associations with the Golden Gate Barrio. The setting is not an important characteristic of the Sacred Heart Church because it was drastically altered when the surrounding residential areas and street grid were removed after the property was incorporated into the airport. Therefore, the ADP Alternative would have no adverse visual effect on the historic integrity of the building.

The other four properties would be subject to potential visual impacts as a result of the elevated segments of the Stage 2 - East APM and the APM maintenance and control facility. The Stage 2 - East APM would be elevated for approximately 1,000 feet north of the East Economy Parking Garage to cross over both eastbound and westbound Sky Harbor Boulevard and an on-ramp. The top of the guideway structure would be approximately 45 feet above Sky Harbor Boulevard, which is depressed below normal grade at this location. The APM guideways would enter tunnels south of the Sky Harbor Boulevard off ramp and be below grade for a distance of approximately 3,000 feet, paralleling the Sky Harbor Expressway (SR 153) and passing beneath the Union Pacific Railroad tracks under the existing bridge that carries the tracks across the depressed Sky Harbor Expressway. The APM alignment would then turn to the west and rise above grade approximately 250 feet north of the railroad. The northern elevated section, which is about 1,500 feet long, would turn to the north to cross over the Grand Canal on an elevated structure, and remain elevated to the south side of Washington Street where a station would be built to connect with the Valley Metro Rail Light Rail station west of 44th Street.

TABLE 4.11.3-2
POTENTIAL VISUAL IMPACTS

Site Name/Number		Location	Description	National Register Status	Effect[1]
1	Sacred Heart Church	900 S. 17th St., about 1/2 mile from Stage 2 - West APM	Church built in 1956	Eligible, Criterion A[1]	Minor change to setting, no adverse effect
2	Grand Canal	South of Washington St., crossed by Stage 2 - East APM	Canal built in 1878	Eligible, Criterion A[1]	APM would cross canal on elevated structure, maintenance and control facility would be built next to canal in a previously developed area, no adverse effect
3	Phoenix Main Line of Southern Pacific Railroad (now Union Pacific)	South of Jackson St., crossed by Stage 2 - East APM	Railroad built in 1924-1926	Eligible, Criterion A[1]	APM would cross beneath tracks under existing bridge, maintenance and control facility would be built next to tracks in previously developed area, no adverse effect
4	Pueblo Grande Museum and Archaeological Park	4619 E. Washington St., east of Stage 2 - East APM across Sky Harbor Expressway	Prehistoric ruin	Listed, Criteria A and D, eligible, Criterion C; National Historic Landmark	Elevated section of APM and station, and maintenance and control facility would be within 250 to 1,000 feet of park boundary, no adverse effect
5	Tovrea Castle (El Castillo)	5041 E. Van Buren St., about one mile east of Stage 2 - East APM	Four-story, folk art tower built in 1928-1930	Listed, Criteria A and C; Phoenix Register, and Historic Landmark	Minor change to setting, no adverse effect

[1] These are eligibility and effect determinations made by FAA in consultation with the SHPO; refer to Section 3.9.1 for definition of criteria.
Source: City of Phoenix Aviation Department, SHPO files, Maricopa County Assessor Records.

The elevated guideway structure, supporting piers, and station structure have yet to be designed, but the elevated guideway structure is expected to be approximately 11 feet deep and approximately 23 to 27 feet above the existing grade. The height of the station structure could be the equivalent of a two- to four-story building, or taller. A maintenance and control facility would be developed between the railroad tracks and the Grand Canal adjacent to the APM alignment. This facility also has yet to be designed, but is unlikely to be substantially taller than the elevated guideway.

The Grand Canal and Phoenix main line of the Southern Pacific Railroad (now Union Pacific) are eligible for the National Register under Criterion A, primarily for their historic associations with the development of irrigation agriculture and transportation, respectively. The settings of the canal and railroad are not character defining aspects of their historic values because urbanization has highly altered the historical rural landscape that once surrounded these linear features at this location. Construction of the elevated APM guideway, adjacent station, and maintenance and control facility, would replace the current commercial and light industrial buildings in the area but these changes in the visual setting of the canal

and railroad are not expected to adversely affect their historic qualities that make them eligible for the National Register.

The Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park is located on the east side of the Sky Harbor Expressway (SR 153) opposite from the northern end of the proposed Stage 2 - East APM corridor and the APM maintenance and control facility. The landmark is eligible for the National Register under Criterion A for its associations with the development of prehistoric and early historic-era irrigation, the history of the City of Phoenix because it was the first archaeological park set aside by the city, the development of Southwestern archaeology, and with the history of several Indian tribes. The SHPO also considers the architectural ruins of the park to be eligible under Criterion C because they embody characteristics of a distinctive type of aboriginal construction. The landmark also is listed under Criterion D for having yielded important archaeological information and for its potential to yield additional information.

The elevated Hohokam Expressway (SR 143) clearly demarcates the eastern side of the park. The broad Washington Street marks the northern edge. Several multi-story commercial and office buildings have been developed north of the park. The Crowne Plaza hotel on the northwest corner of Washington Street and 44th Street, just north of the proposed interconnection of the APM and the Light Rail Transit station, is the tallest at approximately 10 stories. Although the land immediately north of the park has been cleared and currently is vacant, it too is planned for commercial development. Views to the south of the park are more open because the clear zone at the eastern end of the Airport runways borders the southern park boundary. The Sky Harbor Boulevard and large circular ramps are visible in that direction. The Salt River, which was an important feature of the setting of the Pueblo Grande site when it was occupied, is now dry except during floods and has been shifted south of Sky Harbor Boulevard and confined to an engineered channel. The Sky Harbor Expressway (SR 153) defines the western border of the park and the area beyond, where the proposed Stage 2 - East APM and APM maintenance and control facility would be built, is occupied by light industrial and commercial properties, mostly with one-story buildings. Views in this direction include power lines, tall metal storage tanks, and billboards. From many places within the park, museum buildings, walls, and trees screen views to the west. A canal and railroad cross through the park, but those features have attained their own historic values.

The park has been expanded from the original 5 acres acquired in 1924 to more than 100 acres. The expanse of the park and use of sensitively designed museum buildings, perimeter walls, and natural vegetation creates a sense of place appropriate for interpreting a prehistoric ruin. Nevertheless, the urban development surrounding the park and the noise of traffic and airplanes make it obvious to visitors standing on the platform mound that the park is in the middle of a large metropolitan area.

The guideway structure for the approximately 1,500-foot-long elevated section at the north end of the Stage 2 - East APM would be about 400 to 1,000 feet west of the western boundary of the Pueblo Grande Museum and Archaeological Park. The elevated station at the interconnection with the Light Rail Transit would be about 600 feet west of the park boundary. The parcel on which the APM maintenance and control facility would be built is approximately 250 to 1,000 feet west of the western edge of the park. The approximately 1,000-foot-long elevated section of the Stage 2 - East APM on the north side of the East Economy Parking Garage is about 1,000 feet south of the park boundary. The extent of the visual

changes cannot be fully assessed until the proposed facilities are designed in more detail. FAA notified the National Park Service and the Advisory Council on Historic Preservation to consult about the potential adverse effects on the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark (refer to Appendix A). The FAA concluded, in consultation with the SHPO, that a sensitive design of the proposed facilities, considering factors such as massing, style, color, texture, glare, and potential for screening with vegetation, would have no adverse effect on the park.

The Tovrea Castle is listed in the National Register under Criterion A and C for its association with the history of resort and residential development in Phoenix, and the folk art style of the Castle and its surrounding cactus garden. The setting of the Castle within the rock wall that borders the property is being protected by the City of Phoenix, which has acquired and is developing the property for heritage tourism. Urban development and construction of the elevated Red Mountain Freeway (SR 202) and Hohokam Expressway (State Route 143) have substantially altered the historic setting of the property outside the rock wall. The Stage 2 - East APM facilities would be visible from the hill on which the Castle is located, on the opposite side of the elevated Hohokam Expressway (SR 143). The APM facilities would not be visible from lower elevations within the Tovrea Castle parcel. Because the Tovrea Castle is approximately 1 mile from the APM facilities, the project would result in only a minor change in views from the Castle. The ADP Alternative would not have an adverse effect on the historic qualities that make the Tovrea Castle eligible for the National Register.

4.11.4 Potential Mitigation Measures

In 2002, the FAA initiated Section 106 consultations with the Phoenix CHPO, Phoenix City Archaeologist, and SHPO when studies for the ADP Alternative began. Affiliated Federally recognized tribes were contacted in 2003. The assessment of potential impacts concluded that the ADP Alternative could result in adverse effects as a result of disturbing archaeological sites. See Chapter 5.0 for potential mitigation measures associated with the ADP Alternative.

4.12 LIGHT EMISSIONS AND VISUAL IMPACTS

4.12.1 Overview of Impacts

The No-Action Alternative would not result in any additional impacts to light sensitive areas in the year 2015. The No-Action Alternative assumes that the ADP would not be constructed and that no additional visual impacts would occur.

Implementation of the ADP Alternative would result in additional light emissions; however, these emissions are not expected to result in a significant visual impact to off-property areas in the general vicinity of PHX. Impacts would comply with Section 23-100 of the Phoenix city code. The ADP Alternative and associated developments are common features of an international airport and urban area such as the City of Phoenix.

Development of the APM Stage 2 maintenance facility and APM/LRT station, to be located in the northeast corner of PHX, could be visible to sensitive offsite cultural resources such as the

Pueblo Grande Museum and Tovrea Castle property. Potential visual impacts to these properties are discussed in Section 4.11, Historic, Architectural and Cultural Resources, of this FEIS.

4.12.2 METHODOLOGY

The existing terminal lighting, lighting associated with current landside and airside operations, and lighting from vicinity infrastructure was identified and assessed. The potential impact of light emissions and visual impacts from the ADP Alternative to light sensitive areas within the vicinity of PHX was qualitatively assessed.

4.12.3 YEAR 2015 IMPACT POTENTIAL

No-Action Alternative

The No-Action Alternative assumes that the ADP Alternative would not be constructed and that no additional visual or light emission impacts would occur.

Airport Development Program Alternative

A qualitative evaluation of aviation-related lighting systems for the ADP Alternative was conducted to determine any potential adverse light emission impacts on sensitive areas, particularly residences. Because the number and type of future aircraft operations would be the same for the No-Action and ADP Alternatives, future light emission levels from airborne and taxiing aircraft are not projected to significantly change in surrounding residential areas in the vicinity of the airport when compared to the No-Action Alternative. Because the proposed Taxiway "U" and "V" would be elevated approximately 13 feet above the existing ground level to cross Sky Harbor Boulevard, the visibility of aircraft when transiting these taxiways would be increased.

The ADP Alternative would result in the installation of new lighting systems. These systems would be expected to be similar to Terminals 2, 3 and 4, and would include the following:

- Pole and building-mounted area flood lights to illuminate terminal building exteriors; portions of aircraft parking aprons; access roads; walkways; parking garages; parking lots, and other related outdoor improvements. These types of lights are expected to be standard exterior floodlights utilizing mercury, sodium, or other bulbs suitable for each application. The area floodlight fixtures, as appropriate for each application, would provide some directional shielding to enhance area lighting and reduce glare.

- Edge lighting would be installed along new taxiways and entrances to aircraft parking aprons. Lighted directional signs would also be installed, as appropriate, to provide directional guidance to the proposed airside facilities.

- Lighting would be provided for the APM Stage 2 Maintenance Facility, ARM/LRT station and passenger terminal. Lighting would also be provided along APM track structures.

- Ancillary lighting would be associated with illuminating parking access control facilities and passenger walkways.

- Temporary exterior lighting may also be installed at construction staging areas and project work sites. No new approach lighting systems, beacons, or high-intensity strobes are associated with the ADP Alternative. The number and specific type of lighting systems described above would be determined in the design process for the ADP Alternative.

- Development of new roadway and signage lighting systems for Sky Harbor Boulevard and associated roadways.

The area surrounding PHX is an urban landscape. The airport is encircled by major highways and other local roads presently illuminated by streetlights. Nearby residential areas are located in the vicinity of various businesses and cargo buildings (especially north of the airport), rental car facilities, Air National Guard facilities, and parking facilities. While residential light-sensitive areas are located in the GSA, they are not located immediately adjacent to PHX. Therefore, because the number and type of future aircraft operations would be the same for the No-Action and ADP Alternatives, future light emission levels from airborne and taxiing aircraft would not adversely impact surrounding residential areas in the vicinity of the airport.

The major component of the ADP Alternative development activities are to be constructed in the central core of the airport (**Figure 1.1-2**) and would have no visual impact on any offsite resource or land use. The proposed terminal complex would be developed in context with the existing terminals and concourses at PHX and would include architectural colors and textures compatible with the surrounding area. The crossfield taxiways and roadway modifications are also located within the central core of the airport and would therefore not constitute a visual impact to offsite resources.

Development of the APM Stage 2 would be accomplished through the central core of the airport and along the eastern boundary of the airport property (**Figure 1.1-2**). APM Stage 2 development would include construction of an APM maintenance facility and APM/LRT station in the northeastern corner of the airport. Due to its location, there is a potential that the APM maintenance facility and APM/LRT station would be visible to sensitive offsite resources such as the Pueblo Grande Museum and Tovrea Castle which are located in the vicinity of the maintenance facility (see **Figure 4.12-1**). The City Aviation Department has coordinated with the SHPO and CHPO with respect to potential visual impacts to historic resources in the vicinity of the Airport. As a result of these consultations the City will be required, and has agreed, to further coordination with the SHPO, CHPO, and other interested parties at a later date, as APM Stage 2 design documentation is being developed. This purpose of this later coordination would be to incorporate resource sensitive design concepts into the APM Stage 2 such that potential impacts to offsite resources would be minimized. Additional discussion on visual impacts and sensitive receptors is provided in **Section 4.11**, Historic, Architectural and Cultural Resources, of this FEIS.

4.12.4 POTENTIAL MITIGATION MEASURES

No significant light emission or visual impacts would occur to non-sensitive resources that would impact the general land use characteristics of the generalized study area; therefore, mitigation measures for these resources would not be warranted. Impacts would comply with Section 23-100 of the Phoenix city code. For potential mitigation of possible visual impacts on Historic, Architectural and Cultural Resources, refer to **Section 4.11**, of this FEIS.

4.13 NATURAL RESOURCES AND ENERGY SUPPLY

4.13.1 OVERVIEW OF IMPACTS

Resource utilization and energy supply requirements are based on aircraft, support equipment/vehicles, and facilities such as terminals, parking, and maintenance buildings.

The number of aircraft operations at PHX is expected to be the same for the No-Action Alternative and the ADP Alternative through the 2015 study period. When compared to the No-Action Alternative, the consumption of aviation fuel is expected to decrease slightly due to lower aircraft taxi delays associated with the proposed crossfield taxiways.

Demand for electrical and heating energy would increase approximately 21 percent with the implementation of the ADP Alternative due to the increased square footage of the West Terminal Complex over existing Terminal 2 and development of additional lighted airfield surfaces. However, this demand for fuel and electrical power can be met without resulting in significant impacts to the region's energy supply, distribution networks, and infrastructure. Design of the ADP facilities would be accomplished to incorporate systems to reduce electrical and heating energy demand. These systems could include the use of solar technology and other technologies as determined to be prudent and feasible with respect to construction cost and operational reliability.

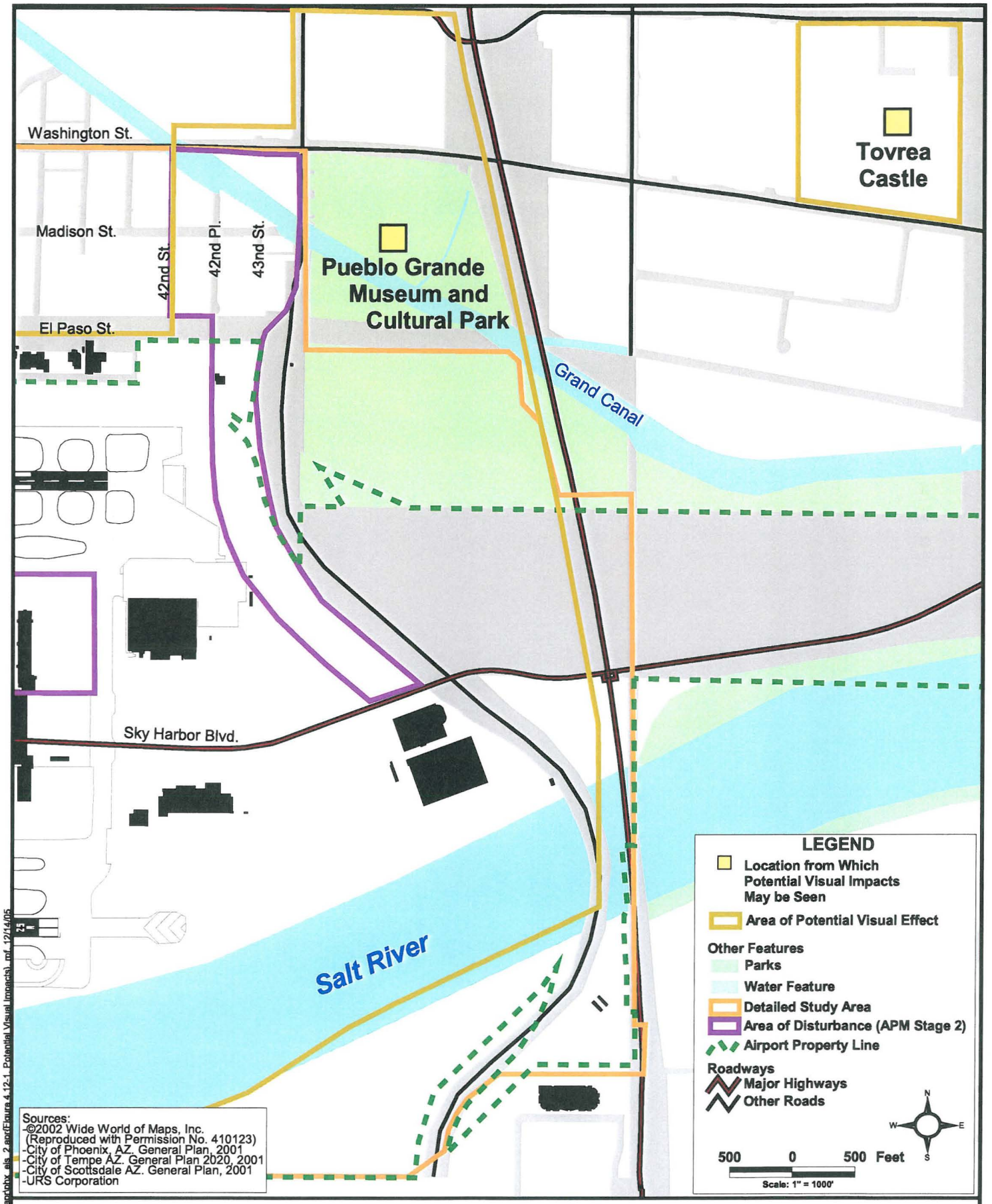
There are no known sources of mineral or energy resources in the DSA that would be adversely affected by the ADP Alternative. Development of any of these alternatives would not require the use of unusual materials or those that are in short supply in the Phoenix region. Since the ADP Alternative would not result in significant energy supply and natural resource impacts, mitigation may not be required.

4.13.2 METHODOLOGY

Energy Supply – Future fuel utilization at PHX for the No-Action and ADP Alternatives was calculated based on the projected number of aircraft operations as contained in the FAA-approved forecast of future aviation activity at PHX (LFA, 2003). For consistency, the times in mode, engine information, and fuel flow were obtained from information and databases used for the air quality analysis in Section 4.2 of this FEIS. These databases represent the latest FAA information for aircraft and engines.

For climbout and approach, only fuel consumption below 3,000 feet was considered. Total fuel use, which combines Avgas and Jet A, for each year was measured in gal/year. The calculations are shown in Appendix I of this FEIS.

Electrical energy requirements for the No-Action Alternative and the proposed ADP Alternative were developed based on preliminary West Terminal facility design information and reported electric power usage for Terminal 4 during the period June 2002 through May 2004.



G:\Phoenix_eis\Applications\arcpbx_eis_2.apr(Figure 4.12-1 Potential Visual Impacts).mxd 12/14/05

Phoenix Sky Harbor International Airport
Environmental Impact Statement

Facilities Potentially Affected by Visual Impacts

FIGURE 4.12-1

Natural Resources - Review of aerial photographs, USGS Topographic 7.5 Minute Series Quadrangles for counties, and land use maps were used to determine if the ADP Alternative would impact any natural sources of mineral or energy resources.

4.13.3 YEAR 2015 IMPACTS

During 2001, the baseline study year, the use of aviation fuel at PHX was approximately 24.1 million gallons. Aircraft operations during this same period totaled 553,310. Future fuel consumption during 2015, the EIS study year, will increase for both the No-Action and ADP Alternatives in response to the forecast increase in aircraft operations ground operating time. The results of the 2015 impact analysis are described below.

4.13.3.1 No-Action Alternative

Energy - The projected use of aviation fuel at PHX during 2015 for the No-Action Alternative has been calculated to be 55.6 million gal/yr based on an operational level of 670,000 operations (Table 4.13.3-1) and an increase in average taxi time from 19.74 minutes in 2001 to 53.3 minutes in 2015 (Ricondo, 2003). The 2015 No-Action fuel usage represents an increase of approximately 31.5 million gal/yr from 2001 levels.

TABLE 4.13.3-1
2015 ESTIMATED ENERGY CONSUMPTION (AVIATION FUEL)

Alternative	2015 Fuel Consumption* (million gal/yr)	Increase in Fuel Consumption from 2001 Baseline
No-Action	55.6	31.5
ADP Alternative	53.6	29.5

* Includes Avgas and Jet A used during LTO cycle (engine power setting modes including approach, taxi/idle, takeoff, and climbout); calculations shown in Appendix I.

Source: URS Corporation, 2004.

The No-Action Alternative would also necessitate the use of hardstand aircraft parking positions and the transfer of passengers between aircraft and terminal facilities via bus. The use of hardstands is projected to total approximately 148 operations during the peak day period (Ricondo, 2004). Based on the analysis of hardstand positions available at PHX, it was estimated that buses would travel an average distance of 1.6 miles per operation for the loading and unloading of passengers resulting in a total busing distance of approximately 236.8 miles per day. A conservative estimate of the total annual bus travel distance for passenger loading and unloading is estimated to be approximately 86,400 miles per year based on 7-day per week operation. Annual fuel usage for the bus trips associated with hardstand operations (assuming 4 mpg per bus) would be approximately 21,600 gal/year.

Electric power consumption for terminal facilities would not be significantly increased with the No-Action Alternative because no new facilities would be constructed however, additional apron lighting for hard-stand operation would likely occur. Renovations could offer some energy saving features, and would be incorporated in future design activities. Some additional airfield/apron lighting would be required to support hardstand aircraft parking locations.

Natural Resources - No construction would occur with the No-Action Alternative; therefore, the No-Action Alternative would not result in natural resource impacts. As discussed in **Section 4.17.3**, the water consumption and waste water generation would increase in proportion to airport activity.

4.13.3.2 Airport Development Program Alternative

The ADP Alternative is projected to result in the same number of aircraft operations as the No-Action Alternative. Therefore, the difference in fuel usage between the two alternatives would be the reduction in ground delays associated with the ADP Alternative's crossfield taxiways.

Energy - The ADP Alternative includes development of new taxiways "U" and "V" on the west side of the airport. Development of these taxiways will reduce ground delays for aircraft movement by as much as 0.6 minutes per aircraft operation. As a result, fuel consumption associated with the ADP Alternative would be lower than the No-Action Alternative. The ADP Alternative fuel consumption would be 53.6 million gal/yr in comparison to 55.6 million gal/yr for the No-Action Alternative (**Table 4.13.3-1**). The addition of the crossfield taxiways would reduce average taxi times from 53.3 to 50.9 minutes per operation (Ricondo, 2003). In addition to the savings in aircraft ground operating time and aviation fuel, there would be no requirement for hardstand and busing operations which would save the approximately 21,600 gallons of fuel required to support the busing operations on an annual basis.

The proposed West Terminal Complex, taxiways, and associated projects with the ADP Alternative would increase electrical energy demand at PHX in order to provide taxiway lighting and interior and exterior terminal lighting, air conditioning, and other electrical needs. Based on preliminary design information for the ADP Alternative (DMJM Aviation/HDR, 2004), the increase in electric usage to support terminal operations is estimated to be approximately 38,900 mw/hr per year, based on the overall size of the West Terminal in relation to the existing Terminal 2. This represents an increase of approximately 35 percent above the usage required for the existing Terminals 2, 3, and 4. A review of the generating capacity statistics for Arizona Public Service (APS) indicates that sufficient generating capacity would be available to serve the construction and operational needs of the ADP Alternative. New distribution capacity would likely be required to support the additional electrical demand of the ADP Alternative. New distribution installations would be done in accordance with the existing APS extension policy which is on file with the Arizona Corporation Commission.

Natural Resources - Implementation of the ADP Alternative would not impact any known natural supply of mineral or energy resources considered to be unusual in nature or in short supply. Construction of the ADP Alternative is expected to utilize common building materials such as asphalt, concrete, steel, and base/sub base materials, none of which are of a unique nature or in short supply in the Phoenix region. Therefore, the development of the ADP Alternative would not result in natural resource impacts. Water usage at the airport will increase with the ADP Alternative. **Section 4.17.3** presents a discussion of potential water resource impacts.

4.13.4 MITIGATION MEASURES

Both the No-Action Alternative and the ADP Alternative would result in less than significant energy supply and natural resource impacts. Implementation of the ADP Alternative would result in a decrease in 2015 fuel utilization rates as composed to the No-Action Alternative. The incorporation of energy efficient designs, pollution prevention techniques and context sensitive planning and construction techniques would further reduce the potential for impacts. In order to further evaluate pollution prevention and sustainable resource opportunities at the airport, the City of Phoenix has entered into an Intergovernmental Agreement with Arizona State University-Tempe to support the advancement and sharing of sustainable technology research and use of existing and emerging sustainable technologies on new airport construction projects (City of Phoenix, IGA 112503, June 2004).

4.14 NOISE

4.14.1 OVERVIEW OF IMPACTS

An evaluation of the potential of the proposed ADP Alternative to result in noise impacts was accomplished. There would be no change in aircraft operations between the No-Action and ADP Alternatives. Therefore, there would be no change in the noise exposure contours for the ADP Alternative when compared to those for the No-Action Alternative. Accordingly, there would be no significant aircraft noise impacts (increase in 1.5 dB within the 65 DNL contour) as a result of the ADP Alternative. In terms of possible impacts to land uses, in 2015 off-airport acreage impacts would include approximately 243 acres of residential land use within the 65 Day-Night Average Sound Level (DNL) contour for both the No-Action Alternative and the ADP Alternative.

It should be noted that, a revision was made to the flight track data presented in the DEIS for both the No-Action and ADP Alternatives 2015 noise analysis to reflect the suspension of the Runway 25L Side-Step Procedure. On March 27, 2002, following the failure of the flight check of the Side-Step Procedure it was suspended. The Side-Step Procedure was replaced with a straight-in Visual Approach to Runway 25L. In order to accurately depict and evaluate potential noise impacts resulting from the proposed project, the noise analysis presented in the DEIS was reevaluated. The noise exposure contours were re-run using the INM Version 6.1 model and are presented in this FEIS. The straight-in flight tracks are illustrated in Figure B-1-21, Figure B-1-22, and Figure B-1-23 of this FEIS. Results of the No-Action and ADP Alternative noise analysis are presented in Section 4.14.3 of this FEIS.

4.14.2 METHODOLOGY

This section describes the data and methodologies used to develop the noise exposure contours and evaluate the impact potential for the No-Action and ADP Alternatives. Additional details regarding methodology are included in Appendix B-1, Section 1.1.1. The operations data described herein constitute the input for the future condition noise exposure contours.

Preparation of airport noise exposure contours requires the compilation of several types of information regarding aircraft operations at the airport. Specifically, operational data include types of aircraft, time of day, runway use, and flight track use. The data categories are identical to those previously described and presented in **Section 3.1.2** for the 2001 Baseline Conditions. The detailed information of aircraft operational data is presented in **Appendix B-1**.

Section 4.14 addresses aircraft noise. Surface transportation noise is addressed in **Section 4.20**. Construction noise is addressed in **Section 4.5**.

4.14.2.1 Physical Input

Physical input parameters include runway layout, runway utilization, and flight tracks. The ADP Alternative is not expected to result in changes to the current runway layout, runway utilization, or airspace configurations. Therefore, these parameters are identical for the No-Action Alternative and the ADP Alternative. It should be noted that a revision was made to the flight track data presented in the DEIS for both the No-Action and ADP Alternatives 2015 noise analysis to reflect the suspension of the Runway 25L Side-Step Procedure. On March 27, 2002, following the failure of the flight check of the Side-Step Procedure, it was suspended. The Side-Step Procedure was replaced with a straight-in Visual Approach to Runway 25L. The purpose of the straight-in Visual Approach was to allow aircraft to be on the glide path and for pilots to preplan their arrival in a timely manner. On December 2, 2002, following an environmental review in accordance with FAA Order 5050.4A, Airport Environmental Handbook, and in accordance with the criteria contained in FAA Order 1050.1D, Policies and Procedures for Considering Environmental Impacts, the FAA categorically excluded the Runway 25L Side-Step Procedure from further environmental review and documentation. As detailed on page 1 of the Categorical Exclusion, the basis for this determination was the following: "The Runway 25L landing threshold is located 2,500 feet west of the Runway 25R landing threshold. After realigning with Runway 25L, the aircraft is below the glide path due to the displaced threshold. In addition to being below the glide slope, the Side-Step Procedure caused untimely communications between pilots and ATC, frequently requiring immediate action on the part of pilots, and led to uncertainty in the cockpit, inefficient runway utilization, and unplanned missed approaches. These significant safety concerns were identified by the National Air Traffic Controllers Association (NATCA) and the Air Carrier community." In order to accurately depict and evaluate potential noise impacts resulting from the proposed project, the noise analysis presented in the DEIS was reevaluated. The noise exposure contours were re-run using the INM Version 6.1 model and are presented in this FEIS. The straight-in flight tracks are illustrated in **Figure B-1-21**, **Figure B-1-22**, and **Figure B-1-23**. The categorical exclusion document is included in **Appendix B-3**. Results of the No-Action and ADP Alternative noise analysis are presented in **Section 4.14.3** of this FEIS.

As stated in **Section 3.1.2**, two runway utilization rates were established for the 2001 Baseline Condition. It was assumed that the year 2015 would have a typical aircraft operational environment throughout the year. Thus, the 2001 Normalized Condition runway utilization was used for the 2015 future condition noise modeling. **Table B-1-15** in **Appendix B-1** provides the runway utilization for air carriers, cargo, general aviation, and military aircraft operations by aircraft category and time of day.

Figures B-1-1 through B-1-18 in Appendix B-1 depict the departure and arrival flight tracks by runway ends and aircraft categories. Tables B-1-12 and B-1-13 in Appendix B-1 show detailed information regarding departure and arrival flight track utilization by jet, turboprop, and prop aircraft.

4.14.2.2 Aircraft Operations and Fleet Mix

Aviation demand forecasts for PHX (LFA, 2003) were approved by the FAA in 2003. The forecast data indicate that passenger enplanements at PHX will increase from 18.6 million passengers in 2003 to approximately 25.2 million in 2015 (LFA, 2003). The proposed improvements would not increase the number of aircraft operations at PHX, but would provide additional landside facilities and improve the efficiency of airport operations. According to the Aviation Demand Forecasts, 670,000 operations are projected to occur in 2015 (an increase of 116,670 and 128,229 operations when compared to the operations in 2001 and 2003, respectively). The projected number of aircraft operations by operational category and aircraft body type was provided in the Aviation Demand Forecasts (LFA, 2003). The growth in passenger enplanements and aircraft operations at PHX is indicative of the vibrant population and economic growth of the Maricopa County region. The increased availability of aircraft gates to be developed as part of the ADP Alternative will enable PHX to efficiently meet the forecast demand and maintain an acceptable level of service. As discussed in Section 1.2, Purpose and Need, increases in demand at an airport can almost always be traced to causes other than facility improvements. Conversely, major facility improvements are rarely the cause of an increase in demand.

Table 4.14-1 provides a summary of the 2015 aircraft operations by operational category derived from the Aviation Demand Forecasts. Detailed information regarding aircraft operations and fleet mix is included in Appendix B-1, Section 2.0.

The most significant change projected to occur between the 2001 Baseline Condition and the 2015 future condition is the air carrier fleet mix. Recently, most air carriers have retired their older aircraft types as a result of decreased demand and increasing maintenance and fuel costs. Benefits and advantages of replacing older and noisier aircraft with newer and quieter aircraft are lower maintenance costs, lower fuel cost, increased operational efficiency, and less noise impact. The detailed assumptions regarding the air carrier fleet mix are described in Appendix B-1.

4.14.3 YEAR 2015 IMPACT POTENTIAL

Since all physical input parameters, aircraft operations, and fleet mix are identical for the 2015 No-Action Alternative and the ADP Alternative; the 2015 noise exposure contours are identical for the No-Action Alternative and Proposed Action. Given that the noise exposure contours for the ADP Alternative are identical to those for the No-Action Alternative, there would not be an increase of 1.5dBA within the DNL 65 dBA noise contour as a result of the ADP Alternative in the 2015 Future Condition.

The FAA use the INM Version 6.1 to calculate aircraft noise levels associated with the No-Action and ADP Alternatives.

TABLE 4.14-1
2015 ANNUAL AIRCRAFT OPERATIONS SUMMARY

Operational Category	Body Type	Aircraft Type	Annual Operations
Air Carrier	Wide-Body	B747-400, B767-200/-300, B777-200, A340	13,568
	Boeing 757	B757-200	40,693
	Narrow-Body	B717-200, B737-500/-700/-800, A319, A320	388,689
	Regional Jet	Embraer 135, CRJ200	105,850
	Turboprop	Beech 1900, Cessna 421	23,200
Subtotal			572,000
Cargo	Wide-Body	B767-200/-300, A300, A310, DC10, MD11	1,400
	Boeing 757	B757-200	2,800
	Narrow-Body	B727-200, B737-300, A320, DC8, DC9	8,400
	Regional Jet	Lear Jet 35	4,600
	Turboprop	Cessna 208, Piper 28/32, Beech 1900, SW3	12,800
Subtotal			30,000
General Aviation			63,000
Military			5,000
Grand Total			**670,000**

Source: Leigh Fisher Associates, 2003.

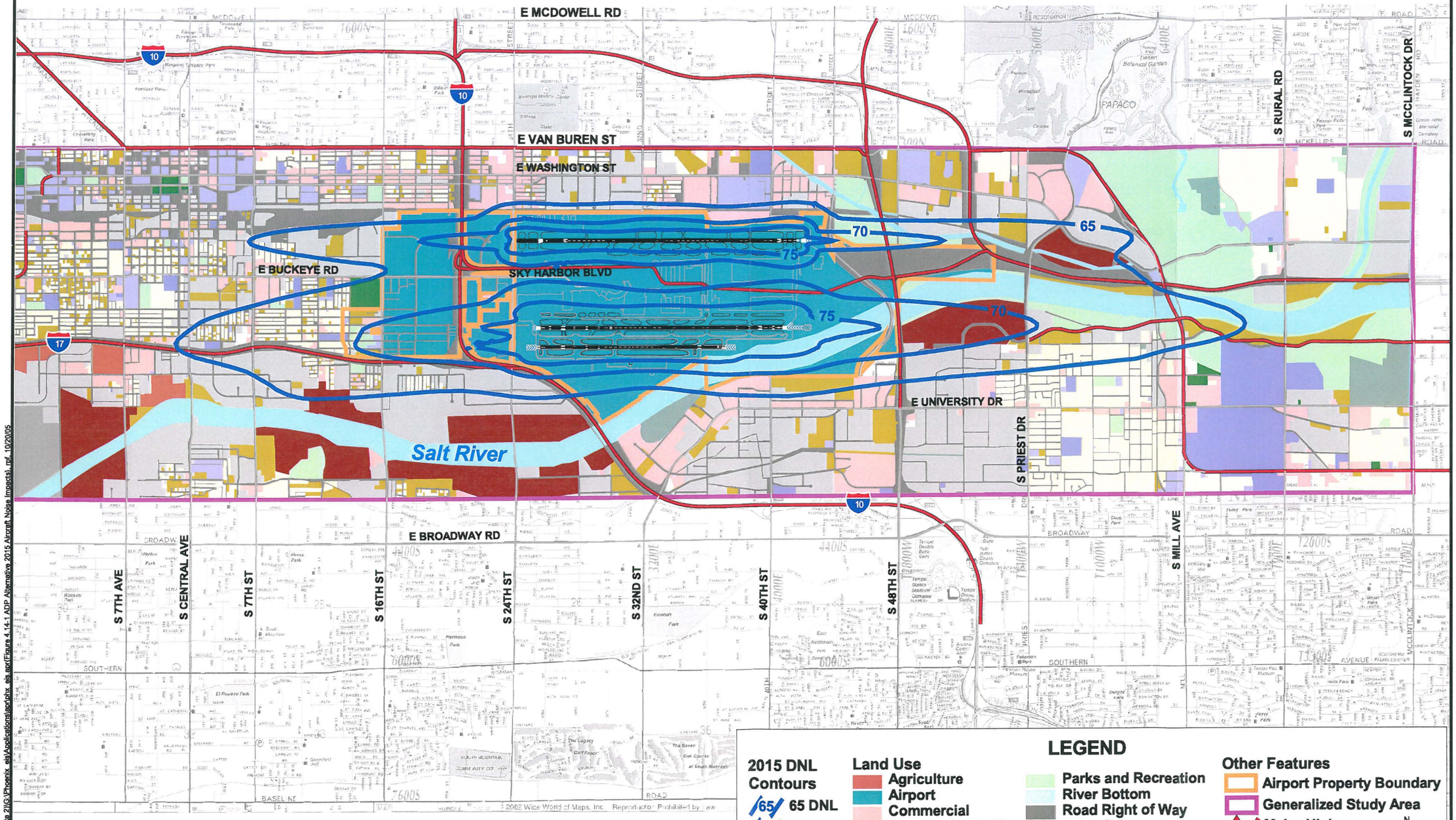
4.14.3.1 Noise

Noise exposure levels resulting from the No-Action and ADP Alternative are depicted as DNL contours in Figure 4.14-1. Total land area within the DNL 65 dBA contour is approximately 5,983 acres.

Affected Population - The FAR Part 150 land use compatibility guidelines indicate that residential land use is considered incompatible at or above DNL 65 dBA. A Geographic Information System (GIS) was used to identify land use distribution. The data used to calculate impacted population and households were obtained from U.S. Bureau of the Census, Census 2000 TIGER/Line Data, Block Level STF1 Demographic Data. There are several residential areas located within DNL 65 dBA of the No-Action and ADP Alternatives, as shown in Figure 4.14-1. Table 4.14-2 indicates that approximately 1,880 housing units with approximately 5,975 people would be impacted within the DNL 65 dBA of the No-Action and ADP Alternatives.

There are 8 hotels located within DNL 65 dBA noise contour. Their location, number of rooms, average occupancy rates, and DNL are shown on Table 4.14-3. Hotels are commonly considered as commercial land use. However, for the purpose of determining land use compatibility, they are considered transient lodging, which is a type of residential land use. FAR Part 150 land use guidelines indicate transient lodging is not compatible at or above DNL 65 dBA.

Specific Point Analysis Locations - Single-point DNL noise exposure analyses for the No-Action and ADP Alternatives were conducted for 169 locations within the GSA. These locations are depicted in Figure 4.14-2. Table 4.14-4 identifies the DNL noise exposure for each of the 169 locations. Because the assumptions for aircraft operations, fleet mix, and other operational parameters are the same for the No-Action and ADP Alternatives, the single-point DNL noise exposure values are the same for both the No-Action and ADP Alternatives.



Sources:
-©2002 Wide World of Maps, Inc.
(Reproduced with Permission No. 410123)
-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

LEGEND

2015 DNL Contours
- 65 DNL
- 70 DNL
- 75 DNL

Land Use
- Agriculture
- Airport
- Commercial
- Community Facility
- Government
- Heavy Industrial
- Light Industrial
- Mining/Extractive
- Parks and Recreation
- River Bottom
- Road Right of Way
- School
- Residential
- Transient Residential
- Utilities
- Vacant/Undeveloped

Other Features
- Airport Property Boundary
- Generalized Study Area
- Major Highways
- Other Roads

0 4000 Feet
Scale: 1" = 4000'

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

ADP Alternative 2015 Aircraft Noise Impacts

FIGURE 4.14-1

c1_516/c1c1_375-GIS Data 2\GIS\Phoenix_eis\Applications\mxd\chx_eis.mxd\Figure 4.14-1 ADP Alternative 2015 Aircraft Noise Impacts\ jmf, 10/20/05

E MCDOWELL RD

E VAN BUREN ST

E WASHINGTON ST

E BUCKEYE RD

E SKY HARBOR BLVD

E UNIVERSITY DR

E BROADWAY RD

S RURAL RD

S MCCLINTOCK DR

S MILL AVE

S PRIEST DR

S 19TH AVE

S 7TH AVE

S CENTRAL AVE

S 7TH ST

S 16TH ST

S 24TH ST

S 32ND ST

S 40TH ST

S 48TH ST

65

70

75

LEGEND

Sites
- Hospital
- Church
- School
- Park/Recreation
- Hotel

2015 Future DNL Contours
- 65 DNL
- 70 DNL
- 75 DNL

Roadways
- Major Highways
- Other Roads

Other Features
- Generalized Study Area
- Water Body
- Airport Property Boundary

0 4000 Feet

Scale: 1" = 4000'

N W E S

c1_519\cd\c1_375-GIS Data 2\IGs\Phoenix_eis\Applications\arcIphx_eis.apr(Figure 4-14-2, 2015 Future Condition Specific Point Analysis Sites)_mf_09/20/05

Phoenix Sky Harbor INTERNATIONAL AIRPORT

Environmental Impact Statement

2015 Future Condition
Specific Point Analysis Sites

FIGURE 4-14-2

4.14.3.2 Compatible Land Use

The FAA has adopted guidelines regarding the compatibility of land uses with various noise levels measured using the DNL metric. These guidelines are listed in Table 3.1.3-4.

TABLE 4.14-2
FUTURE CONDITION, 2015 NOISE CONTOURS

Area By Land Use (Acres)	DNL 65-70 dBA	DNL 70-75 dBA	DNL 75+ dBA	Total
Airport	848.7	970.7	958.6	2,778.0
Commercial	124.5	5.0		129.5
Community Facility	14.1	9.0		23.1
Government	33.4			33.4
Hotel/Transient Residential	31.1	2.2		33.3
Light Industrial	677.8	13.1		690.9
Mining/Extractive	110.4	139.2		249.6
Parks and Recreation	172.0	52.9	0.0	224.8
Residential	243.6			243.6
River	169.8	19.1		188.8
Road	829.0	166.1	6.9	1,002.0
School	18.2			18.2
Utilities	148.3	13.5	0.3	162.1
Vacant/Undeveloped	202.0	3.7		205.7
Total	**3.622.9**	**1,394.4**	**965.8**	**5,983.0**
Contour Area (Square Miles)	**5.6**	**2.2**	**1.5**	**9.3**
Population	**5,971**	**3**	**0**	**5,975**
Housing Units	**1,880**	**0**	**0**	**1,880**

Non-compatible Land use

Source: U.S. Bureau of the Census, Census 2000 Tiger/Line Data, Block Level STFI Demographic Data.

TABLE 4.14-3
HOTELS IN AIRPORT VICINITY
2015 FUTURE CONDITION

Site #	Hotel	Location	Number of Rooms	Average Occupancy Rate	DNL (dBA)
160	Best Western Airport Inn	2425 S. 24th St.	117	60%	68.7
163	Hilton Phoenix Airport	2435 S. 47th St.	255	70-100%	69.7
164	Courtyard by Marriott Phoenix Airport	2621 S. 47th St.	145	75-80%	68.1
165	Sleep Inn Airport	2621 S. 47th St.	105	60%	66.2
166	Southwest Inn at Eagle Mountain	1601 W. Rio Salado Pkwy	99	51%	69.7
167	Amerisuites Tempe Airport	1413 W. Rio Salado Pkwy	125	N/A	69.0
168	E-Z 8 Motels	1820 S. 7th St.	176	N/A	66.9
169	Pay Less Inn	515 E. Pima St.	N/A	N/A	65.3

Source: URS Corporation, 2003.

TABLE 4.14-4
DNL AT SELECTED SITES

Site #	Category	Name	2001 Existing Condition DNL	2001 Normalized Condition DNL	2015 Future Condition DNL
1	Church	First Hispanic Baptist Church	52.7	53.9	**54.4**
2	Church	First Presbyterian Church	52.7	54.3	**54.6**
3	Church	Unknown	60.9	61.6	**61.8**
4	Church	Tonto Church of Christ	61.3	61.7	**61.3**
5	Church	Unknown	61.2	61.7	**61.6**
6	Church	New Home Baptist Church	61.1	61.6	**61.7**
7	Church	Bethel CME	61.0	61.5	**61.1**
8	Church	Unknown	61.0	61.5	**61.3**
9	Church	Valley Christian Center	61.0	61.4	**61.2**
10	Church	Unknown	61.5	61.8	**60.7**
11	Church	Emmanuel Church Of God-Christ	61.2	61.5	**60.6**
12	Church	Unknown	61.1	61.5	**60.8**
13	Church	Unknown	61.1	61.5	**60.9**
14	Church	Unknown	61.4	61.7	**60.5**
15	Church	Our Lady Of Fatima	61.5	61.7	**60.6**
16	Church	Unknown	60.7	61.2	**61.1**
17	Church	Shiloh Baptist Church	61.8	62.2	**61.5**
18	Church	Berean Baptist Church	61.8	62.2	**61.5**
19	Church	Maricopa County Seventh Av	62.4	62.7	**61.6**
20	Church	Unknown	62.1	62.4	**61.3**
21	Church	House of Prayer-God In Christ	62.3	62.5	**61.4**
22	Church	St John Instnl Baptist Church	62.3	62.5	**61.4**
23	Church	Unknown	61.9	62.2	**61.1**
24	Church	Unknown	62.7	62.8	**61.7**
25	Church	Centro Christiano De Alabanca	63.0	63.1	**62.1**
26	Church	Unknown	62.5	62.5	**61.5**
27	Church	Lone Star Baptist Church	63.9	63.4	**62.8**
28	Church	Unknown	63.5	63.0	**62.9**
29	Church	Unknown	63.8	63.5	**63.2**
30	Church	Hope Evangelistic Community Center	67.3	67.0	**66.0**
31	Church	Unknown	62.1	62.6	**62.5**
32	Church	St. Anthony Catholic Church	62.2	62.8	**62.7**
33	Church	New World Educational Center	61.6	62.2	**62.2**
34	Church	Primera Iglesia Metodista	63.2	63.9	**64.0**
35	Church	Catholic Diocese	54.0	56.0	**55.5**
36	Church	Unknown	56.0	58.3	**57.1**
37	Church	Immaculate Heart Church	56.5	58.4	**57.8**
38	Church	First Institutional Baptist	57.8	59.8	**59.0**
39	Church	Tanner Chapel	56.6	58.5	**57.9**
40	Church	Open Door Church	56.0	58.3	**57.1**
41	Church	Pentecost Church-Jesus Christ	56.3	58.6	**57.4**
42	Church	Bethlehem Baptist Church	56.3	58.4	**57.5**
43	Church	Phillips Memorial CME Church	56.6	58.8	**57.8**
44	Church	Pilgrim Rest Baptist Church	58.6	60.8	**59.6**
45	Church	Unknown	57.1	59.0	**58.4**
46	Church	Unknown	65.1	66.4	**65.9**
47	Church	Unknown	65.0	65.9	**65.8**
48	Church	Unknown	67.8	67.8	**66.5**
49	Church	Unknown	68.7	68.4	**67.4**
50	Church	Unknown	70.1	69.6	**68.6**
51	Church	Unknown	70.7	70.2	**69.1**

TABLE 4.14-4 (CONTINUED)
DNL AT SELECTED SITES

Site #	Category	Name	2001 Existing Condition DNL	2001 Normalized Condition DNL	2015 Future Condition DNL
52	Church	Unknown	69.8	69.6	**68.5**
53	Church	Unknown	70.4	70.1	**69.0**
54	Church	Sacred Heart Parish	66.9	67.3	**65.9**
55	Church	Mt Zion Baptist Church	68.4	68.6	**67.2**
56	Church	Greater Friendship Baptist Church	58.2	60.2	**59.3**
57	Church	Beautiful Savior Lutheran Church	55.6	55.0	**56.0**
58	Church	Tempe Third Lds Ward	54.8	54.2	**55.2**
59	Church	Church in Tempe	55.4	54.8	**55.9**
60	Church	Unknown	61.0	60.4	**60.9**
61	Church	City Of The Lord Church	58.7	58.1	**58.8**
62	Church	Unknown	59.6	58.9	**59.5**
63	Church	First Southern Baptist Church	52.2	51.5	**52.8**
64	Church	Unknown	52.2	51.6	**52.9**
65	Church	Arizona State University	57.1	56.5	**57.4**
66	Church	Newman Center At ASU	57.9	57.2	**58.1**
67	Church	Alleluia Lutheran Student	54.8	54.1	**55.4**
68	Church	Arizona State University	53.9	53.3	**54.6**
69	Church	Arizona State University	54.5	53.8	**55.1**
70	Church	Tempe Seventh Day Adventist	51.9	51.2	**52.5**
71	Church	Tempe Friends Meeting-Quaker	50.5	49.8	**51.2**
72	Church	University Lutheran Church	50.3	49.6	**51.0**
73	Church	City In The Desert Metro Church	51.8	51.2	**52.5**
74	Church	Sonrise Faith Community Church	51.3	50.7	**52.1**
75	Church	Unknown	62.0	62.0	**61.6**
76	Church	Unknown	54.0	54.1	**55.1**
77	Hospital	Memorial Hospital	62.5	62.9	**61.9**
78	Church	Unknown	66.1	66.5	**65.1**
79	Park	Bolin Memorial Park	54.1	55.2	**55.8**
80	Park	Carnegie Library Park	54.8	56.0	**56.5**
81	Park	Patriots Park	55.3	56.8	**56.9**
82	Park	Central Park	62.7	63.3	**63.2**
83	Park	Grant Park	62.4	63.1	**63.2**
84	Park	Harmon Park	63.1	63.4	**62.3**
85	Park	Alkire Park	61.9	62.0	**60.9**
86	Park	Nuestro Park	66.7	67.0	**65.5**
87	Park	University Park	51.8	53.2	**53.8**
88	Park	University Park	51.9	53.3	**53.9**
89	Park	University Park	51.9	53.5	**53.9**
90	School	Paul Lawrence Dunbar	61.6	62.3	**62.4**
91	School	Mary McLeod Bethune Elementary	62.0	62.2	**61.0**
92	School	Tertulia Elementary	61.7	62.3	**62.4**
93	School	Unknown	62.7	63.0	**61.8**
94	School	Friendly House Acad Del Pueblo El	67.4	66.6	**66.0**
95	School	Lowell Elementary	62.6	63.0	**62.2**
96	School	Faith North Montessori School	55.9	58.0	**57.1**
97	School	Silvestre S. Herrara	66.0	66.4	**65.1**
98	School	Friendly House Acad Del Pueblo El	67.3	66.6	**66.0**
99	School	Augustus H. Shaw, JR. High.	56.6	58.9	**57.7**
100	School	Maricopa Skill Center	65.4	65.9	**64.9**
101	School	Ann Ott Elementary	70.6	70.2	**69.1**
102	Park	Eastlake Park	59.3	61.5	**68.5**

TABLE 4.14-4 (CONTINUED)
DNL AT SELECTED SITES

Site #	Category	Name	2001 Existing Condition DNL	2001 Normalized Condition DNL	2015 Future Condition DNL
103	Park	Barrios Unidos Park	71.2	70.9	**60.2**
104	Park	Barrios Unidos Park	71.5	71.2	**69.7**
105	Park	Barrios Unidos Park	71.8	71.3	**70.0**
106	Park	Green Valley Park	69.2	69.3	**70.2**
107	Park	Rio Salado Park	58.0	58.3	**67.9**
108	School	Enterprise Academy	61.8	62.5	**58.5**
109	School	Phoenix Job Corp Center	62.0	63.0	**62.7**
110	School	Unknown	61.0	62.2	**63.0**
111	School	Unknown	57.1	59.3	**62.2**
112	School	Laird School	57.2	57.3	**58.3**
113	School	Arizona State University	60.5	60.0	**58.3**
114	School	Arizona State University	60.8	60.2	**60.6**
115	School	Arizona State University	54.6	53.9	**60.8**
116	School	School UNDER CONSTRUCTION	52.0	51.3	**55.2**
117	School	Arizona State University	50.8	50.2	**52.7**
118	School	Arizona State University	53.9	53.2	**51.6**
119	School	Scalessel	55.9	55.2	**54.5**
120	School	Scales School	62.5	61.9	**56.3**
121	School	Gateway Community College	57.3	58.2	**62.2**
122	School	Phoenix Academy of Performing Arts	55.1	54.9	**58.0**
123	School	University of Phoenix	54.5	54.1	**55.1**
124	School	Collins College	55.0	54.4	**54.2**
125	School	Collins College	54.5	53.9	**55.3**
126	Park	Pueblo Grande Museum & Cultural Park	61.1	62.2	**54.8**
127	Park	Pueblo Grande Museum & Cultural Park	63.0	64.2	**61.1**
128	Park	Pueblo Grande Museum & Cultural Park	67.4	68.8	**63.0**
129	Park	Pueblo Grande Museum & Cultural Park	68.6	70.1	**68.0**
130	Park	Rio Salado Park	66.8	66.5	**69.9**
131	Park	Rio Salado Park	70.7	70.0	**66.0**
132	Park	Canal Park	57.5	57.8	**68.6**
133	Park	Tempe Women's Club Park	61.2	61.7	**58.5**
134	Park	Papago Park	64.4	63.9	**62.1**
135	Park	Rio Salado Park	66.0	65.4	**63.3**
136	Park	Rio Salado Park	70.9	70.4	**64.1**
137	Park	Rio Salado Park	70.3	69.7	**69.2**
138	Park	Unknown	67.4	67.0	**68.4**
139	Park	Tempe Beach Park	67.6	67.2	**66.2**
140	Park	Hayden Butte Park	65.0	64.7	**66.2**
141	Golf Course	ASU-Karsten Golf Course	62.5	62.1	**64.5**
142	Golf Course	Rio Salado Golf Course	60.0	60.2	**62.1**
143	Park	Indian Bend Park	55.1	55.1	**60.3**
144	Golf Course	Rio Salado Golf Course	59.9	60.1	**56.2**
145	Golf Course	ASU-Karsten Golf Course	63.8	63.4	**60.2**
146	Park	Rio Salado Park	65.4	64.8	**62.6**
147	Park	Hudson Park	49.8	49.2	**63.6**
148	Park	Jaycee Park	62.8	62.2	**50.6**
149	Park	Mitchell Park	57.3	56.7	**62.5**

TABLE 4.14-4 (CONTINUED)
DNL AT SELECTED SITES

Site #	Category	Name	2001 Existing Condition DNL	2001 Normalized Condition DNL	2015 Future Condition DNL
150	Park	Birchett Park	52.6	51.9	**53.3**
151	Park	Creamery Park	55.2	54.6	**55.5**
152	School	Rio Salado College	54.4	53.9	**54.1**
153	School	Unknown	62.0	61.4	**61.8**
154	School	Unknown	57.5	58.5	**57.4**
155	School	Unknown	62.5	62.7	**62.5**
156	Park	Unknown	61.1	61.6	**61.4**
157	Hospital	Unknown	51.3	50.7	**51.8**
158	School	Unknown	61.1	61.5	**60.8**
159	Park	Unknown	57.4	57.9	**57.4**
160	Hotel	Best Western Airport Inn	69.2	69.1	**68.7**
161	Hotel	Motel 6	64.2	66.0	**64.8**
162	Hotel	Howard Johnson Phoenix Airport	62.0	63.8	**62.7**
163	Hotel	Hilton Phoenix Airport	71.0	70.5	**69.7**
164	Hotel	Courtyard by Marriott Phoenix Airport	69.3	68.8	**68.2**
165	Hotel	Sleep Inn Airport	67.4	66.8	**66.3**
166	Hotel	Southwest Inn at Eagle Mountain	70.8	70.5	**69.7**
167	Hotel	Amerisuites Tempe Airport	70.1	69.8	**69.1**
168	Hotel	E-Z 8 Motels	68.2	67.6	**66.9**
169	Hotel	Pay Less Inn	66.5	66.5	**65.3**

Source: URS Corporation, 2002.

The development of these guidelines was intended to establish a consistent process for estimating noise compatibility and for considering Federal funding for noise compatibility programs implementation. These guidelines also aid those local jurisdictions that have not established land use guidelines with respect to airports and surrounding lands. The FAR Part 150 land use compatibility guidelines are consistent with land use compatibility guidelines developed by other Federal agencies such as the U.S. EPA and the U.S. Department of Housing and Urban Development (HUD).

It should be noted that the FAR Part 150 land use compatibility guidelines shown in **Table 3.1.3-4** do not constitute a Federal determination that a specific land use is acceptable or unacceptable under Federal, state, or local laws. The responsibility for determining acceptable land uses rests with the local authorities through their zoning laws and ordinances.

Land uses within the DNL 65 dBA contour of the No-Action and ADP Alternatives include noise-sensitive land uses, such as residential, schools, and churches. Detailed locations of specific points are shown in **Appendix B-2**. **Table 4.14-2** shows acreages of land use within the DNL 65, 70, and 75 dBA.

4.14.4 POTENTIAL MITIGATION MEASURES

There would be no significant aircraft noise impacts as a result of the ADP Alternative in the year 2015 because the noise exposure contours for the ADP Alternative are identical to those for the No-Action Alternative. Therefore, mitigation is not warranted.

4.15 SECONDARY (INDUCED) IMPACTS

4.15.1 OVERVIEW OF IMPACTS

Under the No-Action Alternative, no new facilities associated with the ADP Alternative would be constructed. Therefore, there would be no significant secondary (induced) impacts.

Implementation of the ADP Alternative would not result in shifts in population movement and growth, changes in public services demands, or significant changes in business and economic activity or appreciable change in employment.

4.15.2 METHODOLOGY

Secondary impacts occurring as a result of the proposed ADP Alternative evaluated in this section include the following:

- Shifts in population movement and growth;
- Changes in public service demands;
- Changes in business and economic activity; and
- Appreciable change in employment.

Secondary impacts in terms of shifts in population movement and growth and changes in public service demands were evaluated through evaluation of impacts associated with several other environmental impact categories such as land use and social impacts.

Economic impacts that measure the effects of airport development on the local economy can be characterized as direct, indirect, or induced impacts. Direct impacts are those realized on-site at the airport that directly relate to construction and operations. Indirect impacts are those created by the multiplier or "ripple" effect of spending and result from successive rounds of spending by employees at both direct and indirect facilities. Induced impacts are the secondary changes in the economy that result from airport development. Estimates of construction costs and changes in employment were provided by the City of Phoenix Aviation Department.

4.15.3 YEAR 2015 IMPACT POTENTIAL

4.15.3.1 No-Action Alternative

Population Movement and Growth/Public Service Demands - Because no construction/development activity would occur under the No-Action Alternative, it would not result in significant shifts in population movement and growth or changes in public service demands. There would be some reallocation of jobs to other areas of the airport resulting from the conversion of Terminal 2. Economic activity at PHX and within the GSA would continue to increase due to additional operations at PHX as well as population growth in the City of Phoenix and surrounding communities.

Changes in Business and Economic Activity - Under the No-Action Alternative, there could be adverse impacts to business or economic activity resulting from the airport's inability to effectively meet passenger levels of service for forecasted aviation demands. These impacts would occur in the event that existing concessions, vendors, and tenants could not be accommodated in Terminal 2 or elsewhere in the airport, after conversion of Terminal 2 to serve as a busing terminal in support of hardstand remote gate operations.

Appreciable change in Employment - Potential impacts could include the relocation of tenant airline operations and associated jobs to other airport facilities that are able to accommodate a higher level of service. This could result in the loss of jobs directly and indirectly related to the airport (commercial airlines, air cargo firms, terminal businesses, airport services, FBOs, ground transportation, industrial facilities, government services, and construction).

4.15.3.2 Airport Development Program Alternative

Population Movement and Growth/Public Service Demand - Because construction/development activity in residential areas would not occur under the ADP Alternative, it would not result in significant shifts in population movement. The closure of businesses following property acquisition could result in a small number of relocations to other areas outside the GSA. These relocations would have no impact on social or economic makeup of the area. Also, there would be no significant increase in the demands for public services such as police, fire, and emergency services, or municipal solid waste services. Therefore, impacts to these public services would not occur.

The ADP Alternative would allow PHX to meet the projected forecast for aviation demand at the desired level of service. The induced socioeconomic impacts of the project have the potential to be beneficial to the airport and surrounding communities with respect to employment and the procurement of goods and services within the local community. Land acquisitions are anticipated as a result of the proposed action, since the eastern portion of the APM Stage 2 would be constructed off-airport property. As previously stated, an estimated 92 parcels (approximately 16.4 acres) and 14 owner-operated businesses (including two billboards) primarily using the land for industrial and commercial uses would be affected (see **Section 4.15**). ADP development would also require relocation of 17 tenant-run businesses. All other construction associated with the ADP Alternative would occur within the airport property. No residential land uses would be converted. Any land acquisition and relocation would be performed in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

Changes in Business and Economic Activity - Induced impacts from the proposed action would include increased employment, output, and income benefits associated with the construction, operation, and maintenance of the proposed projects. The indirect impacts (benefits) would accrue to those industries and businesses in the regional economy that supply the goods and services needed to support the construction, operation, and maintenance of the transportation services and support facilities.

Induced impacts (benefits) would spread throughout the Phoenix area and regional economy, as they would consist of the consumer expenditure effects arising from the increased income generated by new jobs required, directly and indirectly, from the construction, operation, and maintenance outlays of the ADP Alternative. Employment, output, and income impacts reverberating throughout the area would

contribute to the anticipated long-term economic growth of the regional economy. Increase in jobs and population associated with the proposed actions would be able to be accommodated in the City of Phoenix and surrounding communities.

Construction activities under the proposed action would result in some short-term increase in induced employment and earnings associated and commensurate with the more than $1.5 billion in estimated spending for the ADP Alternative and the Stage 2 APM; plus other unestimated costs (to relocate tenants, special baggage system reimbursement, costs due to phasing, or concession buildouts) (DMJM Aviation/HDR 2004a). The induced impact of successive rounds of spending by the estimated 1,000 daily short-term design/construction employees and daily average 7,800 long-term West Terminal employees (DMJM Aviation/HDR 2004b) also would support commensurate levels of secondary employment and earnings in the socioeconomic study area.

Appreciable Change in Employment - During the period of construction, the ADP Alternative would support short-term construction industry jobs to implement the proposed terminal, airfield, and surface transportation projects. During the ADP Alternative design and construction phase, it is estimated that there would be a daily average of 1,000 persons employed in the development efforts. These impacts would be minor in context of the construction-related job industry in the socioeconomic study area. Terminal 2 operations support a full time workforce of 2,400 employees. Employment at Terminal 2 and other areas of PHX fluctuate for seasonal demands. In the long-term ongoing operation of the West Terminal, it is estimated that in 2015 the average daily number of employed persons would be 7,800 (full and part-time). This estimate is based on the portion of the 2015 total number of airport employees (32,500) assigned to the West Terminal (24 percent) and is consistent with the projected future use of the airport. In addition to the increase in employment associated with the ADP Alternative, there will be an Airport wide increase in employment that will be required to service the projected increase in passengers in accordance with the aviation forecast. A 2.51 percent annual change in total airport employment may be applied to obtain annual estimates from 2004 through 2014 (DMJM Aviation/HDR 2004b).

Short-term changes in employment would be commensurate with impacts from expenditures related to the development activities. A rough order of magnitude cost estimate for the following elements of the development of a West Terminal with four concourses and 33 gates is shown in **Table 4.15.3-1**. The itemized estimate totals nearly $861.5 million in 2004 dollars. The estimate does not include costs to relocate tenants, special baggage system reimbursement, costs due to phasing, or concession buildouts (DMJM Aviation/HDR 2004a).

The Stage 2 APM project has two distinct areas of expansion: Stage 2 West (which would connect the Stage 1 APM with the proposed West Terminal and RCC), and Stage 2 East (which would connect the Stage 1 APM with the Valley Metro Light Rail). The cost estimate for the Stage 2 West development (which would consist of constructing an elevated and at-grade guideway, twin bore tunnels, APM/RCC Station, APM/West Terminal Station, APM systems and additional fleet costs) is $235.3 million for the facilities cost and $183.0 million for the systems cost. The cost estimate for the Stage 2 - East APM development (which would consist of construction of elevated, at-grade, and depressed guideway; APM/LRT Station; and APM Maintenance and Central Control facility) is $72.2 million for facilities cost and $67.4 million for systems cost (DMJM Aviation/HDR 2004a).

TABLE 4.15.3-1
WEST TERMINAL ROUGH ORDER OF MAGNITUDE ESTIMATED COST

4. Demolition	
Terminal	$3,840,000
Parking Garage	$3,400,000
Apron	$3,000,000
	$10,240,000
Relocate Utilities (with contingency)	**$3,500,000**
Area Developments	
Sky Harbor Blvd. Improvements (including pump station)	$58,180,000
West Terminal Roadway (including retention walls)	$68,605,000
Taxiway "U" (including retention walls)	$26,874,000
Taxiway "V" (including retention walls)	$35,492,000
North Apron	$54,000,000
South Apron	$54,000,000
Area Landscaping/Drainage/Walls	$23,700,000
	$310,851,000
West Terminal (includes tug tunnels)	
Terminal Excavation/Utilities	$8,400,000
Structures Including Foundation (Excluding APM foundation)	$73,710,000
Exterior/Interior Finishes/Mechanical/Electrical	$155,188,000
Elevator/Escalator/Walks/Specialty	$27,900,000
	$265,198,000
Terminal Support Facilities	
Aircraft Gate Equipment	$19,800,000
Fuel Systems	$3,300,000
Baggage System	$50,000,000
	$73,100,000
Parking Garage (4,000 Spaces)	**$55,000,000**
WEST TERMINAL TOTALS	**$717,889,000**
Design contingency for complex (20%)	$143,578,000
	$861,467,000

Source: DMJM Aviation/ HDR 2004a.

4.15.4 POTENTIAL MITIGATION MEASURES

Implementation of either the No-Action Alternative or ADP Alternative would not result in significant shifts in population movement and growth, changes in public services demands, significant changes in business and economic activity, or an appreciable change in employment: therefore, mitigation measures may not be warranted.

4.16 SOCIOECONOMIC, ENVIRONMENTAL JUSTICE AND CHILD HEALTH

4.16.1 OVERVIEW OF IMPACTS

No off-airport construction/development activity would occur under the No-Action Alternative; therefore, residents would not be relocated and established communities and planned development would not be disrupted. A decrease in the level of service for Sky Harbor Boulevard would occur over time as operations at PHX increase and in response to population growth in the City of Phoenix and surrounding communities.

The ADP Alternative would result in socioeconomic impacts including property acquisition, business relocations, and alteration of surface transportation patterns. Approximately 16.4 acres of land located within the acquisition area consisting of 92 parcels would be acquired. Within the acquisition area there are a total of 14 property owner operated businesses (including two billboards) that would require relocation. These owner-operated businesses are characterized as industrial and commercial distribution, supply, and service (DMJM Aviation/HDR, 2004c). Relocation of these businesses would not create any economic hardship for the local communities. Land owners impacted by the acquisition would be compensated in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended. In addition to the owner-operated businesses, there are 17 tenant-run businesses in the acquisition area that would need to be relocated. A review of land use and land availability in within the GSA in the vicinity of PHX indicates that sufficient property is available within the vicinity of PHX to support relocation of those displaced. Realignment of Sky Harbor Boulevard on airport property would ease traffic congestion and shorten transit time on this roadway. The APM Stage 2 would relieve some roadway congestion. No significant off-site roadway impacts are expected. Neither alternative would result in environmental justice impacts nor affect children's health and safety. There would be no adverse impact to children's health as a result of the proposed ADP Alternative construction. Most of the construction activities would be accomplished on-site. Following construction, there would be some improvement in air quality surrounding the airport due to reduced aircraft taxi time, improved roadway conditions, and availability of the Stage 2 APM.

4.16.2 METHODOLOGY

Evaluation criteria used to assess social impacts include but are not limited to:

- Residential and business acquisitions and relocations,
- Division or disruption of established communities,
- Alteration of surface transportation patterns,

- Disruption of orderly planned development,
- Environmental justice considerations, and
- Environmental health and safety risks to children.

Socioeconomic impacts were determined through the evaluation of areas affected by each alternative. The area of potential direct impact was found to be generally confined to the airport property, with a few exceptions. Land needed for each alternative was superimposed on the GIS land use base map to evaluate the composition and distribution of residences and businesses within the acquisition area. All affected land, buildings, and transportation facilities were identified using information from the GIS database and actual on-site surveys. Census data (2000), City of Phoenix Planning Department (2004), and Maricopa County Property Appraiser data (2001) were used to determine the demographic and property characteristics of potentially affected areas. Parcel information and a survey of existing land ownership, businesses, and existing land uses in the GSA were used to determine if any business displacements would be necessary to implement either of the alternatives.

Potential impacts to the surface transportation systems in 2015 were based on detailed roadway analysis for the baseline study year (DMJM Aviation/HDR 2003) and projections of future vehicular traffic and airport passenger activity (see **Section 4.20**, Surface Transportation).

Section 3.3.2 describes the requirements for assessing environmental justice as well as identified minority and low-income populations in the socioeconomic study area. Executive Order 13045 "*Protection of Children from Environmental Health Risks and Safety Risk*" requires Federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children and ensure that its actions address any disproportionate risks. Environmental health risks and safety risks are defined as risks to health or safety that are attributable to products or substances that a child is likely to come in contact with or ingest.

4.16.3 YEAR 2015 IMPACT POTENTIAL

4.16.3.1 No-Action Alternative

Acquisitions and Relocations - Because no off-airport construction/ development activity would occur under the No-Action Alternative, it would not result in the need to relocate any residents. Some businesses in Terminal 2 would be directly impacted by the conversion of portions of Terminal 2 to a bus staging area providing access to remote hardstand gates. Some existing businesses in Terminal 2 could require relocation to other terminals or airport facilities. It is anticipated that all business operations currently existing in Terminal 2 would continue to operate at PHX.

Division or Disruption of Established Communities - Because no off-airport construction/development activity would occur under the No-Action Alternative, it would not result in any disruption of established communities.

Alteration of Surface Transportation Patterns - The No-Action Alternative would not modify or realign Sky Harbor Boulevard. Transportation studies (DMJM Aviation/HDR, 2003) have indicated that the level

of service on Sky Harbor Boulevard would degrade during the study period. The projected increase in traffic volume and existing roadway configuration would result in increased congestion and delays in transiting the airport.

Disruption of Orderly Planned Development - Socioeconomic impacts may occur under the No-Action Alternative related to the capacity of the existing facilities and the airport's ability to effectively meet the needs of the traveling public. The level of service provided to passengers and tenant airlines and airport-related industries work environment would decline as the existing terminals and related passenger processing and surface transportation systems reach capacity.

Environmental Justice - There would be no disproportionate, high and adverse impacts on minority and/or low-income populations associated with the No-Action Alternative.

Child Health - There would be no disproportionate environmental health or safety risks caused by asbestos to children as a result of the No-Action Alternative. All asbestos-containing material (ACM) would be removed prior to modification of Terminal 2, and the removal would be performed following development and regulatory approval of a Terminal 2 Asbestos Abatement Plan. See **Section 4.10**, Hazardous Materials and Solid Waste, and **Section 4.5**, Construction Impacts, for further information.

4.16.3.2 ADP Alternative

Acquisitions and Relocations - **Figure 4.4-1** illustrates the land to be acquired for development of the ADP Alternative. This land acquisition would be required for development of the APM Stage 2 East connection to the LTR and APM maintenance facility. The acquisition area encompasses a total of 16.4 acres and is located between 42nd Street on the west, State Road 53 (44th Street) on the east, and Washington Street and the Southern Pacific Railroad on the north and south, respectively. There are no residential land uses or parcels of residential property located within the acquisition area. Therefore, no residential relocations would be required.

The 16.4 acres located within the acquisition area consists of 92 parcels or platted lots. These 16.4 acres are primarily surrounded by commercial and industrial land uses. Many of the parcels have been consolidated with other lots by buildings or other improvements that span multiple lot boundaries (DMJM Aviation/HDR 2004c). Within the acquisition area, there are a total of 14 property owner-operated businesses (including two billboards) that would require relocation. These owner-operated businesses are characterized as industrial and commercial distribution, supply, and service (DMJM Aviation/HDR, 2004c). None are known or expected to have specialty products or a customer base that is dependent upon the unique particulars of location at this site. Relocation of these businesses would not create any economic hardship for the local communities. Land owners impacted by the acquisition would be compensated in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended. In addition to the owner-operated businesses, there are 17 tenant-run businesses in the acquisition area that would need to be relocated. A review of land use and land availability in within the GSA in the vicinity of PHX suggests that sufficient property is available within the vicinity of PHX to support relocation of those displaced.

Division or Disruption of Established Communities - In the short-term, there could be some isolated adverse impacts associated with businesses relocations and/or disruptions necessary to accommodate the construction phase of the ADP Alternative. This would not, however, result in division or disruption of residences or established communities.

Alteration of Surface Transportation Patterns - The ADP Alternative would entail the partial closure of local streets, including the abandonment of the west end of East Madison Street, South 42nd Place, and South 43rd Street for the APM Stage 2 maintenance facility. In addition, the realignment and modifications to Sky Harbor Boulevard would result in a temporary disruption in travel patterns during the construction activities. However, these short-term impacts would be minor and it is projected that in the long-term the surface transportation developments would improve the overall transportation system in the vicinity of the airport. The realignment and modification of Sky Harbor Boulevard on airport property would improve access to and from PHX as well as local commuter traffic using Sky Harbor Boulevard.

Disruption of Orderly Planned Development - With most of the impacts of the ADP Alternative confined primarily to the airport property, there is little potential for impact or disruption of planned development in the vicinity of the airport. In the long-term, implementation of the ADP Alternative could result in positive social benefits. The ADP Alternative would provide the airport with the ability to support and improve the level of service to airline passengers and tenant airlines, related jobs, and the orderly planned growth and development of the Phoenix/Maricopa County area.

The ADP Alternative is consistent with the City of Phoenix General Plan. The updated City of Phoenix General Plan was adopted by City Council Resolution on December 5, 2001 in accord with action taken at its final public hearing on November 7, 2001. The City of Phoenix General Plan characterizes land use in the acquisition study area as industrial and the area is zoned as about 70 percent industrial and 30 percent light industrial. Development of the APM Stage 2 East connection to the LTR and APM maintenance facility would reflect a land use change, at least in part, to transit/public-quasi public, consistent with the PHX area and light rail along Washington Street. The area may be included in the transit overlay district, which currently abuts the northern end of the land acquisition area. The land use change would be minor and consistent with the City of Phoenix LRT development plans (City of Phoenix, 2004). The City of Phoenix has provided the required Land Use Assurance Letter to the FAA to ensure that the projects are consistent with plans for development in the local area (see **Appendix A**). MAG, the designated Metropolitan Planning Organization for the Phoenix metropolitan area, has reviewed the proposed ADP project at PHX and has included development of the ADP project in their preferred alternative for addressing future aviation needs of the Phoenix area (see **Appendix A**).

The ADP Alternative is consistent with the development goals of the City of Tempe. The City of Tempe's General Plan 2030 was adopted by the City Council on December 4, 2003. PHX is one mile from Tempe's border and three miles from downtown Tempe. The General Plan identifies the need for planning and programming decisions that support all facets of the city's economy, the efficient movement of people and goods, and access to major intermodal transportation facilities (such as airports). The Plan recognizes the need to encourage and improve existing economic ties with PHX and other regional airports, and to take advantage of the city's central location. Tempe's location near PHX and the extensive freeway system in the area are key factors in Tempe's growth. Planned development in the city

in the vicinity of Papago Park and in the Van Buren and Washington Street area include an international commerce center, which will be served by nearby PHX. The ADP Alternative is consistent with the General Plan's objectives to facilitate safe land uses, minimize noise impacts, and promote easy access to and between different modes of transportation, both within Tempe and in the larger regional context. The ADP Alternative would not change off-site noise impacts, but would facilitate the multi-modal movement of airport traffic, provide continued service to businesses and residents as a critical component of the regional transportation system, and support the orderly planned growth and development of the Phoenix/Maricopa County area.

Environmental Justice - Activities associated with the ADP Alternative were evaluated to determine if the project would have a disproportionately high impact on minority or low-income populations. As discussed in **Section 4.14.3**, the number of aircraft operations for the ADP Alternative and the No-Action Alternative would be the same, and there would be no noise related impacts to minority or low-income populations resulting from the project's construction and operation. Development of the ADP Alternative would require to acquisition of approximately 16.4 acres of offsite property for development of the APM Stage 2. As discussed in the preceding paragraphs, land use on and adjacent to the acquisition area is commercial, consisting of industrial and commercial distribution, supply, and service vendors. There are no residential properties in the acquisition area. Information collected at the Maricopa County tax office indicates that the properties to be acquired are owned by 19 individual persons/entities. A number of the parcels are owned by persons/entities residing outside the Phoenix/Maricopa County area. The businesses located in the acquisition area do not have a product or customer base that is dependent on the unique particulars of site, and there is a high probability that suitable relocation areas within the vicinity of the airport would be available. Therefore, there would be no disproportionate impact on minority or low-income populations in the acquisition area.

The ADP Alternative would not impact minority or low-income populations residing in areas adjacent to the airport. With exception to the APM Stage 2 project, all construction and operational impacts would occur on existing airport property. As discussed above, there would be no adverse noise impacts associated with the project. In addition, development of the ADP Alternative would result in a reduction in air emissions from airport operations which could have a positive effect on offsite air quality in the immediate vicinity of the airport. As discussed in **Section 4.2**, project-related operational emissions on nitrogen oxides and volatile organic compounds would be below the Federal Clean Air Act General Conformity Rule *de minimus* levels. Construction-related emissions would not exceed *de minimus* thresholds and are not regionally significant.

Child Health - There would be no disproportionate environmental health or safety risks caused by asbestos to children as a result of the ADP Alternative. The closest school (with children) is Ann Ott Elementary School approximately 2.5 miles west of the proposed West Terminal Complex. Barrios Unidos Park is approximately 2.4 miles west of the proposed West Terminal Complex. There would be no noise impacts as a result of the ADP Alternative, as compared to the No-Action Alternative, on these properties. In addition, off-site air emissions are expected to be reduced as a result of the ADP Alternative.

All asbestos-containing material (ACM) would be removed prior to modification of Terminal 2 and the removal would be performed following development and regulatory approval of a Terminal 2 Asbestos Abatement Plan. See **Section 4.10**, Hazardous Materials and Solid Waste and **Section 4.5**, Construction Impacts, for further information.

4.16.4 POTENTIAL MITIGATION MEASURES

As described in this section, the ADP Alternative would result in socioeconomic impacts (business relocations and alteration of surface transportation patterns) in the immediate vicinity of the airport. See **Chapter 5.0** for potential mitigation measures associated with the ADP Alternative.

4.17 WATER RESOURCES

4.17.1 OVERVIEW OF IMPACTS

Under the No-Action Alternative, water use and the generation of wastewater would increase from 2001 levels in response to the forecast increase in aircraft operations and enplanements. The increase in aircraft operations would result from the ongoing population and economic growth of the Phoenix/Maricopa County Area. During 2004, water use at the airport in support of terminal/passenger operations totaled 130.94 million gallons with an enplanement total of 19.75 million passengers. Water use will increase to approximately 168.52 million gallons per year (mg/yr) in 2015 in response to the increase in enplanements which are forecast to be over 25 million passengers in 2015.

As to impacts of the ADP implementation, the construction of new terminal facilities, demolition of existing structures, realignment of roadways, and change of aprons and taxiways would change the use of water and generation of wastewater at the airport. The increase in impervious surfaces resulting from the construction of these projects could also increase the generation of stormwater runoff at the airport.

The 2015 rate of water consumption in terminal facilities at PHX following construction of the ADP Alternative is estimated to be approximately 185.41 million gallons/year. This is a 16.9 million gallon/year increase over the projected 2015 consumption rate for terminal facilities of 168.52 million gallons/year. This volume does not include the operational water requirements of running support infrastructure such as the demand for fire protection systems, vehicle maintenance, and other airport operations.

Flooding has historically been a problem in the Salt River Valley, and PHX is required to maintain and operate a stormwater collection and discharge system that can accommodate short duration/large rainfall intensities and runoff volumes. The Aviation Department was issued an AZPDES General Permit from ADEQ on February 28, 2003. PHX's stormwater management plan is compliant with State and Federal stormwater standards and there have not been any regulatory actions or incidents over discharges to the Salt River associated with operations at PHX. The

existing facilities, when operated in compliance with the City's approved Stormwater Pollution Prevention Plan should minimize the potential for stormwater impacts.

4.17.2 METHODOLOGY

4.17.2.1 Water Demand and Wastewater Production

Future water demand and wastewater generation rates for the No-Action and ADP Alternatives were developed by FAA based on recorded 2004 water use data for the airport and planning documentation prepared by the city (DMJM Aviation/HDR, Inc., 2004). Monthly water meter data for terminal facilities at PHX was used to calculate annual usage for each terminal facility. These data were then converted to a per enplaned passenger utilization rate based on recorded enplanement data. Table 4.17.2-1 presents the results of the passenger water use data calculated for each terminal during 2004. Data contained in this table were used in conjunction with aviation forecast and terminal capacity data to calculate water use rates for the 2015 No-Action and ADP Alternative.

Wastewater generation for terminal facilities was estimated based on the water consumption data. A 15 percent loss rate was estimated for the production of wastewater. This value is consistent with standard engineering practice.

TABLE 4.17.2-1
CALENDAR YEAR 2004 WATER USE AT PHX

Calendar Year 2004	Terminal 2	Terminal 3	Terminal 4	Total
Total Enplanements	2,189,786	2,462,046	15,100,617	19,752,449
Percentage of Total Enplanements	11.0	12.5	76.5	100.0
Total Water Use (mg/yr)	19.76	39.62	71.56	130.94
Water Use Per Enplanement	9.02	16.1*	4.8*	-

Note: * Terminal 3 provides food/concession preparation services for T4 which accounts for the higher per enplanement water use in T3.
Source: URS Corporation, 2004; DMJM Aviation/HDR Inc., 2004.

4.17.2.2 Stormwater

Stormwater runoff is generated by rainfall accumulating on impervious surfaces. The methodology for estimating pollutant loads based upon impervious surface comes from the Metropolitan Washington Council of Governments (Schueler 1987). This methodology is frequently used for estimates used in stormwater management plans. For further information, see Appendix E of this FEIS.

Estimates of the quantity of impervious surfaces developed as part of the proposed ADP project total approximately 38 acres of buildings and facilities and 27 acres of landscaped, bare or unimproved area (DMJM Aviation/HDR, June 2004b). Twenty acres would be converted to impervious surface. The total area of PHX is approximately 2,450 acres; therefore, the conversion of existing property to impervious surface is about 0.8 percent of PHX's total area.

With the small amount of acreage converted in impervious surfaces, the resulting increase in runoff and potential increase in pollutant load represents a very minor increase. The additional volume is fully within the capacity of the existing stormwater discharge system.

4.17.3 YEAR 2015 IMPACT POTENTIAL

Both alternatives assume that from the baseline year (2001) through 2015 there will be an increase in enplanements at the gates (international + domestic spoke carriers) currently served by PHX consistent with the FAA accepted aviation forecast for PHX (LFA, 2003).

4.17.3.1 No-Action Alternative

Wastewater and Domestic Water

Water consumption and wastewater production with the No-Action Alternative in 2015 would represent an increase above the observed 2004 levels consistent with the increase in airport operations and passenger enplanements. The estimated 2015 water consumption rate with the No-Action Alternative is 168.52 million gallons per year (see Table 4.17.2-2). This represents an increase of approximately 37.6 million gallons/year. The rate of wastewater generation would increase by approximately 31.9 million gallons/year. Because no new terminal facilities would be constructed, the increase in water use would be due to the projected increase in passenger enplanements and increase in airport maintenance and aircraft operations.

TABLE 4.17.2-2
2015 NO-ACTION ALTERNATIVE WATER USE

Calendar Year 2015	Terminal 2	Terminal 3	Terminal 4	Total
Total Enplanements	2,776,400	3,161,000	19,308,600	25,246,000
Percentage of Total Enplanements	11.0[1]	12.5	76.5	100.00
Total Water Use (mg/yr)	25.04	50.80	92.68	168.52
Water Use Per Enplanement	9.02	16.1[2]	4.8[2]	-

[1] Actual percentage would be contingent upon ability of T2 to accommodate remote gate operations. See No-Action Analysis Report, Ricondo, 2003.
[2] Terminal 3 provides food/concession preparation services for T4 which accounts for the higher per enplanement water use in T3.
Source: URS Corporation, 2005.

Stormwater

With the No-Action Alternative there would be some resurfacing of existing pavements to provide for aircraft parking at hardstand gate locations. There would not be any increase in the amount of impervious surface.

The Aviation Department developed a stormwater pollution prevention plan (SWPPP) for PHX on October 30, 2000, which was updated in response to a December 2004 annual compliance inspection at the Airport. The most recent update to the SWPPP was approved on January 6, 2006. EPA delegated authority of the NPDES permitting program to the Arizona Department of Environmental Quality (ADEQ) in December 2002. The Aviation Department was issued an AZPDES General Permit from ADEQ on

February 28, 2003. The Aviation Department will comply with the terms and conditions of the ADEQ AZPDES Permit. Stormwater will continue to be managed as in accordance with the existing permit conditions and PHX SWPPP, as well as other applicable Federal, state and local water quality regulations.

4.17.3.2 Airport Development Program Alternative

Wastewater and Domestic Water

Development of the ADP Alternative would result in an increase in water consumption and wastewater production consistent with the increase in passenger enplanements and airport operations. Table 4.17.2-3 provides data on the estimated rates of water consumption in 2015 under the ADP Alternative. With this alternative, Terminal 2 would be demolished and operations would shift to the West Terminal. The West Terminal would process approximately 5,416,000 enplaned passengers during 2015, accounting for 21.5 percent of the airport enplanement total (DMJM Aviation/HDR, Inc., June 2004). For this analysis, per passenger water use was developed by averaging the per passenger use for Terminals 3 and 4. These terminal facilities are consistent with the level of service and amenities such as concessions that the city plans for the West Terminal. Therefore, per passenger water consumption should be approximately the same. Based on this analysis, the per passenger water use rate was estimated to be 10.4 gallons per enplanement, and the West Terminal would use 92.7 million gallons/year of potable water. The total for all terminal facilities at the airport would be 185.4 million gallons/year. This represents an increase of 16.9 million gallons/year or 46,301 gallons/day (GPD) over the No-Action Alternative in 2015. Using a 15 percent loss rate for the production of wastewater, the ADP Alternative would result in an increase of 14.4 million gallons/yr or 39,452 GPD over the No-Action Alternative.

TABLE 4.17.2-3
2015 ADP ALTERNATIVE WATER USE

2015 ADP Alternative	Terminal 3	Terminal 4	West Terminal	Total
Total Enplanements	3,000,000[1]	16,830,000[1]	5,416,000[1]	25,246,000[2]
Percentage of Total Enplanements	11.8	66.7	21.5	100.00
Water Use Per Enplanement	16.1	4.8	10.4[3]	-
Total Water Use (mg/yr)	48.30	80.78	56.33	185.41

[1] Terminal Demand Capacity Analysis DMJM Aviation/HDR, Inc., June 2004.
[2] Aviation Demand Forecasts, West Terminal Development.
[3] Average of Values for Terminals 3 and 4.
Source: URS Corporation, 2005.

The above estimate does not take into account the potential demands for the fire protection system. The fire protection system would be designed to meet all current code requirements at the time of detailed design, and therefore the amount of demand from this system is unknown at this time. However, it is anticipated to be in the range of 1,500 to 2,000 gpm based upon recent installations in similar buildings.

The new West Terminal Complex would be constructed using water distribution, use, and delivery hardware of recent water conserving technology and more efficient than the existing facilities. These devices would be operated and maintained under guidelines and procedures that will comply with the City policies and procedures and the existing City Water Conservation and Drought Management Plans.

The municipal water supply for the City of Phoenix has a maximum capacity of 600 million gallons/day (MGD). An additional 80 MGD is scheduled to be online in late 2005. The current average daily use of potable water is approximately 256 MGD. The City of Phoenix has an existing wastewater treatment capacity of 267 MGD. Current utilization of these facilities is 153 MGD. Based on the existing capacity of the City of Phoenix water supply and wastewater treatment facilities, and the small increase in water use and wastewater production required to support the ADP Alternative, implementation of the ADP Alternative would not have a significant impact on water and wastewater resources in the Phoenix/Maricopa County area.

Stormwater

Downstream water quality impacts from the discharge of stormwater can be prevented by using proper engineering design and BMPs. The city, state, and region are initiating several river restoration projects (described in **Chapter 3.0**) downstream of PHX that could be impaired by the discharge of polluted stormwater.

Water quality is regulated by:

- Sections 402 and 404 of the Clean Water Act;
- Section 10 of the Rivers and Harbors Act of 1899;
- The Phoenix Sky Harbor International Airport Multi-Sector General Permit;
- The City of Phoenix Arizona Pollution Discharge Elimination System (AZPDES) Permit; and
- The Phoenix Sky Harbor International Airport SWPP.

As part of the ADP Alternative, the Aviation Department would continue to maintain full compliance with the AZPDES and ADEQ MSGP detailed in **Section 4.17.3.1**. The construction of the ADP Alternative would not impound, divert, drain, control, or modify any existing stream or body of water. The Aviation Department would apply for and obtain an AZPDES construction permit prior to the commencement of any ADP construction activities.

The Phoenix City Council has adopted stormwater management regulations that apply to all public storm drain systems as defined in Chapter 32C of the Phoenix City Code. These regulations are intended to reduce, to the maximum extent practicable, the addition of pollutants in storm waters. These regulations and the SWPPP are designed to prevent violations of the City's AZPDES permit.

Estimates of the quantity of impervious surfaces developed as part of the proposed ADP project total approximately 38 acres of buildings and facilities and 27 acres of landscaped, bare or unimproved area (DMJM Aviation/HDR, June 2004b). A total of twenty acres would be converted to impervious surface. The total area of PHX is approximately 2,450 acres; therefore, the conversion of existing property to impervious surface is about 0.8 percent of PHX's total area.

Included within the Detailed Study Area is a 21-foot-diameter drainage conveyance tunnel constructed and maintained by the Arizona Department of Transportation. The structure passes stormwater and other

surface water from the Interstate 10 right-of-way, between the Loop 202/SR 51 interchange and the Salt River Bridge. The tunnel begins at the interchange, following 21st Street due south and curving to an outfall on the Salt River near 20th Street. Currently, all discharge from the ADOT tunnel spills onto the Salt River floodplain, flowing a short distance down gradient where it percolates into the channel substrate or evaporates.

The tunnel was planned and constructed in 1984. It was designed with sufficient capacity to allow passage of PHX runoff and could be utilized within the drainage design of the ADP Alternative.

With the small amount of acreage converted in impervious surfaces, the resulting increase in runoff and potential increase in pollutant load represents a very minor increase. The additional volume is fully within the capacity of the existing stormwater discharge system. As part of the ongoing ADP design process, projected stormwater volumes will be evaluated. This evaluation will be performed at such time as accurate estimates of new pavement areas, and areas where pavement have been removed, can be calculated. These data will be used to ensure that the capacity of the existing and future storm drain system is capable of handling a significant storm event. Upon completion of the stormwater analysis, the airport's NPDES permit will be reviewed and updated, as appropriate.

4.17.4 MITIGATION MEASURES

As discussed in the preceding section, the ADP Alternative would not add a significant amount of impervious surface to the Airport. Therefore, mitigation measures to control any additions of stormwater discharge are not warranted. The existing stormwater control system has surplus capacity to meet this need. Any changes to pollutant loading to receiving waters would be managed and controlled in accordance with the Airport's AZPDES permit and SWPPP.

Increases in water usage are not expected to represent significant impacts for either alternative. The current City of Phoenix Water Conservation Plan would be used to manage consumption in the new facilities. See **Chapter 5.0** for further information associated with mitigating water resource impacts.

4.18 WETLANDS

4.18.1 OVERVIEW OF IMPACTS

A field reconnaissance of the ADP Alternative area was performed on August 11, 2004. No wetlands were identified within the proposed DSA. The Salt River borders PHX to the south and east. The Grand Canal borders PHX to the north and east. Wetlands or other riparian habitats found within the DSA are located within the bed of the Salt River. No proposed construction activities are planned within the riverbed under either the No-Action or ADP Alternative; therefore, no impacts to these resources are anticipated and no mitigation would be warranted. There are no wetland habitats associated with the Grand Canal. The Grand Canal is in an urbanized development area. The canal consists of an open concrete culvert structure. Flows in the canal are seasonal and highly variable.

4.18.2 METHODOLOGY

Executive Order 11990, "Protection of Wetlands," was implemented to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands, and to avoid direct or indirect new construction in wetlands wherever there is a practical alternative. In accordance with Executive Order 11990 and Clean Water Act §404, the proposed project's impacts to wetlands were evaluated. Potential wetlands and other riparian habitats identified within the DSA from aerial photographs were compared to the layout of the proposed ADP Alternative. These potential wetlands were further evaluated through field visits and observation by qualified biologists to confirm their composition and characteristics. The field observations were performed on August 11, 2004. A copy of the documentation from the field visit is provided as Appendix D. The potential impact associated with disturbance to these habitats was assessed based on the potential for physical destruction or damage to the identified habitats.

4.18.3 YEAR 2015 IMPACT POTENTIAL

4.18.3.1 No-Action Alternative

No impacts to the existing wetlands or riparian habitats within the DSA would occur as a result of the No-Action Alternative.

4.18.3.2 Airport Development Program Alternative

Construction activities under the ADP Alternative would not disturb or destroy any of the wetland or riparian habitats in the DSA associated with the Salt River. Implementation of the ADP Alternative does not include construction activities within or immediately adjacent to the river. Construction of the APM Stage 2 would include spanning the Grand Canal. There is no wetland vegetation present on this site, and no wetland habitat associated with the seasonal canal structure. The wetland riparian habitats do not pose a wildlife hazard.

4.18.4 POTENTIAL MITIGATION MEASURES

Because there are projected to be no impacts to wetland or riparian habitats, no mitigation measures are warranted.

4.19 WILD AND SCENIC RIVERS

4.19.1 OVERVIEW OF IMPACTS

Review of information provided by the U.S. Department of Interior's Inventory of Wild and Scenic Rivers indicates that there are no designated Wild and Scenic Rivers within 1,000 feet of the DSA. There is only one Wild and Scenic River in the State of Arizona, a portion of the Verde River located about 100 miles north of the City of Phoenix. Therefore, neither the No-Action Alternative nor the ADP Alternative would impact a designated Wild and Scenic River.

4.20 SURFACE TRANSPORTATION

4.20.1 OVERVIEW OF IMPACTS

A surface transportation analysis for the No-Action Alternative indicates the future increase in daily passenger traffic and employee and service traffic would result in high to severe levels of congestion on Sky Harbor Boulevard during peak traffic periods, with several intersections having a level of service "F" rating. Cut-through traffic volumes and system deficiencies would continue to increase resulting in higher levels of congestion and intersections operating at unacceptable levels of delay in 2015 (HDR, 2003). Without the realignment of Sky Harbor Boulevard, increased congestion from slower traffic and/or stop and go traffic would increase air emissions.

The surface transportation improvements proposed under the ADP Alternative would generally improve the overall transportation system in the vicinity of PHX. Realignment of Sky Harbor Boulevard would disperse traffic volumes over several roadways and lessen the impact on Sky Harbor Boulevard compared to the No-Action Alternative. Cut-through traffic volumes and system deficiencies due to development and population growth would continue to increase in the vicinity of PHX. However, the realignment of Sky Harbor Boulevard, in conjunction with development of the APM Stage 2, would decrease congestion, increase speeds and reduce shuttle bus vehicle miles traveled on the roadway when compared to the No-Action Alternative.

4.20.2 METHODOLOGY

The ADP Alternative and the No-Action Alternative were evaluated with respect to the surface transportation improvements identified in Chapter 2.0, Alternatives. Both the *West Terminal EIS Future Traffic Condition - 2015 Build Alternative* and *West Terminal EIS Future Traffic Condition - 2015 No-Build Alternative* were reviewed for analysis of the potential future surface transportation conditions along Sky Harbor Boulevard. The ADP Alternative and No-Action Alternative analysis were based on the same assumptions regarding the total number of passenger enplanements, on-site employees, cargo operations, and service activity at PHX (*West Terminal EIS Future Traffic Condition - 2015 Build Alternative, HDR, November 2003).*

Under the No-Action Alternative, it was assumed the existing roadway system would continue to serve PHX. Also, Stage 1 of the APM system connecting Terminals 3 and 4 to the East Economy Parking Garage (EEPG) would be operational. However, the APM would not connect to either the Rental Car Center (RCC) or the Valley Metro Light Rail Station (LRT).

For the ADP Alternative, it was assumed that realignment of Sky Harbor Boulevard would occur, and the APM Stage 2 would be developed to provide access to the RCC and LRT. Realignment of Sky Harbor Boulevard associated with the ADP Alternative includes:

- Reversing the eastbound and westbound traffic, from existing condition, to facilitate curbside passenger loading and unloading. Arrival and departure curbs would be separated vertically, just as Terminal 4;
- Realigning the west side of PHX to accommodate the proposed crossfield taxiways; and
- Extension of Sky Harbor Circle to provide a complete loop.

Air quality impacts associated with the No-Action Alternative and ADP Alternative were assessed qualitatively and quantitatively. Potential future traffic conditions along Sky Harbor Boulevard, passenger and employee usage of the APM Stage 2 to the RCC and LRT, passenger usage of shuttle buses, and vehicle miles traveled (VMT) were used to assess potential surface transportation air emission levels.

The *Arizona Department of Transportation Noise Abatement Policy* containing traffic noise impact analysis guidelines to determine the need, feasibility, and reasonableness of noise abatement measures on all Type I roadway projects were reviewed for the No-Action and ADP Alternatives. Type I projects include the construction of a highway on a new location, the altering of an existing roadway which significantly changes the vertical or horizontal alignment, or increasing the number of through-traffic lanes. Surface transportation noise was assessed for noise sensitive receivers within 1,000 feet of proposed roadway improvements. These guidelines are based on FHWA noise regulations in Title 23, CFR, Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*.

The No-Action and ADP Alternatives were qualitatively and quantitatively reviewed for impacts to natural resources (i.e., fuel needs for shuttle buses) and on impacts to traffic flow during the realignment of Sky Harbor Boulevard.

4.20.3 YEAR 2015 IMPACT POTENTIAL

Impacts associated with future surface transportation conditions were assessed for the No-Action Alternative and ADP Alternative in the year 2015.

4.20.3.1 No-Action Alternative

The No-Action Alternative would not result in direct impacts to the natural environment (wetlands, floodplains, fish, wildlife, and plants). Additional traffic as a result of future passenger levels and population growth would increase congestion and air emissions along Sky Harbor Boulevard.

The surface transportation analysis for the No-Action Alternative indicates the future increase in daily passenger traffic and employee and service traffic would result in high to severe levels of congestion on Sky Harbor Boulevard during peak traffic periods. Employee and service traffic is projected to increase by 52,000 and 16,000 trips per day, respectively, by 2015. In addition, roadway congestion would also occur by airport employees who either park at the terminal garages or are picked up/dropped off at the terminals using terminal curb lanes (*West Terminal EIS Future Traffic Condition - 2015 No Build Alternative, HDR Engineering, June 2003a*).

It is anticipated that regional development and population growth would continue to increase in the vicinity of PHX resulting in an increase in traffic volume and worsening of the roadway system in the airport vicinity. As a result, the volume of cut-through traffic would likely increase resulting in higher levels of congestion and intersection delays. In the future, improvements to non-airport roadways such as those being studied as part of the I-10 Corridor Study could reduce the volume of cut-through traffic and/or reduce the rate of traffic growth. Under the No-Action Alternative, three of seven onsite intersections would be operating at level of service "F" in 2015. As shown in **Table 4.20.3-1**, passenger trips to and from the RCC in 2015 would be generated by the utilization of shuttle buses. The RCC also would induce new roadway traffic, as an estimated 15 percent of passengers renting or returning rental vehicles would use the airport roadways (HDR, 2003a). The absence of the Stage 2 APM would further increase traffic (i.e., shuttle buses) and congestion on Sky Harbor Boulevard as passengers transit to and from the RCC and LRT. Increases in traffic would result in the Buckeye Road/24th Street, Buckeye Road/Copperhead Drive, and the Sky Harbor Boulevard/Terminal 2 Access Road intersections operating at unacceptable levels of delay in 2015 (HDR, 2003a).

TABLE 4.20.3-1
2015 PASSENGER TRIP GENERATION TO RCC

Mode	No-Action Alternative		ADP Alternative	
	Shuttle (%)	APM (%)	Shuttle (%)	APM (%)
Split Percentages	18.4	0	0	19.1
Total Daily Person Trips	18,651	0	0	19,379
Total Daily Ground Vehicle Access Trips	1,492	N/A	0	N/A

N/A = Not Applicable.
Source: *EIS Future Traffic Condition - 2015 Build Alternative* and *West Terminal EIS Future Traffic Condition - 20105 No-Build Alternative*, HDR, 2003.

The roadway congestion resulting with the No-Action Alternative has the potential to result in higher levels of roadway emissions than the ADP Alternative. Without the realignment of Sky Harbor Boulevard, increased congestion from slower traffic and/or stop and go traffic would result in reduced level of service and result in increased air emissions. Also, increased air emissions would occur on Sky Harbor Boulevard from passengers traveling to and from the RCC and LRT, via additional shuttle buses increasing VMT.

The demand for bus fuel may increase with the No-Action Alternative due to demand for either a higher number of buses and bus trips and/or longer bus idling times to accommodate boarding and alighting of increased bus passenger loads at the EEPG and Terminal 3 and 4 curbsides (*EA Automated People Mover Stage 1*, DMJM/HDR, 2004).

The No-Action Alternative would not involve realignment of Sky Harbor Boulevard, impacts to traffic flows from construction would not occur. Although there would be some construction at Terminal 2 to allow reconfiguration as a busing terminal to accommodate remote gate activities, this activity would not have any impacts on traffic flow along Sky Harbor Boulevard. There are no sensitive noise receptors within 1,000 feet of Sky Harbor Boulevard. Traffic noise impacts are not expected to occur beyond this distance.

4.20.3.2 Airport Development Program Alternative

The surface transportation improvements under the ADP Alternative would generally improve the overall transportation system in the vicinity of PHX providing a more efficient roadway system and reducing the need for vehicles. The realignment of Sky Harbor Boulevard would improve access to and from the eastern portion of the PHX property (see **Table 4.20.3-2** for intersection analysis of the future No-Action and ADP Alternatives).

Sky Harbor Boulevard, particularly the Sky Harbor Circle extension, would disperse traffic volumes over several roadways and lessen the impact on Sky Harbor Boulevard compared to the No-Action Alternative (*West Terminal EIS Future Traffic Condition - 2015 Build Alternative*, HDR Engineering, June 2003). The roadway changes and signal timing optimizations would improve the projected peak hour intersection operations. The operation of Buckeye Road would be significantly improved compared to the No-Action Alternative (HDR, 2003).

With regard to cut-through traffic volumes and system deficiencies, it is anticipated that development and population growth would continue and realignment of Sky Harbor Boulevard would be a more efficient than the existing roadway network. As shown in **Table 4.20.3-1**, passenger trips to and from the RCC in 2015 would be on the APM and reduce the number of shuttle buses. Although, the RCC would induce new cut-through traffic, an estimated 15 percent of passengers renting or returning rental vehicles would use the airport roadways (HDR, 2003a). Cut-through traffic volumes, auto and truck, would continue to increase; however, congestion levels and intersection delays would not be as significant as the No-Action Alternative with the more efficient Sky Harbor Boulevard. Increases in traffic would result in the Buckeye Road/24th Street intersection operating at a level of service "F" in 2015 (HDR, 2003). The more efficient alignment of Sky Harbor Boulevard, operation of the Stage 2 APM, and reduction of shuttle buses would increase capacity along Sky Harbor Boulevard.

The ADP Alternative has the potential to result in improved air quality in the vicinity of PHX when compared to the No-Action Alternative. With the realignment of Sky Harbor Boulevard, decreased congestion and increased speeds would result in lower air emissions. In addition, the Stage 2 APM would result in lower air emissions on Sky Harbor Boulevard as passengers transit to and from the RCC and LRT. The light rail segment that would provide a connection with the APM Stage 2 is scheduled for construction between 2005 and 2007. When completed, the APM connection to the LRT would provide a multi-modal transportation system linking PHX to communities throughout the region. This would significantly reduce shuttle busses vehicle miles traveled (VMT), as well as meet the needs of additional passengers at PHX. For construction-related air emissions, refer to **Section 4.2** of this FEIS.

Fuel demand for shuttle buses could decrease with the ADP Alternative due to a lower demand of the number of buses and bus trips (*EA Automated People Mover Stage 1*, DMJM/HDR, 2004). During construction of the realignment of Sky Harbor Boulevard, some lanes may be closed at night to accommodate construction activity. During daylight hours, traffic flow may be impacted with construction detours and slower traffic flow.

A traffic noise impact analysis is not required for the ADP Alternative since there are no noise sensitive receptors within 1,000 feet of the proposed realignment of Sky Harbor Boulevard. Traffic noise impacts are not expected to occur beyond this distance. The west side of the APM Stage 2, from the East Economy Parking Garage to Washington Street, would be within 1,000 feet of the Pueblo Grande Museum. The proposed APM Stage 2 station and maintenance facility would be west of SR 153, south of Washington Street and within the urbanized area of Phoenix. The APM at PHX will be electric powered and is not expected to significantly add to noise levels adjacent to the airport. Operational activities associated with the maintenance facility will be similar to those at adjacent offsite locations and would therefore not result in excessive noise levels. Due to the urbanized area surrounding the museum, including traffic along SR 153, Washington Street and the aircraft operations at PHX, the proposed APM would not significantly increase noise to the museum.

TABLE 4.20.3-2
INTERSECTION ANALYSIS FOR THE FUTURE NO-ACTION AND ADP ALTERNATIVES

Intersection	Future No-Action Condition				Future ADP Alternative Condition			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Avg Delay (sec)	LOS	Avg Delay (sec)	LOS	Avg Delay (sec)	LOS	Avg Delay (sec)	LOS
24th St/Air Lane	30.8	C	17.8	B	19.6	B	26.6	C
24th St/Sky Harbor Circlr North	25.1	C	39.3	D	21.7	C	23.9	C
24th St/Buckeye Rd	**	F	**	F	132.7	F	190.6	F
24th St/Sky Harbor Circle South	24.6	C	25.5	C	28.2	C	34.4	C
24th St/Old Tower Rd	15.6	B	21	C	14.4	B	15.4	B
Buckeye Rd/Copperhead Rd	**	F	**	F	14.4	B	18.3	B
Sky Harbor Blvd/Terminal 2 Access Rd	**	F	**	F	17.9	B	18.5	B

** Denotes intersection delay exceeds 80 seconds per vehicle

Sources: West Terminal EIS Future Traffic Conditions 2015 No-Build Alternative, HDR Engineering, June 2003.
West Terminal EIS Future Traffic Conditions 2015 Build Alternative, HDR Engineering, November 2003.

4.20.4 POTENTIAL MITIGATION MEASURES

Completion of the ADP Alternative's realignment of Sky Harbor Boulevard and development of the APM Stage 2 would potentially reduce traffic congestion and not significantly impact air quality. Construction impacts would be minimized through the enforcement of local and state government specifications, ordinances, and regulations. During construction activities for the realignment of Sky Harbor Boulevard, the City of Phoenix would utilize existing BMPs to avoid and minimize any potential construction impacts. As needed, additional BMPs for modifying existing roadways would be developed and implemented by the contractor to reduce traffic flow impacts. Construction activities would be performed in accordance with provisions set forth in ADOT's *Standard Specifications for Road and Bridge Construction*. Traffic could be managed with procedures and guidelines specified in the *Manual on Uniform Traffic Control Devices* (MUTCD), 2003 Edition, Revision No. 1 (or more recent editions as published). The City of Phoenix will coordinate with ADOT and FHWA to minimize any potential impacts to existing facilities within the I-10 Corridor.

4.21 OTHER CONSIDERATIONS

4.21.1 CONSISTENCY WITH PLANS, GOALS, AND POLICIES

The ADP Alternative would not conflict with the objectives of Federal, regional, state, or local land use plans, policies, or controls for the City of Phoenix area. The ADP Alternative is consistent the City of Phoenix General Plan. The updated City of Phoenix General Plan was adopted by City Council Resolution on December 5, 2001 in accord with action taken at its final public hearing on November 7, 2001. The City of Phoenix General Plan characterizes land use in the acquisition study area as industrial and the area is zoned as about 70 percent industrial and 30 percent light industrial. Development of the APM Stage 2 East connection to the LTR and APM maintenance facility would reflect a land use change, at least in part, to transit/public-quasi public, consistent with the PHX area and light rail along Washington Street. The area may be included in the transit overlay district, which currently abuts the northern end of the land acquisition area. The land use change would be minor and consistent with the City of Phoenix LRT development plans (City of Phoenix, 2004).

The proposed ADP Alternative is consistent with development goals of the City of Tempe (see Section 4.16.3.2). The City of Tempe General Plan 2030 recognizes that PHX is an economic development, tourism, and marketing asset to Tempe. The Plan also identifies PHX as contributing to air quality degradation and noise pollution in the northern half of the city. The ADP Alternative would not change off-site noise impacts resulting from aircraft operations. The forecast number of aircraft operations with the No-Action Alternative and ADP Alternative are the same. The ADP Alternative would facilitate the multi-modal movement of airport traffic, provide continued service to businesses and residents as a critical component of the regional transportation system, and support the orderly planned growth and development of the Phoenix/Maricopa County area. As a result of the improved efficiency in aircraft operations on the airport's taxiway system, and the use of the APM, onsite air emissions from the airport would be reduced.

The No-Action Alternative is not consistent with the plans, goals, and policies in that it would not allow the City of Phoenix to safely and efficiently meet the aviation goals of the airport.

4.21.2 *INCONSISTENCY WITH LOCAL PLANS AND LAWS*

The ADP Alternative is consistent with published PHX airport planning goals and objectives including the draft Airport Layout Plan. The No-Action Alternative is inconsistent with the City of Phoenix planning goals and objectives.

The airport serves as a regional economic engine, is one of the region's major employers, and supports area business and personal travel needs. The ability of PHX to continue to accommodate the efficient movement of passengers and cargo supports local economic development goals.

The ADP Alternative is consistent with the existing ALP and the intent of local planners to ensure the development of compatible land uses in the PHX area.

4.21.3 *DEGREE OF CONTROVERSY*

The FAA has conducted Agency and Scoping Meetings as well as a Public Information Workshop. A total of 10 persons registered for the Public Scoping Meeting and 9 persons registered for the October 16, 2002 Public Information Workshop. Public Workshop Meetings and Public Hearings occurred after the release of the DEIS. There were 19 registered participants at the July 12, 2005 meeting/hearing and five registered participants at the July 13, 2005 meeting/hearing. During the comment period for the DEIS, a total of 67 comments were received from the public and regulatory agencies. See Appendix G, Public Involvement, for registration sheets used at each public event.

4.21.4 *UNAVOIDABLE ADVERSE IMPACT AND IRREVERSIBLE COMMITMENT OF RESOURCES*

The construction and operation of the ADP Alternative would result in the use of resources and have environmental impacts that are unavoidable. The impacts associated with proposed improvements are disclosed for specific impact categories in this FEIS. None of the impacts are considered to be significant. Mitigation for impacts associated with those categories affected by the proposed actions is presented in Chapter 5.0 of this FEIS. The No-Action Alternative would not result in the unavoidable use of resources or environmental impacts.

4.21.5 *MAN'S RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF HIS ENVIRONMENT AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY*

The ADP Alternative would require use of the environment to achieve the long-term goals of improved terminal capacity and improved operational efficiency. Traffic delays, fugitive dust, and increased emissions from construction vehicles; visual and aesthetic impacts; and additional construction noise would occur as a result of the proposed action. These impacts, short-term in nature, would be minimized through the establishment and use of environmental controls, such as BMPs and Federal, state, and local construction guidelines.

As discussed in Chapter 1.0, Purpose and Need, the City of Phoenix is undertaking terminal and associated projects to meet current and projected demand. Long-term benefits of the proposed improvements would ultimately be the ability of PHX, as one of the nation's busiest hub airports, to efficiently handle passengers and aircraft operations. The No-Action Alternative would not enhance the long-term productivity of the airport. Short-term uses would not significantly change the short-term uses of the environment.

4.22 CUMULATIVE IMPACTS

In accordance with the Council on Environmental Quality (CEQ) guidelines, this FEIS was prepared to consider both direct and cumulative impact of the proposed project and the consequences of subsequent related actions. According to CEQ, cumulative impacts represent the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

This FEIS was specifically designed to address the above requirements regarding cumulative impacts. The EIS considered, to the extent reasonable and practical, the possible impacts of the ADP Alternative and other developments, both on and off the airport that are related in terms of time or proximity.

FAA prepared this FEIS in response to the City of Phoenix proposal to implement certain airport development projects that are depicted on the PHX 2005 draft ALP. The proposed airport development actions include the following development:

- Demolition of Terminal 2 and Ancillary Facilities,
- West Terminal Development (33-gate terminal), Garage, and Terminal Roadways,,
- Modifications to Terminal 4, Concourse N4 International Gates,
- Construction of Crossfield Taxiways "U" and "V",
- Sky Harbor Boulevard Modifications, and
- Construction of Stage 2 of the APM.

This FEIS evaluates the direct impact of these activities, where applicable, and their alternatives and evaluates them both individually and cumulatively. This FEIS also considers the cumulative impacts of other actions together with the proposed improvements at PHX to the extent they are known. The following airport-related projects are considered on a cumulative basis in this section of the FEIS:

- Airport Traffic Control Tower/Terminal Radar Approach Control Facility (ATCT/TRACON);
- Stage 1 of the APM;

- Rental Car Center;
- East Economy Parking Garage (EEPG);
- Concourses S1 and S2 at Terminal 4; and
- Northwest 2000 Plan.

4.22.1 AIRPORT-RELATED PROJECTS

As identified above, at the time of this FEIS the following are ongoing FAA actions and planned actions scheduled for PHX. Figure 4.22.1-1 identifies the potential construction schedule associated with the on-airport projects. The environmental data and analyses available for these projects were used in the development of the cumulative impact analysis for the proposed ADP Alternative. As noted in Figure 4.22.1-1, all airport-related projects at PHX, with the exception of Garage C of the East Economy Parking Garage, are scheduled for completion prior to the start of ADP construction.

Airport Traffic Control Tower/Terminal Radar Approach Control Facility (ATCT/TRACON) - PHX has received approval to construct and operate a new ATCT/TRACON. The ATCT/TRACON would replace the existing tower and TRACON facilities at the airport. The project includes the tower, a TRACON/base support building, environmental support building, parking area, security fencing, guardhouse, utility connections and demolition and removal of the existing ATCT (*Final EA, Proposed Construction and Operation of an Airport Traffic Control Tower/Terminal Radar Approach Control Facility*, FAA, 2003). The Final EA for the project resulted in a Finding of No Significant Impact (FONSI) on February 7, 2003. (*Final EA, Proposed Construction and Operation of an Airport Traffic Control Tower/Terminal Radar Approach Control Facility*, FAA, 2003). Construction of the ATCT/TRACON is ongoing. The ATCT/TRACON is expected to be operational in late 2005 or early 2006. There will be no construction-related cumulative impacts resulting from the ATCT/TRACON and ADP projects. The ADP Alternative would not alter airport operations or airspace procedures, nor increase the number of arriving or departing aircraft. Therefore, there would be no cumulative operational impacts from these projects.

Stage 1 of the APM - The City of Phoenix Aviation Department has proposed the construction of an APM that would operate as a system independent of the airport roadways to alleviate congestion on airport roadways. Stage 1 of the APM would extend from Terminal 3 to the East Economy Parking Garage (EEPG) facilities for a total distance of approximately 8,800 linear feet. Stage 1 of the APM would consist of approximately 3,000 linear feet to be constructed on an elevated track and the remaining 5,800 linear feet to be built underground. Stage 1 of the APM would also include three stations, purchase and installation of four to six APM vehicles, maintenance facility, mechanical room, train control room, fire/life safety equipment, substations and underground electrical supply. The Final EA for the project resulted in a FONSI on August 6, 2004. Construction activities are planned to begin in the Fall of 2005 and completed in summer 2008. (*Final EA, Automated People Mover, Stage 1*, DMJM Aviation/HDR, May 2004). When completed, both the Stage 1 and Stage 2 APM systems would be able to function independently. Each would be able to function independently if the other stage were not constructed. Operation of both Stage 1 and Stage 2 would optimize the efficiency of the APM system and provide the greatest long-term benefit to surface transportation and access to the airport.

Rental Car Center (RCC) - The RCC is under construction on a 140-acre site owned by PHX bordered by Buckeye Road, 18th Street/Mohave Street, I-10, and 16th Street. When completed, the RCC will accommodate up to 15 rental car companies and up to 7,400 parking spaces. The facility will include a customer service building, multi-level parking structure, maintenance building, vehicle storage and service areas (including 15 fuel storage tanks), and related infrastructure. A FONSI/ROD for the RCC was approved on October 7, 2003 (DMJM Aviation/HDR, December 2002). Construction of the RCC is estimated to be complete in late 2005 (City of Phoenix Aviation Department, 2004).

East Economy Parking Garage (EEPG) - The City of Phoenix proposes to construct a second and third parking garage within the EEP facility. The garage and associated site improvements are as follows:

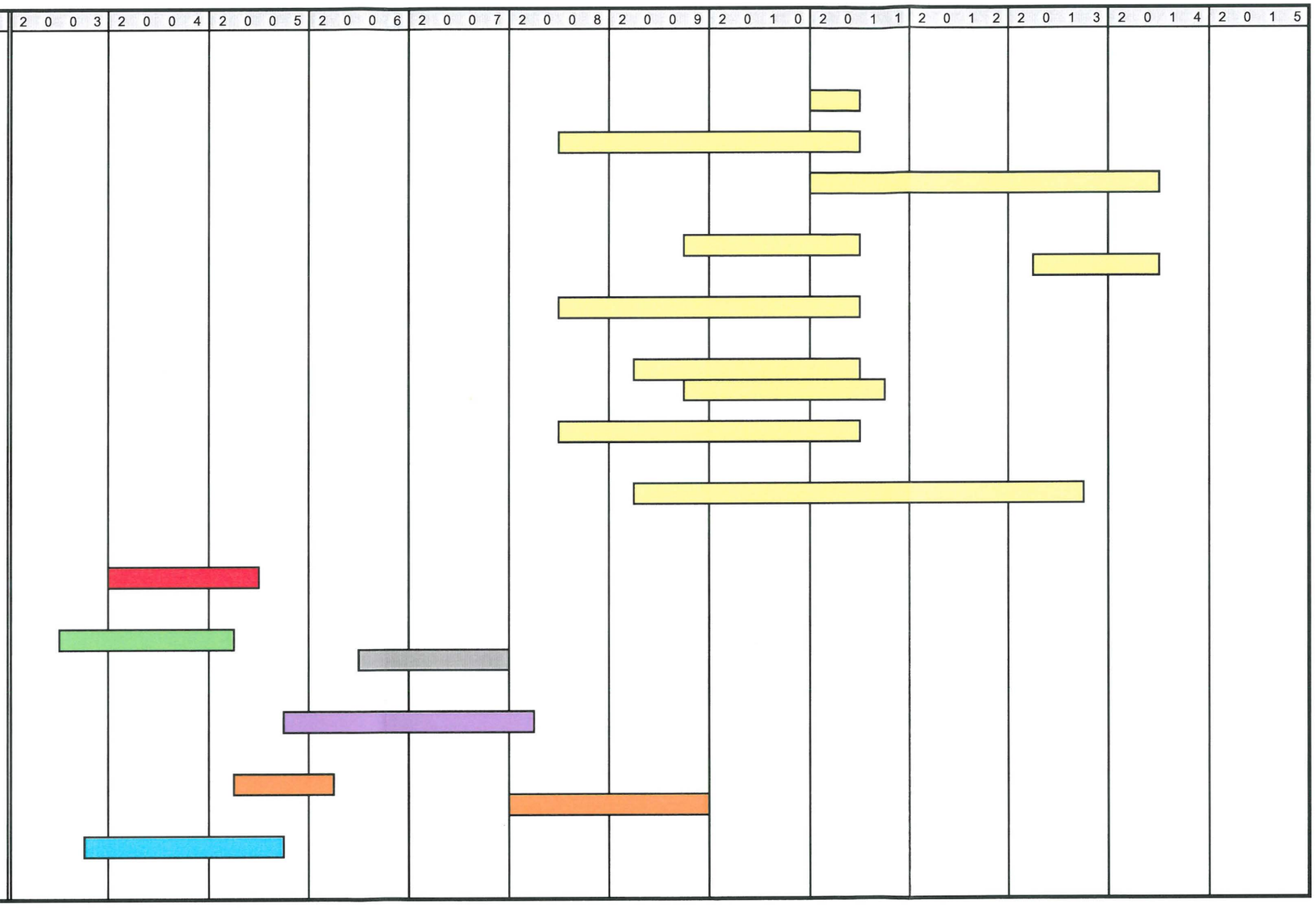
- Construction of East Economy Parking Garage Number B,
- Construction of East Economy Parking Garage Number C,
- Relocation of the EEP entry/exit toll plaza and administrative offices,
- Reconstruction of the entrance/exit roadway and adjacent embankment and the portion of the S.E. Service Road east of 42nd Street and continuation of 42nd Street into the existing EEP lot,
- Re-stripping and circulation reconfiguration within the EEP facility, as appropriate, and
- Placement of soil test bores and miscellaneous utility extensions and relocations in and around the EEP facility within the project area to accommodate the proposed facilities.

An Environmental Assessment for the EEPG was prepared by the project Sponsor and submitted to the FAA during December 2004. The FAA issued a Finding of No Significant Impact (FONSI) for the EEPG on January 26, 2005.

Concourses S1 and S2 at Terminal 4 - The airport has recently completed construction of Concourse S2 on Terminal 4. Construction of Concourse S1 will begin in 2006 and be completed in 2007. Upon completion of Concourses S1 and S2, Terminal 4 will have a total of 88 gates. Concourses S1 and S2 are each designed to accommodate up to either eight Boeing-737 sized aircraft and/or 12 regional jet aircraft. During construction, the outer lanes of eastbound Sky Harbor Boulevard, at the west end of Terminal 4, are being restricted due to construction work on Concourse S2. Ongoing lane restrictions are occurring along the southside of Terminal 4 for the duration of the Concourse S2 project. The airport submitted an Environmental Project Overview to the FAA for this project. The FAA issued a Categorical Exclusion for Concourse S1 and S2 development on April 15, 2003. Construction of Concourses S1 and S2 are required to meet the existing and future near-term shortfall in terminal and gate facilities at the airport. Construction of Concourses S1 and S2 would be completed prior to development of the ADP Alternative and there would be no construction-related cumulative impacts. Operationally, the availability of Concourse S1 and S2 gates was considered in the baseline condition for development of the EIS terminal demand/capacity analysis. If Concourses S1 and S2 were not developed, the proposed West Terminal 33-gate configuration would require reassessment to provide additional facilities to meet the projected 2015 forecast demand.

Figure 4.22.1-1
Potential Construction Schedule for
the ADP Alternative and Other On-Airport Projects

Project	Start Date	Finish Date
ADP Alternative		
Terminal 2 Demolition	Jan-11	Jun-11
West Terminal (18 Gates)	Jul-08	Jun-11
West Terminal (+15 Gates = 33 gates	Jan-11	Jun-14
West Terminal Apron		
South	Oct-09	Jun-11
North	Mar-13	Jun-14
West Terminal Roadway	Jul-08	Jun-11
Crossfield Taxiways		
Taxiway "U"	Mar-09	Jul-11
Taxiway "V"	Oct-09	Sep-11
West Roadway	Jul-08	Jun-11
APM		
Stage 2	Mar-09	Sep-13
Other On-Airport Projects		
Control Tower	Jan-04	Sep-05
Terminal 4		
Concourse S2	Jun-03	Mar-05
Concourse S1	Jun-06	Dec-07
APM		
Stage 1	Oct-05	Apr-08
East Economy Parking		
Garage B	Mar-05	Mar-06
Garage C	Jan-08	Dec-09
RCC	Oct-03	Sep-05



Source: City of Phoenix Aviation Department, 2005.

Legend: yellow = ADP Alternative projects
other colors = Other Airport Projects

Northwest 2000 Plan - The Plan consists of the implementation of air traffic control procedural changes in the Albuquerque ARTCC and the Phoenix TRACON airspace. The plan specifically calls for revised departure procedures (DP) and Standard Terminal Arrival Routes (STAR) for PHX (*Draft EA, Northwest 2000 Plan*, Landrum & Brown, 2001). The Final EA for the project resulted in a FONSI in December 2001. No cumulative impacts associated with the Northwest 2000 Plan and the ADP Alternative have been identified. The ADP Alternative would not alter or impact flight operations or airspace at or in the vicinity of the airport.

4.22.1.1 Cumulative Impacts of the Airport-Related Projects

No other FAA/City of Phoenix projects have been identified at the airport that could be implemented within the reasonably foreseeable future that would contribute to the cumulative impacts of the ADP Alternative. A thorough environmental evaluation of the airport-related projects listed above indicated they would not result in significant environmental impacts.

FAA evaluated all of the impacts addressed in this section to assess their potential for significant individual and cumulative environmental impact. All were found to have no significant impact as documented in the FONSI or Categorical Exclusion documentation for each project. The projects will produce some negative impact to the environment during construction; however, the impact would be small and generally of short duration. Particular consideration was given to the potential for cumulative impact to air quality during construction of the ADP Alternative. For the purpose of assessing cumulative impacts under NEPA, pollutant emissions due to construction activities from independent projects that FAA has reviewed and which will occur during the construction of the ADP Alternative are presented in **Table 4.22.1-1**. The only project that will have project-related emissions at the same time as the ADP Alternative is the East Economy Parking Garage C, with emissions occurring in 2008 and 2009. When combined with the emissions from the ADP Alternative, all emissions would be below the applicable General Conformity *de minimis* thresholds. This assessment of projects that are independent of the ADP Alternative is for the purpose of assessing cumulative impacts under NEPA. Under the General Conformity Rule, projects independent of the ADP Alternative are not included in the conformity analysis. During the years of construction, there will be a temporary increase in emissions due to construction activities. However, due to the ADP Alternative, operational emissions are decreased in future years.

Although the construction schedule for other planned airport projects would not overlap, the schedules for construction of the Stage 1 APM and ADP are close. In the event of any schedule slippage, these two construction projects could overlap for a short period of time.

The anticipated construction emissions for the Stage 1 APM were provided in the Environmental Assessment for the APM Stage 1 (DMJM Aviation/HDR, 2004) (see **Table 4.22.1-2**). It was determined that the total combined estimated emissions for each year associated with the combined projects (i.e., 2007, 2008) would be less that the *de minimus* levels for each of the criteria pollutants.

TABLE 4.22.1-1
ANNUAL CUMULATIVE CONSTRUCTION EMISSIONS IN THE VICINITY OF PHX (tpy)

Pollutant	2008	2009	2010	2011	2012	2013	2014
Carbon Monoxide							
- ADP Alternative	11	46	73	48	48	25	11
- Parking Garage C	5	2	0	0	0	0	0
Total CO Emissions	16	48	73	48	48	25	11
Applicable *de minimis* Level[1]	100	100	100	100	100	100	100
Nitrogen Oxides							
- ADP Alternative	21	44	43	29	21	11	5
- Parking Garage C	9	5	0	0	0	0	0
Total NOx Emissions	30	49	43	29	21	11	5
Applicable *de minimis* Level[1]	50	50	50	50	50	50	50
Particulate Matter - 10 Microns							
- ADP Alternative	9	13	13	11	9	8	8
- Parking Garage C	4	2	0	0	0	0	0
Total PM_{10} Emissions	13	15	13	11	9	8	8
Applicable *de minimis* Level[1]	70	70	70	70	70	70	70
Volatile Organic Compounds							
- ADP Alternative	2	4	5	13	3	2	1
- Parking Garage C	1	1	0	0	0	0	0
Total VOC Emissions	3	5	5	13	3	2	1
Applicable *de minimis* Level[1]	50	50	50	50	50	50	50

[1] This information is being provided for disclosure purposes only. Under the General Conformity Rule, applicability is determined by comparing project-related direct and indirect construction and operation emissions to *de minimis* thresholds (see Section 4.2 of this FEIS).

Source: Data derived by URS Corporation, 2004.

TABLE 4.22.1-2
ANNUAL EMISSION ESTIMATES ASSOCIATED WITH CONSTRUCTION OF THE STAGE 1 APM

Pollutant	De Minimis Threshold (tons per year)	Emissions Associated with Construction (tons)
		Total[a]
PM_{10}	70	43
Volatile Organic Compounds	50	2.5
Carbon Monoxide	100	17
Sulfur Dioxide	100	4.2
Nitrogen Dioxide	50	28

[a] Over an assumed 30-month construction period

Source: Environmental Assessment, Automated People Mover, Stage 1, DMJM Aviation/HDR, 2004.

4.22.2 NON AIRPORT-RELATED PROJECTS

The following section discusses projects that are proposed for implementation within proximity of PHX and within the EIS GSA (see Figure 4.22-2). The EIS GSA is defined as the area surrounding PHX that could have been previously encompassed by the 65 DNL contour for any alternatives evaluated in this FEIS. The GSA encompasses portions of Maricopa County and the cities of Phoenix, Scottsdale, and Tempe.

Projects discussed in this section are limited to those within the EIS GSA that are included within the MAG approved growth management plans for the Phoenix area. The projects listed are reasonably foreseeable based on state and local planning documentation. The discussion is presented in terms of significant surface transportation improvements and proposed land development projects. Figure 4.22-3 provides information on the current status and schedule for construction of the non airport-related projects in relation to the ADP Alternative schedule.

4.22.2.1 Surface Transportation Improvements

Valley Metro Light Rail - The Valley Metro Rail will connect the cities of Phoenix, Mesa, and Tempe, Arizona. The light rail line will follow south on Central Avenue towards Washington Street, east along Washington Street to about South Mill Avenue sloping towards East University Drive and continuing eastward to Apache Boulevard and Main Street. Construction includes rails and 27 passenger terminals. Rail line sections 3, 4, and 5 along with the construction of a bridge over the Salt River would be in the vicinity of PHX. Construction is scheduled from 2004-2008. Revenue Operations Date for the entire Valley Metro Light Rail is expected for sometime in late 2008 (Valley Metro Rail, September 2004).

I-10 Corridor Improvement Study - ADOT in cooperation with FHWA, is preparing a Design Concept Report (DCR) and an EIS for a proposed improvements to I-10 from just south of SR 51 to just north of the Santan Freeway (202L) and from 7th Street on I-17 to Mill Avenue on US 60. Connections with I-17, US 60, SR 143, the planned SR 153, and local arterial streets will also be assessed.

The I-10 Corridor Improvement Study will evaluate current roadway conditions and alternatives to improve the safety, capacity, and operational characteristics of I-10. Alternatives considered will be evaluated for environmental impacts to residential and commercial development, including PHX, cultural resources, historic roads and canals, endangered species, jurisdictional waters of the U.S., air and noise quality, and hazardous waste (Arizona Department of Transportation, September 2004a). The timing of construction depends primarily upon funding availability and what priority the corridor is given by regional and state officials.

Sky Harbor Freeway Extension (SR 153) - Sky Harbor Freeway begins at University Drive a short distance north of I-10/U.S. 60 and ends at Van Buren Street just shy of Loop 202. Its only connection to the freeway system is via the long exit ramp from Loop 202 and Arizona 143 to the east of PHX. This expressway facility provides access to PHX from the regional freeway network. As part of a five-year plan, the $810 million Valley Freeway Construction Program will fund improvements to extend the Sky Harbor Freeway (SR 153) between University Drive and I-10 (Maricopa Association of Governments,

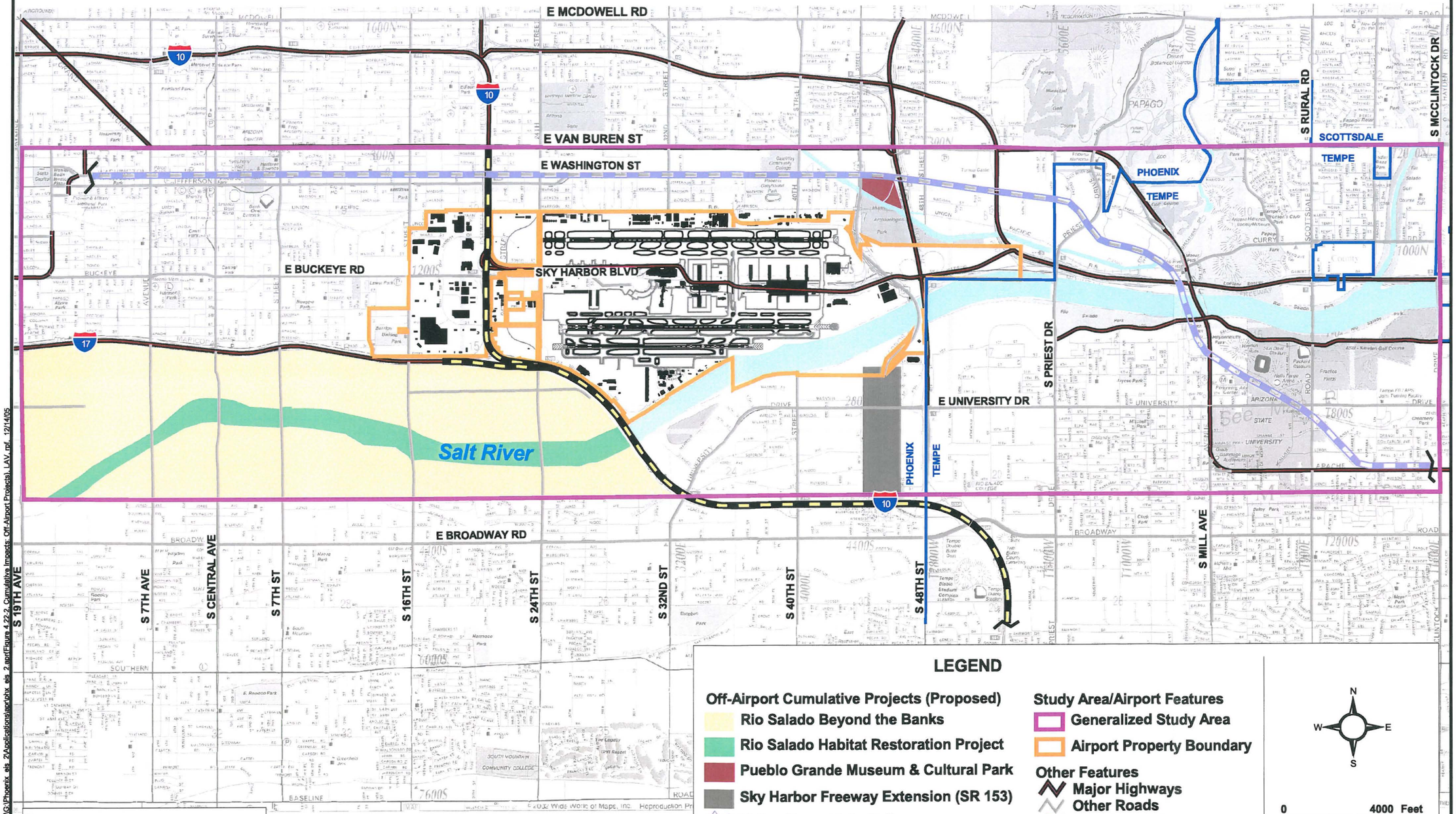
September 2004). The Sky Harbor Freeway extension is estimated to be complete by 2007 (Arizona Department of Transportation, September 2004b).

South Mountain Transportation Corridor Study - ADOT is preparing the South Mountain Transportation Corridor EIS for a proposed freeway to connect I-10 south of Phoenix with I-10 west of the city, following an east-west alignment along Pecos Road, through the western tip of South Mountain Park, north to I-10 between 55th and 63rd avenues. While construction of a single new freeway will not solve the Valley's entire traffic congestion problem, an I-10-to-I-10 connection south and west of South Mountain could have a positive impact. MAG estimates that use of the facility could reduce the demand on other Valley roads. The FEIS is scheduled for release in 2005 (Arizona Department of Transportation, September 2004b).

4.22.2.2 Land Development Projects

Rio Salado Beyond the Banks - The habitat restoration and neighborhood improvements encompass an area from Broadway Road up to I-10 and I-17, from 19th Avenue to 32nd Street. The five-year plan, as of November 2003, includes monitoring or updating the Interim Overlay Districts or initiating new zoning districts to include design guidelines for the area. The plan would include completion of the Audubon Nature Center and construction of scenic parkways along the river, on the north and south side with new developments to complement the drives. The plan calls for the construction of three new plazas at Central Avenue and Rio Salado, two new neighborhood parks south of the river and east of 7th Street, and at least three new canal trails along 7th, 24th, and 32nd streets and North Branch San Francisco Canal (City of Phoenix Planning Department, September 2004). The Rio Salado Beyond the Banks project is scheduled for a public opening in 2005.

Rio Salado Habitat Restoration Project - The Rio Salado Habitat Restoration Project is located in a five-mile section of the Salt River within the City of Phoenix. The site totals 580 acres and extends from the I-10 crossing on the eastern upstream end to 19th Avenue on the western end. The project site includes the overbanks, typically within 50 feet of the top of bank, slopes of the banks to the terrace level, terrace level, and Low Flow Channel. The Phoenix Rio Salado Habitat Restoration Project is to restore the native wetland and riparian (i.e., riverbank) habitats that were historically associated with the Salt River. The restoration project will include a ten-mile system of paved trails about the native habitat of the Salt River, a visitor center and staging areas including parking lots, shade structures/overlooks, and information kiosks. Additional features could include Scenic Overlooks, Pedestrian Bridges, Project Markers, Entry Monuments, Trail Maps, and Outdoor Classrooms (City of Phoenix Planning Department, September 2004).



Sources:
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-City of Phoenix, AZ. General Plan, 2001
-City of Tempe AZ. General Plan 2020, 2001
-City of Scottsdale AZ. General Plan, 2001
-URS Corporation

LEGEND

Off-Airport Cumulative Projects (Proposed)
- Rio Salado Beyond the Banks
- Rio Salado Habitat Restoration Project
- Pueblo Grande Museum & Cultural Park
- Sky Harbor Freeway Extension (SR 153)
- Valley Metro Light Rail
- I-10 Corridor Study

Note: The South Mountain Corridor Study is located outside the GSA.

Study Area/Airport Features
- Generalized Study Area
- Airport Property Boundary

Other Features
- Major Highways
- Other Roads
- City Boundaries
- Water Bodies

N W E S

0 4000 Feet
Scale: 1" = 4000'

Phoenix Sky Harbor
INTERNATIONAL AIRPORT
Environmental Impact Statement

Cumulative Impacts: Off-Airport Projects within the Generalized Study Area

FIGURE 4.22-2

c:_516\gis\c1_375-GIS Data 2\IG-\Phoenix_eis_2\Applications\arcview_eis_2.apr\Figure 4.22-2_Cumulative Impacts_Off-Airport Projects).LAY, mxd, 12/14/05

Figure 4.22-3
Schedule for Construction of
Cumulative Projects and ADP Alternative

Project	Status	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Valley Metrolight Rail	FEIS completed; Construction in progress													
I-10 Corridor Improvements	EIS in process; Construction contingent upon funding and need		TO BE DETERMINED AT A LATER DATE											
Sky Harbor Freeway Extension (SR153)	In Planning Review													
South Mountain Transportation Corridor Study	EIS in process. DEIS to be released in late 2005													
Rio Salado Beyond The Banks	Under construction													
Rio Salado Habitat Restoration	Under construction													
Pueblo Grande Museum and Cultural Park	Phase 1 complete; Phases 2 in process; Phase 3 - to be determined													
Terminal 2 Demolition	ADP Alternative EIS in process													
West Terminal (18 Gates)	ADP Alternative EIS in process													
West Terminal (+15 gates = 33 gates)	ADP Alternative EIS in process													
West Terminal Apron	ADP Alternative EIS in process													
West Terminal Roadway	ADP Alternative EIS in process													
Crossfield Taxiways	ADP Alternative EIS in process													
West Roadway	ADP Alternative EIS in process													
APM: Stage 2	ADP Alternative EIS in process													
Control Tower	Under construction													
Terminal 4	Concourse S2 complete		CONCOURSE S2			CONCOURSE S1								
APM: Stage 1	FONSI issued; Currently in design phase													
East Economy Parking	Under construction			GARAGE B			GARAGE C							
RCC	Under construction													

Source: City of Phoenix Aviation Department, 2005.
Maricopa Association of Governments, 2004
Arizona Department of Transportation, 2004
URS Corporation, 2005

Pueblo Grande Museum and Cultural Park - The museum and park is located on 103 acres at the southeast corner of Washington Street, and 44th Street (SR 153). Planning and Phase One construction occurred from 1992–1995. There are two phases remaining to the project. Phase Two will add overflow parking; a Market, including landscaping, south levee wall treatments, and Grand Canal Bridge; outdoor improvements; and initiation of revegetation south of Southern Pacific Railroad. Phase Three will complete the project with a visitor orientation and meeting room constructed in the north plaza area; education areas in the outdoor and north plaza areas; the demonstration village constructed in the area east of the Old Cross-Cut Canal; Grand Canal hardscape improvements including water courts, bridges, and observatory tower; the underpass under the Southern Pacific Railroad and the Nature Walk improved to the Park of Four Waters, construction and improvements of a tower and facility at the Park of Four Waters; and the Park of Four Waters improvements to show the canals in the original condition. (*Pueblo Grande Museum and Cultural Park Master Plan,* January 1998)

4.22.3 POTENTIAL CUMULATIVE IMPACTS OF THE OFF-AIRPORT PROJECTS

Because the previously discussed projects within the vicinity of the PHX are in various stages of planning and/or construction, it was not possible to fully quantify the impacts associated with them. Projects in the planning phase cannot provide enough data to ensure complete analysis. As such, a qualitative evaluation of the potential environmental impacts associated with these projects has been conducted. The analysis incorporates information and lessons learned from other studies and projects nationwide. Based on these other studies, the severity of potential impacts resulting from the cumulative off-airport projects were given a subjective ranking of low, medium, or high. A rating of low indicates that there would be no or minimal impact associated with the project. Mitigation would not be warranted. A medium impact indicates that there would be an observable impact to the resource, but the impact could be effectively mitigated. A high level of impact indicates that there would be a high probability of significant impact to the resource, and extensive mitigation would be required. **Table 4.22.4-1** provides a summary of the impact analysis for the cumulative off-airport projects. When interpreting the ranking information in this table, consideration should be given to the fact that projects listed are primarily in the early development phase. As such, planners developing these projects have the opportunity and would likely incorporate design features to minimize and mitigate many of the potential impacts that have been identified. The following sections provide an overview of potential environmental impacts in various impact categories.

4.22.3.1 Air Quality

Implementation of the cumulative projects could result in both temporary and permanent impacts to air quality in the vicinity of PHX. Temporary impacts would result from construction activities and primarily consist of fugitive dust and increased emissions from construction vehicles. Air quality construction impacts would be temporary in nature and be minimized through the establishment and use of environmental controls, such as BMPs, and Federal, state, and local construction mitigation guidelines. Adherence to the design standards and guidelines contained in state or local standardized specifications for roads and structures could help minimize temporary air quality impacts. Cumulative projects such as the Valley Metro Light Rail, 1-10 Corridor Improvements or South Mountain Transportation Corridor could result in less vehicles on airport area roads or improved traffic flow in the vicinity of PHX thereby reducing air quality impacts.

4.22.3.2 Coastal Zone Management Program/Coastal Barriers

The vicinity of PHX does not lie within an area covered by coastal management plan and is not located on a coastal barrier; therefore, cumulative projects would not result in impacts to these resources.

4.22.3.3 Compatible Land Use

Land use impacts would occur as a result of the cumulative projects. These projects would contribute to increased development of vacant land uses near the airport. The Sky Harbor Freeway Extension, Valley metro Light Rail, or Rio Salado Beyond the Banks cumulative projects would impact land uses in the vicinity of PHX. It is expected that the cumulative projects would comply with the land use and transportation goals of the Maricopa County Comprehensive Plan, 2020 *Eye to the Future* (Maricopa County Planning and Development, September 2004) which would reduce the potential for impact.

4.22.3.4 Construction Impacts

Construction activities associated with the cumulative projects would consist of land clearing, roadway and building construction, and remediation projects. Impacts from construction would include increased noise from construction operations, temporary increase in water turbidity, temporary increase in air emissions and disposal and management of construction and/or demolition wastes.

Grading and scraping operations are the noisiest activities, with equipment generating noise levels as high as 70 to 95 dBA within 50 feet of their operations. However, distance would rapidly attenuate noise levels so area residences would only experience a slight increase in ambient background conditions.

Temporary increases in water turbidity in drainage areas could occur during the period when excavated areas are exposed prior to paving or cover stabilization. It is expected that runoff from construction projects would be minimized by BMPs that would limit sediment transport, such as straw or baled hay barriers and the use of turbidity curtains. In addition, it is expected that efforts would be made to schedule construction operations to minimize the exposure of excavated areas and re-vegetate them as soon as possible after grading.

Construction equipment emissions, fugitive dust pollution from excavated areas, and burning of vegetative materials can all result in temporary impacts to ambient air quality. However, it is expected that these impacts would be minimized by the use of BMPs that could minimize air quality impacts by treating excavated areas with water, covering graded areas with stabilizing materials, and not allowing open burning during unfavorable weather conditions.

Land clearing and grading operations associated with the construction of the cumulative projects could generate air emissions, with particulate matter (dust) having the greatest potential of impact. Most of this dust would redeposit close to the source, since it is generated low to the ground. Heavy construction equipment utilized will emit exhaust that contains CO, NO_x, VOCs, and PM. Temporary air quality impacts associated with these sources would vary depending on the local weather conditions, level of construction activity, and the nature of the construction operation.

The types of waste generated by construction activities could include materials such as excess concrete and/or asphalt washed out of mixer trucks, excess wiring, conduits, and other electrical materials, and empty construction supply containers. These materials are not anticipated to significantly impact existing landfill operations. These controls are consistent with requirements contained in the City of Phoenix AZPDES Construction General Permit. All contractors performing work at the airport are required to comply with these requirements. The City of Phoenix Aviation Department performs routine surveillance during construction to document this compliance. During construction of the ADP Alternative, additional pollution prevention measures will be implemented, as needed, to avoid or minimize any potential impacts.

The impacts discussed above would be temporary in nature. Temporary pollution controls employed by the sponsor should include limiting work activities to normal business hours; no open burning; wetting of active equipment work areas; covering of all trucks hauling loose materials; stabilizing materials, mulch, sandbags, slope drains, sediment basins, sediment checks, artificial covering and berms. All applicable local, state, and Federal environmental construction controls should be incorporated into the specifications and construction plans necessary for the individual cumulative projects. These controls would help minimize temporary impacts.

4.22.3.5 Department of Transportation Act Section 4(f)

Two of the cumulative projects consist of improving park facilities (the Pueblo Grande Museum Master Plan and Rio Salado Habitat Restoration Project). The other referenced cumulative projects could contribute to urbanization within the area and impacts to sites protected under Section 303(c) of the USDOT Act could occur as a result of their implementation. See **Section 4.22.3.10**, for Historic, Architectural, Archaeological and Cultural impacts of the cumulative projects.

4.22.3.6 Farmlands

Growth in Phoenix has resulted in increased urbanization and a resultant loss of existing open space and wild areas. Implementation of the cumulative projects could result in further changes in land cover, and increased conversion of active and inactive farmlands to urban land uses. However, since the cumulative projects occur within such an urbanized area, it is not likely that farmland impacts would occur.

4.22.3.7 Fish, Wildlife and Plants

Fish, wildlife and plants within the vicinity of PHX have been and continue to be impacted by urban development. Urban development has resulted in the loss of natural communities throughout much of the area. Implementation of the cumulative projects could result in further changes in land cover. The cumulative project, Rio Salado Habitat Restoration Project, has the potential to improve biotic community habitats in the vicinity of PHX.

4.22.3.8 Floodplains

The cumulative projects could result in impacts to lands within the 100-year floodplain. Floodplain impacts could be the result of the development of new and/or relocation of, impervious surface within the Salt River and Grand Canal. As discussed in the Central Phoenix/East Valley Corridor FEIS, development of the 44th Street Light Rail Station would require construction within the 100-year floodplain. The 44th Street Station will provide a connection with the ADP Alternative Stage 2 APM at this location. These projects could have an impact on recharge/discharge areas in the area and result in a degradation of surface water quality. Mitigation of these impacts will be required.

4.22.3.9 Hazardous Substances and Solid Waste

Potential hazardous substance sites have the potential to occur within the areas of the cumulative projects and could potentially be disturbed as a result. It is possible that development of the cumulative projects could result in impacts to known (on record with the EPA) and/or unrecorded hazardous material sites. If any hazardous materials or sites are encountered as part of these projects, the materials would be handled in accordance with all Federal, state, and local rules and regulations and BMPs.

Growth in the Maricopa County area as a whole over the years has resulted in increased demand for services including solid waste collection and disposal services. Implementation of the cumulative projects could result in further increased solid waste handling/disposal facilities. Solid waste disposal services would be the responsibility of the local municipalities. The City of Phoenix's Skunk Creek Landfill is projected to be at capacity in late 2005. The new City of Phoenix Buckeye Landfill currently in development and expected to open in 2005, will provide the city with capacity for approximately the next 50 years.

4.22.3.10 Historic, Architectural, Archaeological and Cultural Resources

Due to the number of historic sites identified within the GSA and the historic culture associated with the City of Phoenix and Maricopa County area, there is a potential for the cumulative projects to result in impacts to sites protected under Section 106 of the National Historic Preservation Act. Construction and improvements outlined in the Pueblo Grande Museum and Cultural Park Master Plan could impact the historic and cultural resources. If Federal actions are required for any of these projects, then the consultation process required by Section 106 should be followed, which could result in specific analysis of potential impacts and identification of possible mitigation measures. The Valley Metro Light Rail project also has the potential to result in impacts to the Pueblo Grande historic site. These impacts have been addressed in the Central Phoenix/East Valley Corridor Final Environmental Impact Statement dated November 1, 2002. Mitigation strategies to prevent construction-related, as well as visual and light-related impacts to the Pueblo Grande have been documented in the FEIS. The ADP Alternative would be developed in coordination with FAA, the Director of the Pueblo Grande Museum and Archaeological Park, City of Phoenix Archaeologist, City of Phoenix Historic Preservation Officer, and SHPO throughout the design process to ensure that a sensitive and compatible design will avoid adverse visual effect to the Pueblo Grande Museum and Archaeological Park (see Appendix C).

4.22.3.11 Light Emissions and Visual

Potential development of the cumulative projects, including highways/roadways, may result in increased ambient nighttime light emissions, which could impact the nighttime visual character of the area. Surface transportation improvement projects identified in Section 4.22.1 could result in the additional light emission and visual impacts.

It is anticipated that the ADP Alternative in this FEIS when considered with these on- and off-airport projects would not have significant cumulative visual impact.

4.22.3.12 Natural Resources and Energy Supply

Growth in the Maricopa County area as a whole over the years has resulted in increased demand for services including energy services. Implementation of the cumulative projects could result in further increased demand for energy. Arizona Public Service has or is planning for sufficient generating capacity to meet the needs of the Phoenix/Maricopa County area. Additional transmission and distribution capacity would be required to meet these long-term growth needs.

4.22.3.13 Noise

Implementation of the cumulative projects discussed above could generally result in temporary noise impacts to the human and natural environment. Temporary noise impacts would primarily occur from construction activities such as land clearing, truck hauling, paving, and general construction operations. The cumulative projects could introduce permanent new noise into areas surrounding PHX as a result of increased traffic volumes. Cumulative projects such as the Valley Metro Light Rail, 1-10 Corridor improvements, Sky Harbor Freeway Extension or South Mountain Transportation Corridor have the potential to affect noise in the vicinity of PHX. Due to the highly developed roadway system in the immediate vicinity of PHX, the implementation of cumulative projects in the vicinity of the airport are not anticipated to result in a significant, permanent increase in noise levels.

4.22.3.14 Secondary (Induced), Socioeconomic, Environmental Justice and Children's Health

The cumulative projects would result in a change in socioeconomic conditions in the GSA. Implementation of the cumulative projects could also generate an increase in employment within the GSA. Airport expansion to accommodate increased future demand for services has been incorporated into local plans and the ability to serve that increased demand more efficiently minimizes future potential impacts. In particular, additional surface transportation and public infrastructure projects in the vicinity of the airport would help accommodate projected future growth and development within the surrounding area. Current proposed transportation improvements would not be affected by the proposed airport improvements, since there is no expected difference in terms of the projected number of aircraft operations at the airport for either the ADP Alternative or the No-Action Alternative.

Development of the cumulative projects would not have a disproportionate impact on minority populations or children's health within the GSA. The Rio Salado projects will enhance the environment adjacent to the Salt River and would include the construction of new neighborhood parks and walking trails. The

Pueblo Grande Museum and Cultural Park would be developed on existing park property and would not result in any long-term offsite impacts. Development of the I-10 corridor would be accomplished along the existing interstate right of way. When completed, an improved I-10 could reduce vehicular emissions in the study area by removing vehicles from less efficient roadways and reducing transit times through the GSA. The Valley Metro Light Rail would similarly reduce vehicular emissions. The impact of land acquisition for the Valley Metro Light Rail on minority populations was addressed in the Central Phoenix/East Valley Corridor FEIS, and appropriate mitigation has been developed to address these impacts.

In the future, any comprehensive approach to an increase in the transportation capacity within the vicinity of PHX would help to serve the projected increase in demand at the airport. These projects over time would minimize the potential long-term negative impacts for increasing congestion on the future economic growth and development of the region.

4.22.3.15 Water Resources

Implementation of the cumulative projects could result in both temporary and permanent impacts to water quality. Temporary impacts could result from land clearing and construction activities and primarily consist of potential increases in sediment runoff and transport, siltation, and changes in storage volumes, flow velocities and pollutant levels in receiving water bodies. Construction impacts would be temporary in nature and could be minimized through the establishment and use of BMPs, and Federal, state, and local construction mitigation guidelines. All off-airport construction activities should adhere to the design standards and guidelines contained in state and local specifications for roads and structures. These standards would help minimize temporary water quality impacts.

The cumulative projects could also result in permanent water quality impacts. Impacts could primarily result from the runoff of stormwater from newly constructed roadways and associated impervious surfaces. Commercial construction in the vicinity of PHX could be required to utilize onsite water retention and water quality control measures to prevent degradation of water quality in groundwater and receiving bodies. Enhancements to water quality would result from development of the Rio Salado Habitat Restoration Project which would restore the wetland and riparian habitat along the river.

4.22.3.16 Wetlands

Allthough neither the No-Action nor the ADP Alternative would have impacts to wetlands, implementation of the cumulative projects could result in both temporary and permanent impacts to wetlands. Temporary impacts could result from land clearing and construction activities and could be minimized through the establishment and use of BMPs, and Federal, state, and local construction mitigation guidelines. All off-airport construction activities should adhere to state and local design standards and guidelines. These standards could help minimize temporary wetland impacts.

Impacts could consist of potential increases in sediment runoff and transport, siltation, erosion and potential changes in storage volumes, flow velocities and pollutant levels in receiving water. It would be the responsibility of the individual cumulative project's sponsoring agency/local municipality to initially avoid any impacts to wetlands, and where impacts are unavoidable, to minimize these impacts and

provide compensatory mitigation because the sponsoring agency/municipality would be required to obtain any necessary Federal permit and state certification (Section 404/401) prior to the initiation of construction activities. The Rio Salado Restoration Project proposes to restore the native habitats along the Salt River. This cumulative impact could improve the wetland and native habitats in the vicinity of PHX.

4.22.3.17 Wild and Scenic Rivers

The cumulative projects would not impact any Wild and Scenic Rivers because there are no designated Wild and Scenic Rivers within or in proximity to the cumulative projects.

4.22.4 SUMMARY OF CUMULATIVE IMPACTS

FAA evaluated all on- and off-airport projects addressed in this section to assess their potential for significant environmental impacts (Table 4.22.4-1). This table also provides a qualitative ranking of the potential cumulative impacts for all projects.

The ADP Alternative, when considered in conjunction with the other on-airport and off-airport projects, including surface transportation, land development, and public infrastructure projects, would have the potential to result in environmental impacts. However, with the exception of the East Economy Parking Garage C, Valley Metro Light Rail, and the South Mountain Transportation Corridor, construction schedules for the non-ADP Alternative projects do not coincide. Furthermore, although tentatively planned for the period of 2009 to 2015, the construction schedule for the South Mountain Transportation Corridor is highly suspect and contingent upon funding. Based on the potential level of impact as discussed in Section 4.22.3 and the significant difference in construction phasing, the ADP Alternative would not result in a significant cumulative impact to the GSA or Maricopa County.

4.23 DESIGN, ART AND ARCHITECTURE

Potential visual impacts of the alternatives were considered in accordance with FAA Order 5050.4A 44(c). The primary areas of consideration were:

- Extent of earthmoving required to construct the proposed alternatives,
- Design of facilities (terminal and access road developments), and
- Aesthetic integrity of the area.

The extent of the earthmoving process during construction of the ADP Alternative would create visual disturbance of the landscape to passersby. However, this impact would be temporary and would not result in significant impacts. Control of erosion during this time would be in compliance with FAA AC 150/5370-10B, *Standards for Specifying Construction of Airports.*

FAA Order 5050.4A states that design factors should be employed that would complement and support establishment of functional, efficient, and safe airport facilities while reflecting local, cultural, and architectural heritage considerations. The ADP Alternative including the West Terminal Complex, crossfield taxiways, realignment of Sky Harbor Boulevard, APM Stage 2 (track station and maintenance facility) would be designed in accordance with FAA requirements (FAA AC 5300-13, *Airport Design)* and city and state building codes. Although no specific design plans are currently available, the City of Phoenix would encourage the ADP Alternative to be designed in a manner that is compatible with the existing airport environs. As appropriate, the City would consult with the City Historic Preservation Office and interested stakeholders to identify and resolve design issues. Landscaping would be accomplished with native vegetation and the inclusion of architectural treatments such as coloring of structural elements, buffer areas, and screening landscaping into the development's design would minimize the visual impacts of the ADP Alternative, while at the same time minimizing wildlife attraction as per FAA Order 150/5200-33.

The ADP Alternative would create a temporary visual disturbance during construction and long-term impacts to the visual aesthetic integrity of the area. Airside improvements (i.e., West Terminal Complex) would visually impact persons traveling along I-10. No residential areas would experience visual impacts due to construction activities. Few measures to mitigate an airfield's visual impact can be accomplished.

However, the City of Phoenix would work with the local communities to minimize visual impacts to the extent possible while not compromising aviation safety. Landside improvements associated with the ADP Alternative could impact the aesthetic integrity of the area; however, vegetation and design factors would be employed to complement the ADP Alternative. Vegetation used to minimize visual impact would be selected and specified with the assistance of a qualified wildlife biologist so as to not result in wildlife attraction that could pose a safety risk to aircraft operations.

4.23.1 MITIGATION

If mitigation is required, the following measures would be considered to be incorporated in the landside and roadway designs in order to create an aesthetically acceptable and functional alternative and to minimize visual impacts:

- Integrate landscaping into the project design to promote visual continuity of the airside, landside, and surface transportation improvements and to blend it into the natural landscape as much as possible;
- Minimize the loss of vegetation, especially during construction when equipment and material access, storage, and staging is required;
- Design noise attenuation features, if needed, to be compatible with surrounding natural features and development; and
- Consultation with CHPO and other stakeholders, as appropriate.

The above mitigation measures would be designed not to attract hazardous wildlife in order to ensure it is compatible with safe airport operations as per FAA AC 150/5200-33. Future development, unrelated to the ADP Alternative, which may be constructed adjacent to the ADP Alternative, would be designed to reduce the visual impacts. The inclusion of treatments such as coloring of structural elements, buffer areas, and screening landscaping into a new development's design would lessen any impacts.

TABLE 4.22.4-1
POTENTIAL FOR ENVIRONMENTAL IMPACTS FROM CUMULATIVE PROJECTS

	Level of Impact								
Environmental Impact Categories	**ADP Alternative**	**Valley Metro Light Rail**	**I-10 Corridor**	**Sky Harbor Freeway Extension (SR 153)**	**Rio Salado Beyond the Banks**	**Rio Salado Habitat Restoration**	**South Mountain Transportation Corridor Study**	**Pueblo Grande Museum and Cultural Park**	**Impact Summary All Projects**
Air Quality - Operational Air Emissions	Low	Low	High	Moderate	Low	Low	Moderate	Low	Moderate
Construction Impacts	Moderate	High	High	High	Moderate	Low	High	Low	High
Compatible Land Uses	Low	High	Moderate	Moderate	Low	Low	High	Low	Moderate
DOT Section 4(f)									
Direct Impacts	Low	Moderate	Moderate	Low	Low	Low	Moderate	Low	Low
Indirect Impacts	Low	Moderate	Moderate	Low	Low	Low	High	Low	Moderate
Farmlands (acres)	Low	Low	Low	Low	Low	Low	Low	Low	Low
Fish, Wildlife and Plants (Number of Species/Acres)	Low/Low	Low	Low	Low	Low	Low	Low	Low	Low
Floodplains	Moderate	Moderate	Low	Low	Moderate	High	Moderate	Low	Moderate
Hazardous Materials	Low	High	Moderate	Moderate	Low	Low	Low	Low	Moderate
Solid Waste									
Construction and demolition debris	Low	High	High	Moderate	Low	Low	High	Low	Low
Landfill proximity conflicts	Low	Low	Low	Low	Low	Low	Low	Low	Low
Historic, Architectural and Cultural	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Low	Low	Moderate
Light Emission/Visual	Moderate	Moderate	Moderate	Moderate	Low	Low	Moderate	Low	Low
Natural Resources/Energy	Low	Moderate	Low	Low	Low	Low	Moderate	Low	Low
Noise (Acres within the DNL 65 dBA)	Low	Low	Low	Moderate	Low	Low	Moderate	Low	Low
Secondary (induced) Impacts									
Acquisitions and relocations (residential/business)	Low	Moderate	Moderate	High	Moderate	Low	High	Low	Moderate
Division or disruption of established communities	Low	Low	Low	Moderate	Low	Low	High	Low	Low
Alteration of surface transportation patterns	Low	Moderate	Moderate	High	Low	Low	High	Low	High
Disruption of orderly planned development	Low	Low	Low	Low	Low	Low	Moderate	Low	Moderate
Appreciable change in employment (additional employees at PHX)	Low	Low	Low	Low	Moderate	Low	Moderate	Low	Low
Socioeconomic, Environmental Justice, Children's Health									
Shifts in population movement and growth	Low	Moderate	Low	Low	Low	Low	Moderate	Low	Low
Changes in public service demands	Low	Low	Moderate	Low	Low	Low	Moderate	Low	Low
Changes in business and economic activity	Moderate	Moderate	Low	Moderate	Moderate	Low	Moderate	Low	Moderate
Environmental justice considerations	Low	Low	Moderate	Moderate	Low	Low	Moderate	Low	Moderate
Environmental health and safety risks	Low	Low	Low	Low	Low	Low	Moderate	Low	Low
Water Resources	Low	Low	Moderate	Low	Low	Low	Low	Low	Low
Wetlands (acres)	Low	Low	Low	Low	Low	Low	Low	Low	Low
Wild and Scenic Rivers	Low	Low	Low	Low	Low	Low	Low	Low	Low

Source: URS Corporation, 2005.

Chapter 5.0
Mitigation

CHAPTER 5.0
MITIGATION

5.1 INTRODUCTION

This chapter describes the mitigation program that would be developed for the ADP Alternative following review of any comments received on the FEIS should the ADP Alternative be selected as the preferred alternative by the FAA. As discussed in **Chapter 4.0**, Environmental Consequences, there are no significant environmental impacts associated with the ADP Alternative. The ADP Alternative would reduce air emissions at PHX resulting from aircraft engine and motor vehicle operations. The ADP Alternative would result in non-significant environmental impacts to several resource categories, which would not require mitigation. However, construction and/or operational mitigation measures may be implemented to minimize the potential for any impact.

The mitigation program detailed in this chapter describes the existing pollution prevention programs in use at PHX which would be continued under the proposed project. As determined necessary and appropriate, the City will develop additional programs and procedures during of the design phase of the ADP Alternative to address unavoidable, non-significant environmental impacts resulting from ADP construction and/or operational activities. These measures are discussed in **Section 5.2** and **Section 5.3.** The City of Phoenix Aviation Department has committed to coordinate ADP construction activities with Federal, state, and local agencies, and perform construction activities in compliance with applicable environmental regulations.

The City currently participates in measures to minimize ongoing effects associated with operational activities at the airport. PHX has air quality emission reduction measures already in place which include the use of efficient layout and design of the runway/taxiway/terminal area systems enabling smooth, swift, and uninterrupted movements of aircraft from the runway ends to the terminal/cargo areas; thereby reducing fuel consumption and the resultant emissions. In addition, the airport layout provides for adequate capacity and efficient design of the landside infrastructure (e.g., access/egress roadways, terminal area curb front, and on-site parking facilities), which help to reduce excess emissions associated with slow-moving, idling, and roaming motor vehicles. Currently, the airport access/egress road (e.g., Sky Harbor Boulevard) provides for efficient circulation to, from, and circulating about the terminal areas; the short and long-term parking facilities are conveniently accessed; and the terminal building curb front remains uncongested. Layout and design efficiencies associated with the ADP would further improve traffic flow within the airport boundaries.

The City of Phoenix has a recycling program, "Phoenix Recycles," capturing as much material from the solid waste stream as possible. The Aviation Department currently participates in the recycling program and intends to continue to do so. CRInc's Phoenix Materials Recovery Facility (MRF) and the MRF at the 27th Avenue Solid Waste Management Facility help handle the amount of materials collected from all Phoenix serviced residences.

Section 5.2 describes potential pollution reduction measures to be considered during construction of the ADP Alternative. These measures are identified as possible methods to be used for the reduction of adverse impacts resulting from development of the ADP Alternative. Although any adverse impacts from implementation of the ADP Alternative would be non-significant and would reduce on-airport air emissions, **Section 5.3** describes the potential operational pollution reduction measures that could be

implemented by the City in addition to the existing programs currently in place. In all cases, the construction and operational pollution reduction measures would be implemented prior to or in conjunction with the realization of the actual impacts.

5.2 POTENTIAL CONSTRUCTION POLLUTION REDUCTION MEASURES

As an integral part of the ADP design and construction process, applicable state and local environmental construction controls will be examined to determine their effectiveness in reducing or eliminating impacts associated with construction of the ADP Alternative. The following sections describe potential construction pollution reduction measures associated with air quality, floodplains, hazardous substances, historic and archaeological resources, socioeconomics, and water resources.

5.2.1 AIR QUALITY

Air quality emission reduction measures for airports and aviation-related activities in general, and PHX in particular, are most effectively developed during the planning and design stages of the project. In this way, air emissions associated with the construction phase of the project can be minimized through the practical application of engineering, construction, and pollution-prevention techniques.

During the construction phases, potential short-term impacts to air quality can be avoided, controlled minimized, and/or compensated for by the adherence to the following measures including but not limited to:

- All construction activities shall be carried out in full compliance with the pollution control provisions and specifications contained in FAA Advisory Circular (AC) 150/5370-10B, *Standards for Specifying Construction of Airports*, the airport's AZPDES Construction General Permit, and/or requirements by Maricopa County dust control rules, and any local guidelines or ordinances.
- Any required air quality permits for land clearing, earth moving, open burning, asphalt and concrete batch plants, etc. would be obtained by the General Contractor or Subcontractor before the commencement of related activities. The City of Phoenix Aviation Department would oversee this activity and has certified in writing that the required permits would be obtained in accordance with state and local regulations.
- Stockpiles of soil, dirt, rocks, and other raw materials shall be covered or stabilized by the General Contractor or Subcontractor to help prevent the generation of wind-blown particles and debris (e.g., fugitive dust), consistent with the airport's AZPDES Permit.
- Heavily used work sites (e.g., construction staging areas, haul roads, loading/unloading platforms) shall be shielded, treated, or otherwise maintained by the General Contractor or Subcontractor, in compliance with Maricopa County dust rules, to help prevent the generation and release of dust.
- To the extent feasible, staged construction schedules would be employed by the General Contractor or Subcontractor that would help reduce the exposure of wind-erodable soils to minimal amounts and time periods.
- Construction equipment (e.g., earthmovers, haul trucks, excavators, etc.) to be properly maintained and cleaned, as necessary, by the General Contractor or Subcontractor to help minimize excess exhaust emissions.

- Temporary degradation in air quality due to emissions from construction equipment, fugitive dust from excavated areas, and earth moving operations will be minimized through the enforcement of the terms and conditions of Dust Control Permit that will be issued to the contractor by Maricopa County prior to approval for construction.

5.2.2 *FLOODPLAINS*

As required by FAA and Department of Transportation (DOT) orders, FAA will continue to work with state and local officials to finalize the design of the Automated People Mover System (APM) station to minimize potential harm to or within the base floodplain. Under local laws, the final design must be approved by Maricopa County and in the unlikely event that a significant (>1 foot) elevation change is predicted, the City would have to apply for a letter of map revision and design specific pollution reduction measures consistent with County requirements.

The ADP Alternative requires plans for the APM to be reviewed by the Maricopa County Flood Control District (MCFCD) with specific attention to the crossing of the Grand Canal. PHX would be required to show that a bridge design would safely accommodate the design flood, withstand the attendant inundation, and perform satisfactorily. PHX would also need to either demonstrate that the structures will be constructed outside of Zone A or avoid a one-foot change in the base flood elevation of the affected area.

The design of the Stage 2 APM and associated station would include consideration of methods to minimize floodplain impacts. This may include, but not be limited to, designing and placing piers and support infrastructure in a manner to minimize restrictions on the flow of flood waters and impacts to floodplain values; minimizing the amount of fill in the floodplain; and elevating facilities above the base flood elevation. Guidelines and regulations of the MCFCD would be followed in the final design of APM and the associated station. The permitting process required to construct this portion of the ADP Alternative would be initiated with the U.S. Army Corps of Engineers (USACE) and the Maricopa County Flood Control District during the final design phase. In addition, the design of the APM system would be coordinated with design efforts associated with the Valley Metro Light Rail station to be constructed at the intersection of 44th and Washington Streets. As documented in the Central Phoenix/East Valley Light Rail Transit FEIS, the light rail station will require construction in the floodplain. Potential impacts to the floodplain would be evaluated and mitigated in the future as the design of the station is developed.

5.2.3 *HAZARDOUS SUBSTANCES*

Construction of the ADP Alternative would be conducted in areas of the airport that are known to contain environmental contamination. These include two fuel plumes in the vicinity of the proposed West Terminal complex and crossfield taxiways. It is not anticipated that the existing plumes would substantially interfere with the construction process nor is it expected that the project would impede the clean-up process (Hughto, 2004). Construction plans and activities for the ADP Alternative would be developed, as appropriate, to prevent the spreading or migration of contaminants beyond the existing contaminant zones.

The potential risk to construction workers associated with exposures to petroleum-contaminated soils, groundwater, and fumes would be addressed in the planning and design process and construction

contract documents. During construction, work would be performed in accordance with the requirements of the Occupational Safety and Health Administration (OSHA). Any additional pollution reduction measures considered necessary to further reduce the impacts to the environment would be evaluated as the construction plans are developed.

Demolition of Terminal 2 would be complicated by the presence of large amounts of asbestos-containing materials (ACM). Removal and proper disposal of these materials would be required. Asbestos abatement activities would be performed in compliance with Section 112 of the Clean Air Act, Arizona Administrative Code R18-2-1101, and all other applicable Federal, state, and local regulations.

Should any additional and unexpected contaminated materials be encountered during the construction process, they would be addressed in accordance with Federal and state regulations. The use of hazardous materials (e.g., solvents, cleaners, coatings, paints, etc.) and other regulated substances (fuel, oil, hydraulic fluids, etc.) by the construction contractors could also be handled, stored, and disposed of following appropriate safeguards, guidelines, and work practices. As appropriate, spill prevention control and countermeasure (SPCC) plans would be developed for the handling and cleanup of potentially hazardous materials. Worker safety training would be conducted in accordance with OSHA 29 CFR 1926 requirements.

Any construction activities that involve disturbance of the surface have potential to expose and release previously unknown hazardous materials and wastes that may be located in the vicinity. In the event of a spill or unanticipated release of regulated materials including fuels, contractors will be required to cease work in the immediate area and report the release to the National Response Center (NRC). Special provisions will be included in the construction document to address the potential for encountering hazardous materials. All applicable Federal, state and local regulations will be followed for the cleanup and disposal of hazardous waste during construction activities. In addition, contractors will be required to maintain a "Spill Response Kit" on the project worksite. The kit would include items such as absorbent materials, absorbent pads, skimmer booms, shovels, and storage containers. These kits would be used to mitigate the spread of hazardous materials should a spill occur.

5.2.4 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The ADP Alternative project planning would continue and final designs would be prepared in accordance with procedures defined in the Section 106 Memorandum of Agreement (MOA) between the FAA, City of Phoenix, Bureau of Reclamation, Salt River Project, and State Historic Preservation Officer (SHPO) to address improvements at the airport (an unsigned copy of the MOA is contained within Appendix C of this FEIS). The City would arrange to have archaeological testing or monitoring plans prepared and implemented as those final designs provide more details about the components of the ADP Alternative. If archaeological resources are discovered, they would be evaluated and measures to avoid, reduce, or mitigate impacts to National Register-eligible resources would be developed and implemented. Treatment plans would be prepared and are most likely to focus on studies to recover and preserve important archaeological information before significant archaeological resources are disturbed or destroyed by ground-disturbing construction activities. If human remains and funerary objects, sacred objects, or objects of cultural patrimony were encountered in association with archaeological sites, they

would be treated and repatriated in accordance with a 1995 agreement that the City of Phoenix executed in compliance with the Arizona State Museum for tribes having traditional cultural affiliations within the Phoenix area. The agreement was developed to ensure that City of Phoenix projects are implemented in compliance with the Arizona Antiquities Act, which governs treatment of human remains and such objects found on lands owned or controlled by the City of Phoenix.

None of the buildings that would be demolished by implementation of the ADP Alternative are listed in or eligible for the National Register. However, *The Phoenix*, a mural by Paul Coze installed within the Terminal 2 lobby, is considered eligible for the National Register under Criterion C. The ADP Alternative would demolish Terminal 2 and replace it with a new West Terminal. The City would remove and preserve the mural prior to demolition of the terminal. In contrast to a historical building or structure, the mural is an inherently moveable object of art. The FAA, in consultation with the SHPO, has concluded that moving the mural and removing it in another public location at the airport would not adversely affect the historic values that make the mural eligible for the National Register. Before the Paul Coze mural is removed from Terminal 2, the mural would be photo-documented. The airport art curator would ensure that the mural is carefully removed to avoid damage to the multimedia mural. The Phoenix Aviation Department would remount the three panels of the mural together in an appropriate public location on the airport in a timely manner. The history of the mural would be documented and publicly interpreted when it is remounted. The FAA would consult the SHPO and Phoenix City Historic Preservation Officer (CHPO) as detailed plans for removing and remounting the mural are developed and implemented.

To specifically address potential visual effects on the Pueblo Grande Ruin and Irrigation Sites National Historic Landmark within the Pueblo Grande Museum and Archaeological Park, the FAA and Phoenix Aviation Department would work with the Museum Director, Phoenix CHPO, and SHPO in defining design criteria and reviewing developing designs of the Stage 2 - East APM station and maintenance facility. The FAA concluded, in consultation with the SHPO, that a sensitive design of the proposed facilities considering factors such as massing, style, color, texture, glare, and potential for screening with vegetation would have no adverse effect on the park. The project has potential to result in a beneficial effect by enhancing pedestrian access to the museum from the APM and Valley Metro Rail stations.

5.2.5 SOCIOECONOMIC

All acquisitions and relocations would be accomplished in accordance with the Uniform Relocation Assistance Real Property Acquisition Polices Act of 1970. This act establishes a standard process for Federally-approved or supported projects for relocation activities and requires fair market value to be paid for properties acquired plus relocation costs. Fair market values for properties to be acquired for airport expansion purposes would be determined by appraisal of comparable properties, including properties whose selling price would not be affected by ADP Alternative. Currently, as part of their ongoing noise mitigation program, PHX has a volunteer acquisition program working with property owners who currently want to sell their property. This program is being expanded to include properties within the APM Stage 2 right-of-way. In addition, PHX is working with business owners of the affected properties to evaluate means of providing assistance. A Maintenance of Traffic (MOT) plan could be developed during the design phase of the roadway project such that temporary traffic flow impacts would be minimized. During construction of the ADP projects, some lanes of Sky Harbor Boulevard could be closed at night from

approximately 10:00 p.m. to 6:00 a.m. to accommodate construction. All lanes would likely remain open during the day to minimize on-airport traffic impacts during times of normal and peak airport activity. As part of the APM Stage 2 design process, planning would also be initiated to address any street abandonments that may be required as part of the project implementation.

5.2.6 WATER RESOURCES

Temporary degradation of surface water quality from water turbidity that could occur during the construction period when excavated areas are exposed prior to paving would be mitigated by controls implemented prior to construction such as straw or baled hay barriers placed within turbidity curtains. Runoff of stormwater from the construction site will be controlled in accordance with the City of Phoenix Arizona Pollution Discharge Elimination System (AZPDES) Construction General Permit issued by the Arizona Department of Environmental Quality.

5.2.7 SOLID WASTE

The ADP Alternative would be developed in accordance with standards developed by the United States Secretary of Transportation. Minimization/preventative actions that might reduce or eliminate construction impacts (construction and demolition waste) include measures outlined in FAA AC 150/5370-10B, *Standards for Specifying Construction at Airports*. According to the AC, the City's contractor shall submit a plan for disposal of waste materials prior to the start of construction.

5.3 POTENTIAL OPERATIONAL POLLUTION REDUCTION MEASURES

This section contains the potential operational mitigation program for the FAA's preferred alternative. The following sections describe the ADP Alternative's potential operational pollution reduction measures associated with air quality, hazardous materials, water resources, and solid waste environmental impact categories.

5.3.1 AIR QUALITY

As documented in Chapter 4.0, Environmental Consequences, implementation of the ADP Alternative would result in a reduction of aircraft emissions at PHX due to increased operational efficiencies. As a result, mitigation to address air quality impacts associated with the proposed project may not be necessary. In an effort to continue to operate PHX is an environmentally sound manner, the City of Phoenix would however continue to utilize the air quality emission reduction measures currently in place, and those which are inherent to the planning process. The ADP Alternative is intended to optimize the airfield layout consistent with existing and future aviation demand, thereby reducing aircraft emissions. The proposed surface transportation improvements to Sky Harbor Boulevard would improve the efficiency of the on-airport roadway system. Avoidance, or minimization, of areas or structures (e.g., terminal buildings, parking structures, etc.), which contribute to zones of restricted air movement and create localized "hot-spots" of air pollution would be minimized or eliminated. The ADP Alternative would be designed to provide separation and placement of the primary support facilities (e.g., main terminal buildings) in a manner that helps prevent the build-up of pollutants. Creating open-space, or "buffer

zones", would provide distance between the air emission source locations (e.g., runway ends, taxiways, fuel facilities, parking garages) and any nearby potentially sensitive receptors (e.g., homes, schools, parks, etc.). Utilization of the Stage 2 APM system to access the RCC would reduce the number of passenger vehicles accessing the terminal areas, further reducing air emissions at the airport.

5.3.2 HAZARDOUS MATERIALS

Airport operations following development of the ADP Alternative are not expected to substantially alter the types of hazardous and other regulated materials used at the airport. The use of fuel and other regulated substances necessary for routine operations at the airport would continue and is expected to increase due to the forecasted growth in operations at the airport. The storage and use of these materials are governed by a wide network of Federal and state regulations. Operations at PHX are conducted in full compliance with these regulations. When used in combination with technologies currently in place at the airport and safe work practices, the risks of causing environmental contamination are reduced.

Any construction activities that involve disturbance of the surface have potential to expose and release previously unknown hazardous materials and wastes that may be located in the vicinity. In the event of a spill or unanticipated release of regulated materials including fuels, contractors will be required to cease work in the immediate area and report the release to the National Response Center (NRC). Special provisions will be included in the construction document to address the potential for encountering hazardous materials. All applicable Federal, state and local regulations will be followed for the cleanup and disposal of hazardous waste during construction activities.

5.3.3 WATER RESOURCES

Water quality for the City of Phoenix is regulated by a variety of permits and plans. All activities associated with development of the ADP Alternative would be performed in accordance with the airport's AZPDES and Multi-Sector General Permit (MSGP) requirements, appropriate state and Federal regulations and standards.

Water conservation can offset the increased water demand from the ADP Alternative. The City can participate in the conservation effort with regard to this project by implementing the following:

- Educate employees and tenants on correcting wasteful habits,
- Install water efficient plumbing fixtures, and
- Maintain plumbing fixtures and pipes to prevent leaks.

These permits, plans and conservation efforts, as described, have the potential to minimize water resource impacts associated with the ADP Alternative.

5.3.4 SOLID WASTE

PHX would continue with the City of Phoenix recycling efforts, "Phoenix Recycles", and work with local municipalities, businesses, and waste handlers to develop and implement source reduction strategies, resource recovery facilities, markets for recyclables, and waste to energy facilities to achieve a significant reduction in solid waste disposal volumes entering the landfill. CRInc's Phoenix MRF and the MRF at the 27th Avenue Solid Waste Management Facility could be utilized help reduce the amount of materials collected at PHX.

Chapter 6.0
Coordination and Public Involvement

CHAPTER 6.0
COORDINATION AND PUBLIC INVOLVEMENT

6.1 INTRODUCTION

A public involvement program was implemented to ensure that information was provided to the general public and public agencies from the earliest stages of project planning and that input from interested parties was received and reviewed throughout the Environmental Impact Statement (EIS) process. The primary components of the program included:

- Scoping Meetings (Agency and Public held on April 23, 2001),
- Public Workshop (October 16, 2002),
- Public Information Meetings (July 12th and 13th, 2005), and
- A Public Hearing following release of the DEIS (July 12th and 13th, 2005).

In addition, newspaper advertisements were used to inform the public of changes, progress, and status of the study. Keeping the public informed and obtaining their input was considered an integral part of the process. The following summarizes the public involvement process.

6.2 SCOPING MEETING

6.2.1 SCOPING NOTIFICATION

Notification of the scoping process for this EIS was accomplished in compliance with National Environmental Policy Act (NEPA) and Federal Aviation Administration (FAA) requirements. A variety of methods were used to inform agencies and the public about the EIS scoping process for the study.

Federal Register Notice of Intent - The FAA published a notice in the Federal Register on Monday, March 12, 2001 which included the Letter of Intent to prepare an EIS at Phoenix Sky Harbor International Airport (PHX). The Notice of Intent summarized the proposed developments and FAA's requirements under NEPA for preparation of an EIS. A copy of the notice is provided in **Appendix G**.

Advertisements - Advertisements announcing the FAA scoping process and providing notification of the scoping meetings were published in the local newspapers serving the study area on Saturday, April 14, 2001 and Saturday, April 21, 2001. Copies of the advertisements are provided in **Appendix G**.

6.2.2 SCOPING MEETINGS

Two scoping meetings were accomplished at the Holiday Inn Select Phoenix Airport on Wednesday, April 23, 2001 as part of the EIS scoping process for this study. An agency scoping meeting was held in the afternoon, which was followed by a public scoping meeting in the evening. Court reporters were present to record all testimony given in the two meetings. In addition, a PowerPoint presentation was shown, a handout was distributed, and presentation boards were displayed at both meetings that

summarized the proposed action as well as the scoping and EIS process. The handout is provided in Appendix G of this FEIS.

Agency Scoping Meeting - A scoping meeting specifically for Federal, state, and local governmental agencies was held at the Holiday Inn Select Phoenix Airport on Wednesday, April 23, 2001 between the hours of 1:00 p.m. and 3:00 p.m. The meeting was presided over by the FAA. A total of 16 people signed in at the meeting. The scoping meeting was preceded by a brief presentation by the FAA on the proposed project and the NEPA process after which a question and answer session was held. Comment forms were available for participants to submit written comments either at the meeting or by mail to the FAA Project Manager by May 14, 2001.

Media Briefing - An informal scoping meeting specifically for the media was held at the Holiday Inn Phoenix Airport on Wednesday, April 23, 2001 between the hours of 4:00 p.m. and 4:45 p.m. A total of 3 people signed in at the meeting. The media briefing began with a PowerPoint presentation of the scoping process and the proposed action by the FAA. Following the presentation, the media was invited into an adjoining room where numerous presentation boards were available for public review.

Public Scoping Meeting - An informal format scoping meeting specifically for the general public was held at the Holiday Inn Phoenix Airport on Wednesday, April 23, 2001 between the hours of 5:00 p.m. and 8:00 p.m. A total of 6 people signed in at the meeting. The scoping meeting began with a PowerPoint presentation of the Scoping process and the proposed action by the FAA. Following the presentation, the public was invited into an adjoining room where numerous presentation boards were available for public review.

Representatives of the FAA, the City of Phoenix Aviation Department, and the FAA's consultant team were also available to discuss the Scoping Process, and the proposed action, as well as to answer any questions from the public. Comment forms were available for participants to submit written comments either at the meeting or by mail to the FAA Project Manager by Monday, May 14, 2001. In addition, three court reporters were present to take verbatim comments from any person attending the meeting.

6.3 PUBLIC NOTIFICATION

6.3.1 MAILING LISTS

A mailing list was compiled and utilized over the duration of the project to distribute notices of public participation activities. The list consisted of Federal agencies, State of Arizona elected officials and agencies, Maricopa County officials, local organizations, and individuals that attended the public workshop or requested to be on the mailing list.

6.3.2 MEDIA COORDINATION

To reach a wider audience, a media list was compiled and utilized to send press releases and newspaper advertisements announcing public participation events. Newspaper advertisements were published in the *Arizona Republic, Arizona Business Gazette, and LaVoz* newspapers prior to the public information meetings and public hearings.

6.4 PUBLIC WORKSHOP/INFORMATION MEETING

6.4.1 OCTOBER 16, 2002

A public workshop on the proposed project was conducted on October 16, 2002. The workshop was held between 5:00 p.m. and 8:00 p.m., at the Holiday Inn Select Phoenix Airport. The workshop was intended to inform the public about the EIS process and the project status, receive comments, and respond to questions.

The workshop was conducted in an informal, open-house format. A variety of methods were used to provide information to the public including board-mounted graphics and handouts. Airport representatives and the consultant team were available for one-on-one discussions with the public. **Appendix G** provides information about the workshop, including notification materials and sign-in sheets.

There were 9 registered participants at the workshop. The subjects covered during this workshop included an overview of the EIS process, project description, project purpose and need, alternatives, and general discussions concerning environmental impact categories (i.e., noise, air quality, etc) to be evaluated as part of the EIS.

6.4.2 JULY 12TH AND 13TH, 2005

Public information meetings on the DEIS were conducted on July 12th and 13th, 2005 at the Phoenix Airport Marriott and Wesley Community Center, respectively. The information meetings were held between 5:00 p.m. and 9:00 p.m. Advertisements for the information meetings were published in the *Arizona Republic, Arizona Business Gazette, and LaVoz* newspapers.

The public information meeting was conducted in an informal, open-house format. A variety of methods was used to provide information to the public including board-mounted graphics and handouts. Subjects covered during the public information meetings included an overview of the EIS process, the Proposed Project, purpose and need of the project, potential alternatives, and discussions concerning environmental impact categories (i.e., noise, air quality, etc) evaluated in the DEIS. Airport representatives and the consultant team were available for one-on-one discussions with the attending participants to receive and respond to comments and questions.

There were 19 registered participants at the July 12th meeting and 5 registered participants at the July 13th meeting. **Appendix G** provides information about the public information meetings, including notification materials, sign-in sheets, handouts, comment forms, and speaker registration.

6.5 DEIS AVAILABILITY FOR REVIEW

The DEIS was available for review by the public for a period of 45 days (June 10, 2005 to July 26, 2005). Notification of the document's availability was accomplished through advertisements and press releases in the local media. The document was made available for review at the locations listed in **Chapter 7.0**. Anyone wishing to comment on the DEIS was provided an opportunity to do so either in writing during the 45-day review period or in person at the public hearing. The DEIS was also distributed to Federal, state,

and local agencies which have jurisdictional responsibility or an interest in the study. The list of these agencies is also provided in Chapter 7.0. These agencies had a period of 45 days to respond on the DEIS.

Based on a request from a local agency, FAA extended the comment period for the DEIS for the proposed improvements at PHX from July 26, 2005 to August 10, 2005. Advertisements were placed in local newspapers to inform the general public and other interested parties. This extension provided agencies and the public with an additional 15 days to review the DEIS.

FAA responded to all reasonable comments received from the public and agencies on the DEIS during the review period. Summaries of the comments received, responses, and any necessary revisions to the EIS have been published in this FEIS.

6.6 PUBLIC HEARING

Public hearings on the DEIS were conducted on July 12th and 13th, 2005 at the Phoenix Airport Marriott and Wesley Community Center, respectively. The public hearings occurred from 6:00 p.m. to 9:00 p.m. Advertisements for the hearings were published in the *Arizona Republic, Arizona Business Gazette, and LaVoz* newspapers.

The public hearings provided agencies and the public an opportunity to provide comments directly to the FAA representative. The public hearing was presided over by a hearing officer and recorded via a certified court reporter. A Spanish/English interpreter was also available to attendees as necessary.

There were 19 registered participants at the July 12th hearing and 5 registered participants at the July 13th hearing. Appendix G provides information about the public hearings, including notification materials, sign-in sheets, and speaker registration.

6.7 FEIS AVAILABILITY FOR REVIEW

The appendices of the DEIS have been expanded to include summaries of the comments received during the review period and responses to those comments. The body of the report has been updated as necessary to reflect comments received. According to FAA Order 1050.1E, FAA can make a final decision to act no sooner than 30 days after the EPA notice of availability is published in the Federal Register. At the conclusion of the waiting period, FAA issues the final decision in a Record of Decision (ROD).

Chapter 7.0
List of Preparers, List of Parties to Whom Sent

CHAPTER 7.0
LIST OF PREPARERS, LIST OF PARTIES TO WHOM SENT

7.1 LIST OF PREPARERS

As required by Federal Aviation Administration (FAA) Order 5050.4A, par. 77, the names and qualifications of the principal persons contributing information to this Environmental Impact Statement (EIS) are identified. It should be noted that, in accordance with Section 1502.6 of the Council on Environmental Quality (CEQ) regulations, the efforts of an interdisciplinary team, consisting of technicians and experts in various fields, were required to accomplish this study. Specialists involved in this EIS included those in such fields as airport planning; air traffic control; noise assessment and abatement; land use planning; air pollution; biology; historic, architectural, and archaeological resources; and other disciplines. It should also be noted that, while an interdisciplinary approach has been used, all decisions made with regard to the content and scope of this EIS are those of the FAA.

FEDERAL AVIATION ADMINISTRATION - LEAD AGENCY

David Kessler, AICP - Environmental Protection Specialist, Airports Division, Western-Pacific Region. B.A. Physical Geography (Geology Minor), M.A. Physical Geography. 26 years experience. Responsible for overall preparation and coordination of federal environmental disclosure documents for the Airports Division, Western-Pacific Region.

Jennifer Mendelsohn - Environmental Protection Specialist, Airports Division, Western-Pacific Region. B.S. Environmental Science, M.A. Environmental Management. 9 years experience. Responsible for detailed FAA evaluation of all parts of the Draft and Final EIS as well as coordination of comments from various federal and state agencies.

URS CORPORATION - PRIME CONSULTANT

URS served as the prime contractor to assist the FAA in the preparation of the EIS.

Laddie Irion - Project Director. B.A. Biology. 25 years experience. Consultant Project Director responsible for overall supervision of the Consultant Team.

Paul Behrens - Project Manager. M.S. Biology, B.S. Marine Science. 25 years experience in environmental assessment and impact analyses. Responsible for project administration and coordination. Task manager for Purpose and Need, Alternatives, and quality assurance/quality control.

Allan Nagy - QA/QC Manager. B.S. Marine Biology/Chemistry. 24 years experience in environmental assessment and impact analysis. Responsible for quality assurance/quality control.

David Alberts - Project Coordinator. B.A. Geography. 8 years experience. Responsible for cumulative impacts, light emission, farmland, and solid waste impacts, public involvement and task manager of document coordination.

Don Shanfelt, PhD - 36 years experience. Project Coordinator (URS Phoenix). Task manager for biology, water resources, cultural/historical, socioeconomics, and environmental justice assessments.

Michael Thompson, AICP - Senior Airport Planner. B.S. Air Commerce, M.B.A.. 21 years experience in airport planning. Assisted with the Purpose and Need and Alternatives chapters.

Michael Kenney, Q.E.P, C.H.M.M. - Senior Environmental Specialist. B.A. Environmental Science, M.S. Environmental Engineering. 26 years experience. Responsible for quality assurance/quality control of air quality assessment and hazardous materials section.

Alan D. Goldman – Senior Air Quality Specialist. BS Meteorology. 31 years experience. Qualified Environmental Professional. Responsible for Air Quality impact assessments.

Deborah Murphy - B.S. Ocean Engineering, M.S. Engineering. 22 years experience. Noise Specialist. Task Manager for noise modeling/analysis and quality assurance/quality control of land use.

Cindy Smith - B.S. Liberal Arts and Sciences. 29 years experience. Responsible for resource coordination.

Debbie Wilson - Air Quality Specialist. B.S. Meteorology, M.S. Meteorology. 13 years experience. Responsible for air quality assessment.

Susumu Shirayama - Airport Environmental Planner. B.S. Aerospace Studies. 5 years experience in aviation environmental impact analysis. Responsible for noise impact analysis.

Court Morgan - Project Coordinator (URS Phoenix). Task manager for biology, water resources, cultural/historical, socioeconomics, and environmental justice assessments.

A.E. (Gene) Rogge - Cultural Resource Task Manager. Ph.D. Anthropology. 31 years experience. Principal investigator for archaeological and cultural resources.

Danny Rakestraw - Project Biologist. B.S. Wildlife Ecology, M.S. Ecology. 16 years experience. Responsible for biological resources, threatened and endangered species, and wetlands.

Mark Murphy - Principal Investigator, Water Resources. PhD Geology, 27 years experience. Responsible for floodplains, surface and ground water quality and quantity and storm water management descriptions and impact analysis.

Kirsten Erickson - Historian. B.A. History, M.A. Public History and U.S. History. 8 years experience. Responsible for cultural resource impacts.

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Sunny Bush - Environmental Planner. B.A. Liberal Arts and Sciences, M.T. Hazardous Materials Management. 13 years experience. Assisted with the socioeconomics and environmental justice sections.

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Chapter 9.0
Abbreviations, Acronyms, Glossary

CHAPTER 9.0
LIST OF ABBREVIATIONS, ACRONYMS, AND GLOSSARY

9.1 LIST OF ABBREVIATIONS AND ACRONYMS

A

AAGR	Average Annual Growth Rate
AC	Advisory Circular
ACM	Asbestos Containing Material
ADA	Americans with Disabilities Act
ADEQ	Arizona Department of Environmental Quality
ADG	Airplane Design Group
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AESF	Arizona Ecological Service Field Office
AFFC	Arizona Fueling Facilities Corporation
AGFD	Arizona Game and Fish Department
AGL	Above Ground Level
AIP	Airport Improvement Program
ALP	Airport Layout Plan
ANG	Air National Guard
AOD	Area of Disturbance
APM	Automated People Mover
APU	Auxiliary Power Unit
AQD	Air Quality Department
ARC	Aircraft Reference Codes
ARFF	Airport Rescue and Fire Fighting
ARTCC	Air Route Traffic Control Center
AST	Aboveground Storage Tank
ATADS	Air Traffic Activity Data System
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
AZPDES	Arizona Pollution Discharge Elimination System

B

bgs	Below Ground Surface
bls	Below Land Surface
BMP	Best Management Practices

C

CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAP	Central Arizona Project
CBD	Central Business District
CBRA	Coastal Barrier Resources Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
CHD	Chandler Municipal Airport
CHPO	City Historic Preservation Officer
CO	Carbon Monoxide
CWA	Clean Water Act
CZMA	Coastal Zone Management Act

D

dB	Decibels
dBA	Decibels A-weighted
DCR	Design Concept Report
DNL	Day-Night Equivalent Sound Level (See also Ldn)
DOA	Department of Aviation
DOI	Department of the Interior
DOT	Department of Transportation
DP	Departure Procedure
DSA	Detailed Study Area
DVT	Phoenix Deer Valley Airport

E

EA	Environmental Assessment
EDMS	Emissions and Dispersion Modeling System
EEPG	East Economy Parking Garages
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act

F

°F	Degrees Fahrenheit
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FBO	Fixed Base Operator
FEMA	Federal Emergency Management Agency
FFZ	Falcon Field Airport
FHWA	Federal Highway Administration
FIP	Federal Implementation Plan
FIRM	Flood Insurance Rate Map
FIS	Federal Inspection Services
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Authority
FY	Fiscal Year

G

GEU	Glendale Municipal Airport
GIS	Geographic Information System
gpm	Gallons per Minute
GPS	Global Positioning System
GRIC	Gila River Indian Community
GSA	Generalized Study Area
GSE	Ground Service Equipment
GYR	Phoenix-Goodyear Airport

H

HC	Hydrocarbon
HDMS	Heritage Data Management System
HIRL	High Intensity Runway Lights
HUD	U.S. Department of Housing and Urban Development

I

ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
ILS	Instrument Landing System
INM	Integrated Noise Model
IWA	Williams Gateway Airport

L

LAWA	Los Angeles World Airports
Ldn	Day-Night Equivalent Sound Level
LOS	Level of Service
LRT	Light Rail Transit
LTO	Landing and Takeoff Cycle
LUF	Luke Air Force Base
LUST	Leaky Underground Storage Tank
LWCF	Land and Water Conservation Fund

M

MAG	Maricopa Association of Governments
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lighting System
MCESD	Maricopa County Environmental Services Department
MCFCD	Maricopa County Flood Control District
mgd	Million Gallons per Day
MRF	Materials Recycling Facility
MSA	Metropolitan Statistical Area
MSGP	Multi-Sector General Permit
MSL	Mean Sea Level
MSW	Municipal Solid Waste
MUTCD	Manual on Uniform Traffic Control Devices

N

N/A	Not Applicable
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NM	Nautical Mile (6,076 feet)
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_3	Nitrate Radical
NO_X	Nitrogen Oxides
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPIAS	National Plan of Integrated Airport Systems
NPL	National Priorities List
NPS	National Parks Service
NRCS	National Resource Conservation Service

O

O_3	Ozone
O&D	Origin and Destination

P

PAPI	Precision Approach Path Indicator System
Pb	Lead
PHX	Phoenix Sky Harbor International Airport
PM	Particulate Matter
ppm	Parts per Million

R

RACM	Regulated Asbestos Containing Material
RASP	Regional Aviation System Plan
RCC	Rental Car Center
REIL	Runway End Identifier Lights
ROD	Record of Decision
ROP	Rate of Progress

S

SCS	Soil Conservation Service
SDL	Scottsdale Airport
SEL	Sound Exposure Level
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SR	State Road
SRP	Salt River Project
SSA	Socioeconomic Study Area
STAR	Standard Terminal Arrival Route
SWPPP	Stormwater Pollution Prevention Plan

T

TAF	Terminal Area Forecast
TAMIS	Total Airport Management Information System
TIP	Transportation Improvement Program
TOFA	Taxiway Object Free Area
TRACON	Terminal Radar Approach Control
tpy	Tons per Year
TSA	Taxiway Safety Area
TSA	Transportation Safety Administration

U

USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank

V

VASI	Visual Approach Slope Indicator
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds

W

WWTP	Wastewater Treatment Plant

9.2 GLOSSARY OF TERMS

A-Weighted Sound Level (dBA) - A measurement representing a sound generally as the human ear hears it by filtering out as much as 20 to 40 decibels of sound below 100 hertz (Hz). Used for aircraft noise evaluations.

Base Floodplain - That area subject to a one percent or greater chance of flooding in any given year (i.e., the 100-year floodplain).

Baseline Condition - The existing conditions or conditions prior to future development, which serve as a foundation for analysis.

Best Management Practices (BMPs) - Methods employed during construction and included in the development for ensuring environmental management to the greatest possible extent.

Day-Night Equivalent Sound Level (DNL or Ldn) - The average sound level over a 24-hour period with noise events occurring between the hours of 2200 and 0700 subject to a penalty of 10 decibels.

Decibel (dB) - A unit of noise level representing a relative quantity. This reference value is a sound pressure of 20 micronewtons per square meter.

dBA - A weighted sound level. The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear.

Enplane - To board an airplane. Number of enplanements refers to the number of passengers boarding aircraft.

Federal Aviation Regulations (FAR) - Series of rules and regulations administered by FAA that govern the operation, maintenance, construction, acquisition, etc. of airports, aircraft, and associated aviation activities.

Flight Track Utilization - The use of established routes for arrival and departure by aircraft to and from the existing runways at the airport.

Integrated Noise Model (INM) - A computer model developed and maintained by FAA to predict the noise impacts generated by aircraft operations.

Land Use Compatibility - The ability of land uses surrounding the airport to co-exist with airport-related activities with minimum conflict.

Landing and Takeoff (LTO) Cycle - The time that an aircraft is in operation at an airport. An LTO cycle begins when an aircraft starts its final approach (arrival) and ends after the aircraft has made its climb-out (departure).

Mitigation Measures - Controls that are used to lessen the environmental impacts of a proposed development action.

National Ambient Air Quality Standards (NAAQS) - Standards established by the EPA used for protecting and improving air quality.

National Pollution Discharge Elimination System (NPDES) - Federal permit required by the EPA for point source and non-point source stormwater discharges.

Noise Contour - An outline graphically displayed on a plan or map identifying the limits of an area exposed to a specific sound level (example: 65 DNL noise contour).

Operational Demand - The need of an airport to adequately accommodate the existing or forecast level of aircraft operations.

Passenger Facility Charge (PFC) - A tax on enplaning passengers that may be used to supplement local airport revenues to fund needed airport development without a direct charge imposed on passengers by the airport proprietor.

Peak Hour - The hour of the day during which the greatest amount of aviation activity occurs.

Terminal Radar Approach Control (TRACON) - A terminal air traffic control facility collocated with an air traffic control tower. It uses radar data acquisition and air/ground communication equipment to provide approach and departure traffic control services under Instrument Flight Rule conditions.

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